HORTICULTURAL REPORT

2009 WEED CONTROL RESEARCH ON FRUIT & VEGETABLE CROPS

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WEED CONTROL IN HORTICULTURAL CROPS – 2009
FORWORD

This report summarizes the results of weed control experiments on horticultural crops in Michigan in 2009. It is intended to inform industry and university research and extension colleagues of our current results.

We greatly appreciate the support for our weed control research and extension program from commodity groups, chemical companies, MSU Extension, and the Michigan Agricultural Experiment Station. The following companies and organizations provided financial support, chemicals, equipment, seeds, plants, research sites, or other support for our program:

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METHODS

Chemical Application

Herbicides were applied with a small plot sprayer using carbon dioxide as a source of pressure. Spray volumes are specified in each experiment. All herbicide rates are expressed as pounds of active ingredient per acre.

Visual Evaluations

In most instances, weed control ratings were made on individual weed species. General ratings for broad-leaved weeds and grasses were sometimes used in orchard studies or for late-season assessments.

Weed control and crop injury are rated on a 1 to 10 scale; 1 = no visible injury or reduction in growth; 10 = complete kill of plants. The ratings can be roughly translated into percentages as follows:

10 = 100% kill, all the plants are dead or none are visible.
9 = 90-100% kill or reduction in growth and stand.
8 = 80-90% kill or reduction in growth and stand.
7 = 70-80% kill or reduction in growth and stand.
This is a still commercially acceptable control.
6 = 60-70% kill or reduction in growth and stand.
5 = 50% kill or reduction in growth and stand.
4 = 30-40% kill or reduction in growth and stand.
3 = 20-30% reduction in growth and stand.
2 = 10-20% reduction in growth and stand.
1 = 0-10% reduction in growth, no obvious effect of herbicide.

Experimental Design and Statistical Analysis

Experiments were set up and analyzed in the program Agriculture Research Manager (ARM) version 7.3.6, from Gylling Data Management, Inc. (RR 4 405 Martin Boulevard, Brookings, SD 57006). Unless otherwise specified, the experiments were laid out as randomized complete blocks. The data were subjected to analysis of variance and the means were compared with the LSD test at the 5% level. Since data transformations were not used, the coefficient of variation for skewed ratings or weed densities may be misleading. In some instances, yields for weeded check plots may be low because of severe early weed competition. In these cases, it may be more desirable to compare new herbicides with standard treatments.

WEED LIST

Abbreviations for the common names of weeds correspond to those presented in the NCWSS proceedings volume 28 (1973), 143.

Abbr.	Common Name	Botanical Name
ALFA	alfalfa	*Medicago sativa*
ANBG	annual bluegrass	*Poa annua* L.
ANFB	annual fleabane	*Erigeron annuus (L.) Pers.*
ATRI	Atriplex	*Atriplex patula L. (Gray)*
BABR	bald brome (upright brome)	*Bromus racemosus* L.
BFTF	birdsfoot trefoil	*Lotus corniculatus* L.
BHPL	buckhorn plantain	*Plantago lanceolata* L.
BLDO	broadleaf dock	*Rumex obtusifolius* L.
BLME	black medic	*Medicago lupulina* L.
BRFB	British fleabane	*Inula britannica* L.
BRPL	broadleaf plantain	*Plantago major* L.
BSPL	blackseed plantain	*Plantago rugelii* Dcne.
BYGR	barnyardgrass	*Echinochloa crus-galli* (L.) Beauv.
CABR	California brome	*Bromus carinatus* L.
CATH	Canada thistle	*Cirsium arvense* (L.) Scop.
CAWE	carpetweed	*Mollugo verticillata* L.
CLGC	clammy groundcherry	*Physalis heterophylla* Nees.
COBU	cocklebur	*Xanthium strumarium* L.
COCW	common chickweed	*Stellaria media* (L.) Cyrillo
COGR	common groundsel	*Senecio vulgaris* L.
COLQ	common lambsquarters	*Chenopodium album* L.
COMW	common milkweed	*Asclepias syriaca* L.
COPU	common purslane	*Portulaca oleracea* L.
COPW	common pokeweed	*Phytolacca americana* L.
CORW	common ragweed	*Ambrosia artemisiifolia* L.
CUDO	curly dock	*Rumex crispus* L.
CWBS	catchweed bedstraw	*Galium aparine* L.
DAND	Dandelion	*Taraxacum officinale* Weber
DOBG	downy bromegrass	*Bromus tectorum* L.
EBNS	eastern black nightshade	*Solanum ptycanthum* Dun.
FAPA	fall panicum	*Panicum dichotomiflorum* Michx.
FIBW	field bindweed	*Convolvulus arvensis* L.
FIPA	field pansy	*Viola rafinesquii* Greene
FIPC	field pennycress	*Thlaspi arvense* L.
FISB	field sandbur	*Cenchrus incertus* M.A.Curtis
GIRW	giant ragweed	*Ambrosia trifida* L.
GOGR	goosegrass	*Eleusine indica* (L.) Gaertn.
GORO	goldenrod	*Solidago nemoralis* Ait.
GIFT	giant foxtail	*Setaria faberi* Hermm.
GRFT	green foxtail	*Setaria viridis* (L.) Beauv.
GFPW	greenflower pepperweed	*Lepidium densiflorum* Schmd.
HANS	hairy nightshade	*Solanum sarrachoides* Sendtner
HOAL	hoary alyssum	*Berteroa incana* (L.) DC.
HONE	horsenettle	*Solanum carolinense* L.
HOWE	horseweed (marestail)	*Conyza canadensis* (L.) Scop.
IRFB	Irish fleabane	*Inula salicina*
JIWE	jimsonweed	*Datura stramonium* L.
LACG	large crabgrass	*Digitaria sanguinalis* (L.) Scop
LATH	ladysthumb	*Polygonum persicaria* L.
MATA	marestail (horseweed)	*Conyza canadensis* (L.) Scop.
MAYC	marsh yellowcress	*Rorippa islandica* (Oeder) Barbs

WEED LIST

Abbr.	Common Name	Botanical Name
MECW	mouseear chickweed	*Cerastium vulgatum* L.
MECR	mouseear cress	Arabidopsis thaliana(L.) Heynh
MONO	monolepis	*Monolepis nuttaliane* Greene
MWCH	mayweed chamomile	*Anthemis cotula* L.
NLLQ	narrowleaf lambsquarters	*Chenopodium desiccatum* A. Nels
OEDA	oxeye daisy	*Chrysanthemum leucanthemum* L.
ORGR	orchardgrass	*Dactylis glomerata* L.
PAWE	pineappleweed	*Matricaria matricariodes* (Less)C.L.Porter
PESW	Pennsylvania smartweed	*Polygonum pennsylvanicum* L.
PERG	perennial ryegrass	*Lolium perenne* L.
POIV	poison ivy	*Rhus radicans* L.
PRKW	prostrate knotweed	*Polygonum aviculare* L.
PRLE	prickly lettuce	*Lactuca serriola* L.
PRSP	prostrate spurge	*Euphorbia maculata* L.
PRPW	prostrate pigweed	*Amaranthus blitoides* S. Wats.
PUDN	purple deadnettle	*Lamium purpureum* L.
PUSW	purslane speedwell	*Veronica serpyllifolia* L.
PUVI	puncturevine	*Tribulus terrestris* L.
QUGR	quackgrass	*Agropyron repens* (L.) Beauv.
RECL	red clover	*Trifolium pratense* L.
REFE	red fescue	*Festuca rubra* L.
RESO	red sorrel	*Rumex acetosella* L.
ROFB	rough fleabane	*Erigeron strigosus* Muhl. ex Willd.
RRPW	redroot pigweed	*Amaranthus retroflexus* L.
RSFI	redstem filaree	*Erodium cicutarium* (L.) L'Hér. ex Ait.
RUTH	Russian thistle	*Salsola iberica* L.
SHPU	shepherdspurse	*Capsella bursa-pastoris* (L.) Medic.
SPKW	spotted knapweed	*Centaurea biebersteinii* DC.
STGR	stinkgrass	*Eragrostis cilianensis* (All.) E. Mosher
SWSW	swamp smartweed	*Polygonum coccineum* Muhl. ex Willd.
TAFE	tall fescue	*Festuca arundinacea* Schreb.
TLSW	thymeleaf sandwort	*Arenaria serpyllifolia* L.
TUPW	tumble pigweed	*Amaranthus albus* L.
VELE	velvetleaf	*Abutilon theophrasti* Medic.
VICR	Virginia creeper	*Parthenocissus quinquefolia* (L.) Planch.
VIPW	Virginia pepperweed	*Lepidium virginicum* L.
VOAS	volunteer asparagus	*Asparagus officinalis* L.
WESA	western salsify	*Tragopogon dubius* Scop.
WHCA	white campion	*Silene latifolia Poir.*
WHCL	white clover	*Trifolium repens* L.
WIBW	wild buckwheat	*Polygonum convolvulus* L.
WICA	wild carrot	*Daucus carota* L.
WICH	wild chamomile	*Matricaria chamomilla* L.
WIGR	witchgrass	*Panicum capillare* L.
WIMU	wild mustard	*Sinapis arvensis* L.
WIRA	wild radish	*Raphanus raphanistrum* L.
WLDGRP	wild grape	*Vitis* sp.
WLDRASP	wild raspberry	*Rubus* sp.
YEFC	yellow fieldcress (kiek)	*Rorippa sylvestris* L.
YEFT	yellow foxtail	*Setaria glauca* (L.) Beauv.
YEHW	yellow hawkweed	*Hieracium caespitosum Dumort.*
YENS	yellow nutsedge	*Cyperus esculentus* L.
YERO	yellow rocket	*Barbarea vulgaris* R. Br.

CHEMICAL LIST

COMMON NAME	TRADE NAME	FORMULATION	MANUFACTURER
2,4-D amine	Weedar 64	3.8 L	Nufarm Inc.
acetochlor	Harness	7.0 E	Monsanto
acetochlor	Surpass	6.4 E	Dow Agrosciences
acifluorfen	Ultra Blazer	2 L	United Phosphorus
atrazine	Aatrex	4 L	Syngenta
bensulide	Prefar	4 EC	Gowan
bentazon	Basagran	4 L	Arysta
bromoxynil	Buctril	4 EC	Bayer CropScience
carfentrazone	Aim	2.0 EC	FMC
chlorimuron-ethyl	Classic	25 WDG	DuPont
clethodim	Intensity One	0.97 EC	UAP
clethodim	Select Max	0.97 EC	Valent
clomazone	Command	3 ME	FMC
clopyralid	Clopyr Ag	3 L	United Phosphorus
clopyralid	Stinger	3 EC	Dow Agrosciences
cloransulam-methyl	Firstrate	84 WDG	Dow Agrosciences
cycloate	Ro-Neet	6 EC	Helm Agro
dicamba	Clarity	4 L	BASF
diclobenil	Casoron G	4 G	Chemtura
diflufenzopyr 21.4% + dicamba 55%	Distinct	76.4 WG	BASF
dimethenamid-p	Outlook	6 EC	BASF
diquat	Reglone	2 EC	Syngenta
diuron	Karmex	80 DF	DuPont
EPTC	Eptam	7 EC	Gowan
ethalfluralin	Curbit	3 EC	UAP
ethalfluralin 1.6 lb ai + clomazone 0.5 lb ai	Strategy	2.1 EC	UAP
ethofumesate	Nortron SC	4 SC	Bayer CropScience
fluazifop-P	Fusilade DX	2 EC	Syngenta
flucarbazone	Everest	70 WDG	Arysta
flufenacet	Define	60 DF	Bayer CropScience
flufenacet 54.4% + metribuzin 13.6%	Axiom	68 DF	Bayer CropScience
flumetsulam	Python	80 WDG	Dow Agrosciences
flumioxazin	Chateau	51 WDG	Valent
flumioxazin	Valor	51 WG	Valent
fluroxypyr	Starane Ultra	2.8 L	Dow Agrosciences
fomesafen	Reflex	2 EC	Syngenta
fomesafen 10.2% + s-metolachlor 46.4%	Prefix	5.29 L	Syngenta
foramsulfuron	Option	35 WG	Bayer CropScience
glufosinate	Rely 200	1.67 L	Bayer CropScience
glufosinate	Liberty	1.67 EC	Bayer CropScience
glyphosate	Roundup Weath. Max	5.5 L	Monsanto
glyphosate	Touchdown Total	4.17 L	Syngenta
glyphosate	Roundup Original	4 L	Monsanto
glyphosate	Roundup Ultra	4 L	Monsanto

CHEMICAL LIST

COMMON NAME	TRADE NAME	FORMULATION	MANUFACTURER
glyphosate	Roundup Ultramax	5 L	Monsanto
halosulfuron	Permit	75 WG	Gowan
halosulfuron	Sandea	75 WG	Gowan
hexazinone	Velpar ULV	75 SG	DuPont
imazamox	Raptor	1 AS	BASF
imazapic	Plateau	70 WG	BASF
imazethapyr	Pursuit	2 EC	BASF
imazosulfuron	V 10142	75 WDG	Valent
indaziflam	BCS AA10717	1.67 CS	Bayer CropScience
isoxaben	Gallery	75 DF	Dow Agrosciences
linuron	Lorox	50 DF	DuPont
mesotrione	Callisto	4 SC	Syngenta
metribuzin	Sencor	75 DF	Bayer CropScience
napropamide	Devrinol	50 DF	United Phosphorus
norflurazon	Solicam	80 DF	Syngenta
oryzalin	Surflan	4 AS	United Phosphorus
oxyfluorfen	Goal XL	2 L	Dow Agrosciences
oxyfluorfen	Goaltender	4 SC	Dow Agrosciences
paraquat	Firestorm	3 L	Chemtura
paraquat	Gramoxone Inteon	2 L	Syngenta
pendimethalin	Prowl	3.3 EC	BASF
pendimethalin	Prowl H2O	3.8 ACS	BASF
phenmedipham	Spin-Aid	1.3 L	Bayer CropScience
phenmedipham 0.6 lb ai+ desmedipham 0.6 lb ai+ prometryn	Betamix	1.3 L	Bayer CropScience
	Caparol	4 L	Syngenta
pronamide	Kerb	50 WP	Dow Agrosciences
propachlor	Ramrod	4 L	Monsanto
pyraflufen-ethyl	PCC 1195	0.2 EC	UAP
pyrazon	Pyramin	68 DF	Arysta
quizalofop p-ethyl	Assure II	0.88 EC	DuPont
quizalofop p-ethyl	Targa	0.88 EC	Gowan
rimsulfuron	Matrix	25 DF	DuPont
rimsulfuron	Pruven	25 DF	MANA
saflufenacil	Treevix	70 WG	BASF
sethoxydim	Poast	1.53 EC	BASF
simazine	Princep	90 DF	Syngenta
s-metolachlor	Dual Magnum	7.62 EC	Syngenta
s-metolachlor 2.68 lb ai+ mesotrione 0.268 lb ai+ atrazine 1.0 lb ai	Lumax	3.948 L	Syngenta
s-metolachlor 3.34 lb ai+ mesotrione 0.33 lb ai	Camix	3.67 L	Syngenta
s-metolachlor II	Dual II Magnum	7.64 EC	Syngenta
sulfentrazone	Spartan	4 F	FMC
sulfosulfuron	Maverick	75 WG	Monsanto
tembotrione	Laudis	3.5 SC	Bayer CropScience
terbacil	Sinbar	80 WP	TKI

CHEMICAL LIST

COMMON NAME	TRADE NAME	FORMULATION	MANUFACTURER
topramezone	Impact	2.8 L	Amvac
triclopyr	Garlon	3 SC	Dow Agrosciences
trifloxysulfuron	Envoke	75 WG	Syngenta
trifluralin	Treflan	4 EC	Dow Agrosciences
triflusulfuron	Upbeet	50 WDG	DuPont

ADJUVANTS

TRADE NAME	ABBREVIATION	DESCRIPTION	MANUFACTURER
Activator 90	NIS	nonionic surfactant	Loveland
ammonium nitrate		100% salt	
ammonium sulfate	AMS	spray grade fertilizer	
copper sulfate		100% salt	
Freeway		organosilicone surfactant	Loveland
Herbimax	COC	80% paraffin base petroleum oil 20% surfactant	Loveland
LI6193-11	COC		Loveland
MSO		Methylated Seed Oil	Loveland
28% Nitrogen	UAN	28% urea ammonia nitrate solution	
Silwet L-77		organosilicone surfactant	Loveland
Sylgard 309		organosilicone surfactant	DowCorning

ABBREVIATIONS USED IN THE REPORT

A =	Acre
ai =	Active Ingredient
Amt =	Amount
ACS =	Aqueous Capsule Suspension
AS =	Aqueous Solution
ASPA =	Asparagus
CEC =	Caption Exchange Capacity
CHES =	Clarksville Horticulture Experiment Station
CS =	Capsule Suspension
CV =	Coefficient of Variability
DF =	Dry Flowable
DS =	Designator
EC =	Emulsifiable Concentrate
F =	Flowable
FORM =	Formulation
FM =	Formulation
FT =	Distance in FT
g / gr =	Gram
GAL =	Gallon
GPA =	Gallon per acre
GROW STG =	Growth Stage at time of Application
HTRC =	Horticulture Teaching and Research Station
IN =	Inch
KG =	Kilogram
L =	Liquid
LPRE =	Late PRE
LO =	Low Odor
LSD =	Least Significant Difference
LB =	Pounds
ME =	Microencapsulated
MKTBL =	Marketable
MPH =	Mile(s) per hour
MSU =	Michigan State University
N =	No
N/A =	Not Applicable/ Not Available
No. =	Number
OM =	Organic Matter
oz =	Ounce
P =	Probability
POH =	Post Harvest
PO1 =	Postemergence 1
PO2 =	Postemergence 2
POT =	Post Transplant
PPI =	Preplant Incorporated
PRE =	Preemergence
PREC. =	Precipitation (inches)
PRT =	Pretransplant
PSI =	Pounds per square inch
PT PR =	Pint Product
QT =	Quart
QT PR =	Quart Product
RCBD =	Randomized Complete Block Design
RH =	Relative Humidity
REPS =	Replication
SNBE =	Snapbean
SP =	Soluble Powder
STBE =	Strawberry
SURF =	Surface
T =	Temperature
TRNC =	Trevor Nichols Research Complex
TRT =	Treatment
UNMKTBL =	Unmarketable
VOAS =	Volunteer Asparagus
WDG =	Water Dispersible Granule
WG =	Water Soluble Granule
WP =	Wettable Powder
WT =	Weight
" =	Inches
Y =	Yes

TEMPERATURE AND PRECIPITATION DATA

MSU Horticulture Teaching and Research Center

Recorded at
MSU Horticulture Teaching and Research Center (HTRC)
East Lansing, Michigan
2009

	APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	53.7	36.4	0.01	**1**	60.7	42.8	0.02	1	77.4	46.6	0.04
2	64.5	39.6		**2**	62.1	41.7		2	63.0	49.6	
3	51.4	36.9	1.12	**3**	68.4	38.0		3	67.3	47.4	
4	51.9	32.1		**4**	67.2	38.9		4	70.3	43.4	
5	45.7	31.0	0.13	**5**	69.8	43.6		5	74.4	41.5	0.01
6	41.5	29.4	0.42	**6**	68.0	48.8		6	71.0	52.8	
7	37.5	27.6		**7**	73.3	52.6	0.10	7	75.5	54.8	
8	51.5	30.5		**8**	74.1	48.1		8	76.7	53.5	1.39
9	57.2	27.8		**9**	61.3	48.5	0.97	9	67.9	55.1	
10	52.0	32.3		**10**	58.9	44.9		10	76.0	52.4	
11	51.5	28.2		**11**	61.4	37.4		11	67.2	56.8	
12	52.3	24.9		**12**	66.7	34.6		12	75.2	49.5	
13	46.1	31.2		**13**	64.2	49.6	0.06	13	68.1	53.2	0.07
14	43.4	35.7	0.97	**14**	68.0	47.6	0.39	14	78.9	49.6	
15	60.0	36.8	0.07	**15**	66.8	41.7		15	80.6	50.5	
16	63.4	30.0		**16**	61.5	45.3	0.39	16	76.0	53.4	
17	71.4	32.5		**17**	59.6	35.0		17	69.9	58.6	1.36
18	74.0	38.2		**18**	66.0	32.2	0.10	18	77.7	58.7	0.01
19	56.7	42.4	0.28	**19**	75.6	47.6	0.04	19	79.4	62.6	1.82
20	46.5	40.0	0.56	**20**	83.4	51.4		20	82.4	66.3	0.04
21	45.9	37.2	0.04	**21**	83.9	53.5		21	81.1	63.7	
22	54.8	35.8	0.01	**22**	68.0	54.2		22	84.4	62.9	
23	62.0	30.6		**23**	79.4	47.8		23	89.8	62.1	
24	84.5	51.8		**24**	73.6	57.2		24	94.0	68.0	
25	77.5	60.9	1.58	**25**	71.8	49.5		25	91.0	68.7	0.02
26	71.6	47.2	0.04	**26**	72.6	52.1	0.19	26	84.0	64.1	
27	79.3	62.0	0.17	**27**	77.8	59.4	2.01	27	83.6	57.2	
28	62.6	44.6	0.40	**28**	61.2	52.9	0.01	28	78.7	62.1	
29	61.8	42.9		**29**	73.8	48.2	0.01	29	73.2	60.7	
30	66.4	50.6	0.70	**30**	72.1	42.9		30	64.8	57.9	0.21
				31	66.3	40.0					

TEMPERATURE AND PRECIPITATION DATA

MSU Horticulture Teaching and Research Center

Recorded at
MSU Horticulture Teaching and Research Center (HTRC)
East Lansing, Michigan
2009

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	67.2	55.9	0.30	**1**	77.8	56.7	0.12	**1**	73.6	41.0	
2	65.6	54.4	0.02	**2**	75.0	55.1		**2**	74.7	44.9	
3	73.6	57.4		**3**	81.3	54.9		**3**	78.1	47.2	
4	73.0	51.9		**4**	83.1	67.3		**4**	78.2	49.7	
5	80.6	53.4		**5**	77.0	51.0		**5**	78.7	49.8	
6	79.3	53.9		**6**	78.5	50.1		**6**	78.0	50.1	
7	72.9	50.4		**7**	77.3	52.0		**7**	73.8	59.3	
8	74.8	48.7	0.07	**8**	79.1	61.2	1.52	**8**	73.7	61.5	0.01
9	80.0	52.9		**9**	91.4	71.0	0.24	**9**	79.4	58.4	
10	81.6	58.4		**10**	83.8	68.3	0.37	**10**	79.4	55.5	
11	81.9	59.1	0.17	**11**	81.6	64.7		**11**	78.0	53.6	
12	77.3	52.3		**12**	80.7	62.0		**12**	75.1	50.8	
13	76.2	46.6	0.03	**13**	83.6	56.7		**13**	80.6	46.7	
14	77.6	47.2		**14**	84.4	59.4		**14**	82.8	55.4	
15	82.2	60.2	0.03	**15**	85.5	61.1		**15**	80.6	59.3	
16	77.5	60.7	0.01	**16**	89.6	65.6		**16**	66.8	50.7	
17	69.6	58.0	0.01	**17**	79.8	70.1	0.32	**17**	73.4	41.3	
18	69.2	50.4	0.02	**18**	81.9	67.6		**18**	75.8	43.0	
19	72.7	49.0		**19**	81.8	58.6	0.03	**19**	71.7	41.1	
20	78.7	53.6	0.07	**20**	79.8	67.3	0.07	**20**	76.7	40.4	
21	79.5	54.3		**21**	75.9	61.6		**21**	78.3	62.3	0.46
22	76.5	63.0	0.17	**22**	66.7	56.1	0.01	**22**	81.9	60.1	
23	77.0	63.0	1.26	**23**	69.1	58.4		**23**	75.4	66.2	
24	80.0	58.2		**24**	78.0	50.6		**24**	70.9	53.4	
25	79.0	64.6	0.03	**25**	82.1	53.5		**25**	72.6	52.9	0.07
26	74.5	62.0		**26**	73.9	58.9	0.90	**26**	64.2	54.3	0.04
27	83.0	57.3		**27**	68.7	55.5		**27**	72.1	53.8	
28	83.9	67.8	0.20	**28**	65.1	57.4	0.50	**28**	65.0	50.3	0.35
29	78.4	61.1		**29**	66.8	57.4	0.03	**29**	60.9	47.3	0.02
30	77.8	52.9		**30**	67.8	49.3	0.01	**30**	57.4	38.2	
31	78.9	58.5		**31**	69.1	43.3					

TEMPERATURE AND PRECIPITATION DATA

MSU Muck Soils Research Station

Recorded at
MSU Muck Soils Research Station (Muck Farm)
Laingsburg, Michigan
2009

APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	52.4	35.0		**1**				**1**	76.7	41.5	0.05
2	64.0	33.5		**2**	61.0	36.1		**2**	62.8	47.6	
3	51.2	35.4	1.01	**3**	67.5	33.9		**3**	68.5	42.2	
4	51.0	31.4		**4**	67.2	34.3		**4**	71.1	36.7	
5	44.4	28.0	0.11	**5**	68.8	40.8		**5**	75.8	35.9	
6	40.0	28.8	0.38	**6**	68.0	47.9		**6**	72.4	48.6	
7	36.0	27.0		**7**	72.0	49.7	0.11	**7**	75.1	49.9	0.02
8	50.7	29.3		**8**	74.0	45.2		**8**	73	51.3	1.76
9	56.3	25.3		**9**	60.5	47.2	0.34	**9**	67.6	53.5	
10	50.4	30.5		**10**	58.6	39.7		**10**	75.3	58.2	
11	51.8	27.6		**11**	60.9	30.6		**11**	66.7	54.5	0.01
12	50.6	23.4		**12**	66.7	30.2		**12**	75.3	43.8	
13	46.0	28.5		**13**	64.4	50.1	0.13	**13**	68.6	50.4	0.06
14	41.5	34.5	0.78	**14**	67.2	44.6	0.59	**14**	78.9	44.4	
15	58.9	35.6	0.09	**15**	66.4	36.7	0.02	**15**	80.8	45.0	
16	62.7	27.1		**16**	60.8	43.2	0.35	**16**	78.2	46.5	
17				**17**	59.4	30.1		**17**	70.8	57.9	1.42
18				**18**	66.3	28.9		**18**	76.9	57.9	0.01
19				**19**	76.9	45		**19**	80.1	62.1	2.33
20				**20**	84.2	47.5		**20**	82.7	65.1	0.08
21				**21**	83.9	54.5		**21**	81.6	62.3	
22				**22**	67.6	47.4		**22**	84.3	61.0	
23				**23**	81.0	45.8		**23**	89.9	60.5	
24	82.7	69.3		**24**	75.1	53.5	0.02	**24**	95.8	66.3	
25	77.8	55.7	0.92	**25**	72.3	42.1		**25**	90.3	67.4	
26	67.9	44.4	0.02	**26**	72.4	49.6	0.21	**26**	83.2	59.9	
27	78.2	52.6	0.57	**27**	78.8	57.0	1.21	**27**	82.7	53.4	
28	61.4	43.4	0.64	**28**	61.2	51.6		**28**	77.2	57.6	
29	62.8	40.8		**29**	73.4	43.9		**29**	71.8	56.0	0.02
30	65.8	51.5	0.45	**30**	72.0	37.7		**30**	63.8	57.6	
				31	66.0	35.4					

TEMPERATURE AND PRECIPITATION DATA

MSU Muck Soils Research Station

Recorded at
MSU Muck Soils Research Station (Muck Farm)
Laingsburg, Michigan
2009

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. In.	Date	High Temp F	Low Temp F	Total Prec. in.
1	66.5	53.4	0.17	**1**	78.3	52.8	0.10	**1**	74.1	36.1	
2	65.0	54.4	0.04	**2**	74.6	52.5		**2**	76.3	40.1	
3	73.1	52.9		**3**	81.8	50.9		**3**	78.3	42.2	
4	74.1	47.2		**4**	84.7	62.9		**4**	78.8	43.4	
5	81.1	48.8	0.09	**5**	77.6	46.5		**5**	81.0	43.9	
6	78.8	48.4		**6**	80.1	45.0		**6**	78.3	44.9	
7	73.3	43.9		**7**	78.4	45.8		**7**	75.6	55.6	
8	76.0	42.1		**8**	79.4	60.2	2.26	**8**	75.6	56.8	0.01
9	81.3	45.8		**9**	91.5	70.7	0.41	**9**	78.0	52.1	
10	82.2	53.7		**10**	82.9	67.5	0.74	**10**	81.6	48.7	
11	81.2	54.6	0.33	**11**	80.8	62.1		**11**	79.3	48.8	0.01
12	77.3	45.2		**12**	80.9	58.6		**12**	76.3	45.1	
13	77.2	40.1		**13**	83.9	52.8		**13**	81.8	42.1	
14	80.0	40.8		**14**	85.5	55.8		**14**	83.1	50.9	
15	81.9	58.4	0.01	**15**	86.6	58.6		**15**	81.4	53.1	
16	77.2	53.5	0.01	**16**	90.3	63.5	0.01	**16**	67.0	42.5	
17	69.5	53.2	0.04	**17**	80.7	69.2	0.13	**17**	73.7	34.8	
18	67.6	44.8	0.01	**18**	82.2	62.9	0.01	**18**	76.9	38.0	
19	74.6	45.2	0.47	**19**	82.4	52.5	0.04	**19**	71.2	33.8	
20	79.4	50.3		**20**	80.2	67.7	0.06	**20**	77.0	33.2	
21	79.4	50.4	0.01	**21**	75.3	60.9		**21**	78.4	59.0	0.30
22	78.0	59.6	0.03	**22**	65.8	54.6		**22**	82.3	55.0	0.01
23	77.5	59.7	4.19	**23**	69.8	58.5	0.01	**23**	74.2	62.2	
24	80.5	56		**24**	78.5	47.0		**24**	71.3	48.4	
25	77.0	62.4	0.03	**25**	82.3	48.6	0.01	**25**	73.9	43.9	
26	74.1	58.5	0.10	**26**	73.5	56.1	0.83	**26**	62.3	52.2	0.11
27	82.7	53.8		**27**	67.3	51.9	0.02	**27**	71.7	52.6	0.01
28	82.9	64.1	0.06	**28**	62.0	56.7	0.56	**28**	63.6	49.1	0.62
29	77.1	55.1	0.03	**29**	66.1	56.3	0.03	**29**	59.9	46.8	0.02
30	77.5	49		**30**	67.6	44.8	0.03	**30**	56.4	31.8	
31	78.0	52.9		**31**	69.3	37.4					

TEMPERATURE AND PRECIPITATION DATA

MSU Clarksville Horticulture Research Station

Recorded at
MSU Clarksville Horticulture Research Station (Clarksville)
Clarksville, Michigan
2009

APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	48.7	34.3	0.05	**1**	56.2	41.9		**1**	74.1	47.9	0.04
2	60.7	34.8		**2**	59.6	39.7		**2**	61.4	48.5	
3	49.1	34.3	0.64	**3**	65.6	41.3		**3**	67.5	46.4	
4	50.0	29.7		**4**	66.7	38.8		**4**	71.4	41.1	
5	41.6	30.6	0.01	**5**	68.4	43.3		**5**	74.1	41.1	
6	43.7	27.3		**6**	69.5	46.4		**6**	70.2	50.8	
7	37.7	25.0		**7**	71.8	51.5		**7**	72.4	51.2	
8	50.5	26.3		**8**	72.9	49.7		**8**	76.3	49.9	0.79
9	55.9	28.0		**9**	60.4	44.9	0.52	**9**	64.1	50.8	
10	50.7	29.5		**10**	57.4	40.6		**10**	75.4	49.2	
11	52.8	24.8		**11**	59.1	33.4		**11**	64.0	53.4	0.07
12	52.1	25.5		**12**	66.3	34.6		**12**	74.1	47.6	
13	45.8	28.3		**13**	64.2	48.7	0.01	**13**	71.7	54.8	0.08
14	41.6	32.6	0.43	**14**	66.4	46.8	0.53	**14**	78.1	51.0	
15	60.2	38.4		**15**	64.0	44.5	0.01	**15**	80.6	51.4	
16	64.1	30.0		**16**	58.6	40.9	0.05	**16**	78.9	51.6	
17	69.1	33.3		**17**	58.5	32.8		**17**	66.6	56.3	0.58
18	71.8	41.7		**18**	64.9	33.6		**18**	76.8	58.3	0.02
19	57.7	40.3	0.30	**19**	76.2	48.0		**19**	77.1	62.4	2.71
20	41.8	36.7	0.31	**20**	82.6	54.9		**20**	80.5	64.1	0.03
21	41.8	34.3	0.07	**21**	80.9	57.2		**21**	82.2	62.6	
22	53.4	32.8	0.03	**22**	68.0	52.6		**22**	85.2	62.4	
23	59.5	27.4		**23**	75.3	48.8		**23**	88.2	64.7	
24	82.9	46.5	0.01	**24**	75.1	55.4	0.01	**24**	92.9	67.1	
25	73.8	48.4	1.03	**25**	69.9	47.0		**25**	89.4	69.4	
26	65.5	43.4	0.64	**26**	76.2	49.1	0.19	**26**	84.1	64.3	
27	75.8	50.0	0.63	**27**	76.3	54.6	0.89	**27**	82.7	56.9	
28	59.2	40.7	0.64	**28**	55.6	50.4	0.01	**28**	74.6	61.3	0.40
29	62.0	39.0		**29**	69.6	47.2		**29**	71.3	58.0	0.06
30	64.2	49.3	0.66	**30**	71.7	44.7		**30**	63.1	55.6	0.01
				31	65.3	38.6					

TEMPERATURE AND PRECIPITATION DATA

MSU Clarksville Horticulture Research Station

Recorded at
MSU Clarksville Horticulture Research Station (Clarksville)
Clarksville, Michigan
2009

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	63.5	53.2	0.06	**1**	76.6	55.4	0.01	**1**	72.6	39.6	
2	63.7	51.4		**2**	72.6	55.4	0.04	**2**	74.6	43.6	
3	72.2	56.2		**3**	81.7	57.3		**3**	76.5	45.8	
4	74.1	53.2		**4**	83.2	58.1		**4**	77.9	47.9	
5	78.7	51.0		**5**	76.6	46.8		**5**	79.0	50.0	
6	77.1	54.9		**6**	77.7	49.5		**6**	76.5	52.6	
7	72.0	47.9		**7**	77.3	49.8		**7**	78.2	53.2	
8	75.7	47.1		**8**	78.0	59.1	1.37	**8**	74.1	58.7	
9	80.4	50.9		**9**	88.8	67.0	0.24	**9**	80.0	56.8	
10	79.3	57.8		**10**	81.9	65.5	1.18	**10**	80.5	54.3	
11	77.7	58.3	0.85	**11**	79.9	62.4		**11**	78.9	53.1	
12	74.8	52.5		**12**	80.1	57.3		**12**	73.8	50.0	
13	74.7	47.1		**13**	83.6	55.2		**13**	79.9	47.4	
14	77.1	46.4		**14**	84.1	57.8		**14**	82.2	54.9	
15	79.9	57.3	0.24	**15**	84.5	62.7		**15**	80.0	59.2	
16	73.3	58.6		**16**	87.6	64.1	0.34	**16**	66.7	48.5	
17	65.8	52.6		**17**	79.9	68.3	0.07	**17**	71.7	41.7	
18	66.1	48.3		**18**	79.3	60.3	0.02	**18**	76.7	44.8	
19	68.9	46.5	0.38	**19**	80.0	54.7	0.13	**19**	72.2	43.5	
20	77.4	49.2	0.01	**20**	75.2	64.2	0.06	**20**	76.0	38.3	
21	81.5	53.7		**21**	71.3	58.3		**21**	71.9	56.3	0.28
22	79.8	60.6	0.34	**22**	66.8	52.4	0.05	**22**	79.3	53.8	
23	75.3	58.6	0.33	**23**	68.5	56.3		**23**	72.8	61.1	0.01
24	78.8	55.9		**24**	76.6	49.8		**24**	69.1	53.9	
25	76.4	60.2	0.06	**25**	78.8	54.4	0.20	**25**	72.9	51.1	0.05
26	71.4	58.6	0.01	**26**	75.1	58	0.91	**26**	62.4	54.0	0.01
27	80.7	56.3		**27**	64.7	53.7	0.05	**27**	70.2	53.3	0.01
28	81.1	63.6		**28**	61.8	54.6	0.11	**28**	63.6	46.1	0.51
29	75.4	56.8		**29**	60.7	53.5	0.11	**29**	57.1	45.2	0.16
30	76.0	51.6		**30**	67.3	47.2	0.01	**30**	55.8	36.0	0.01
31	76.6	55.1		**31**	68.5	40.5	0.01				

TEMPERATURE AND PRECIPITATION DATA

MSU Trevor Nichols Research Complex

Recorded at
MSU Trevor Nichols Research Complex (Fennville)
Fennville, Michigan
2009

APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	48.2	35.8		**1**	58.1	40.1	0.01	**1**	73.5	50.4	0.19
2	63.1	36		**2**	61.7	38.3		**2**	67.7	49.1	0.01
3	51.0	34.9	0.62	**3**	65.5	35.8		**3**	65.2	46.9	
4	44.1	32.1		**4**	69.7	41.8		**4**	71.2	44.0	
5	43.5	32.8	0.12	**5**	71.1	47.9		**5**	72.9	40.1	
6	41.6	29.5		**6**	73.7	50.3		**6**	73.0	50.8	0.01
7	38.9	29.9		**7**	72.0	52.4	0.02	**7**	74.3	59.0	
8	48.9	25.0		**8**	70.4	48.6		**8**	80.9	54.3	0.37
9	53.7	27.9		**9**	59.5	43.6	0.29	**9**	60.9	48.0	
10	55.1	33.8		**10**	60.0	37.9		**10**	74.0	47.6	
11	48.1	28.4		**11**	54.9	32.2		**11**	64.8	55.5	0.05
12	56.6	27.5		**12**	68.7	33.4		**12**	75.0	49.8	
13	49.1	35.0		**13**	69.4	54.0		**13**	73.1	51.5	0.09
14	44.5	35.0	0.44	**14**	69.9	46.3	0.52	**14**	77.4	49.8	
15	63.8	39.3		**15**	65.3	44.5	0.15	**15**	82.3	50.2	
16	67.0	32.7		**16**	59.4	39.6	0.01	**16**	78.0	51.5	
17	65.0	32.2		**17**	55.5	33.0		**17**	69.3	55.7	1.03
18	69.7	34.4		**18**	63.4	32.1		**18**	79.0	54.8	
19	58.0	44.7	0.31	**19**	74.8	47.7		**19**	81.1	63.4	2.38
20	45.0	36.4	0.5	**20**	79.7	54.3		**20**	79.7	61.1	0.02
21	38.3	34.9	0.22	**21**	79.8	57.3		**21**	87.3	61.2	
22	52.4	36.1		**22**	72.0	55.0		**22**	88.7	66.9	
23	63.4	26.7		**23**	78.9	48.3		**23**	88.4	67.6	
24	82.6	53.3		**24**	78.0	56.9	0.02	**24**	88.8	67.6	
25	74.9	44.2	1.08	**25**	73.4	53.6		**25**	88.2	67.6	
26	76.2	46.1	0.42	**26**	80.8	50.5	0.78	**26**	85.9	60.1	
27	73.8	56.4	0.77	**27**	77.6	54.0	0.88	**27**	81.8	59.0	
28	60.8	43.4	0.15	**28**	54.3	46.8		**28**	77.2	59.9	0.35
29	62.3	44.6		**29**	65.9	46.4		**29**	70.8	58.6	0.02
30	66.9	44.3	0.50	**30**	69.8	42.9		**30**	66.3	57.5	
				31	66.5	41.4					

TEMPERATURE AND PRECIPITATION DATA

MSU Trevor Nichols Research Complex

Recorded at
MSU Trevor Nichols Research Complex(Fennville)
Fennville, Michigan
2009

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	62.3	54.5	0.06	**1**	75.5	57.0	0.03	**1**	71.1	40.9	
2	64.1	51.2		**2**	72.8	56.6		**2**	77.2	43.7	
3	73.6	56.3		**3**	82.7	57	0.02	**3**	79.0	46.0	
4	77.3	54.5		**4**	79.8	63.0		**4**	77.0	48.3	
5	76.2	51.9		**5**	75.9	50.2		**5**	80.4	50.4	
6	77.5	55.6		**6**	77.9	50.6		**6**	78.7	51.4	
7	72.2	51.4		**7**	78.4	53.3	0.05	**7**	80.2	52.7	
8	77.5	48.5		**8**	83.0	61.4	1.60	**8**	74.2	60.5	
9	82.2	53.1		**9**	87.8	68.3	0.23	**9**	79.6	57.7	
10	80.0	58.2		**10**	79.6	66.5	0.22	**10**	81.4	57.2	
11	76.4	58.0	0.54	**11**	79.2	63.1		**11**	82.0	55.9	
12	75.7	52.7		**12**	77.9	57.0		**12**	78.7	49.9	
13	77.2	50.4		**13**	82.6	54.5		**13**	75.1	45.7	
14	79.6	48.5		**14**	82.5	58.9		**14**	76.5	53.1	
15	80.6	60.0	0.37	**15**	86.3	62.8		**15**	82.5	57.6	
16	73.4	63.4	0.13	**16**	89.7	65.8	0.11	**16**	68.2	49.0	
17	69.2	52.1	0.01	**17**	81.3	68.6	0.22	**17**	72.4	42.6	
18	66.2	51.4		**18**	77.5	60.0	0.07	**18**	76.2	43.2	
19	71.1	52.0	0.12	**19**	82.7	55.3	0.13	**19**	74.3	46.3	
20	77.8	49.4		**20**	75.8	66.3	0.24	**20**	76.8	43.7	0.01
21	80.5	53.8		**21**	71.6	59.8	0.04	**21**	68.6	54.9	0.04
22	78.3	61.4		**22**	66.3	55.1	0.27	**22**	79.8	53.3	0.26
23	72.3	59.7		**23**	69.8	52.3		**23**	71.4	51.4	0.01
24	76.8	55.0		**24**	73.8	49.9		**24**	72.1	57.6	
25	75.5	64.7		**25**	78.4	54.8	0.15	**25**	73.1	56.4	
26	72.8	61.8		**26**	76.7	61.1	1.49	**26**	67.9	52.7	
27	81.3	57.1		**27**	64.2	57.7	0.02	**27**	70.3	49.4	0.12
28	77.2	68.7		**28**	69.8	57.4	0.05	**28**	62.4	50.4	0.47
29	75.3	56.5		**29**	61.4	56.1	0.25	**29**	53.6	47.9	0.01
30	77.1	53.6		**30**	66.6	48.5		**30**	55.6	36.1	
31	76.5	55.1		**31**	69.0	42.9					

TEMPERATURE AND PRECIPITATION DATA

Fremont and Grant

Recorded at
City of Fremont
Fremont, Michigan
2009

APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	45.0	36.0		**1**	55.7	42		**1**	69.7	62.5	0.01
2	60.2	30.2		**2**	60.2	38.6		**2**	66.7	60.5	
3	47.5	35.1	0.43	**3**	66.6	35.8		**3**	69.3	61.4	
4	48.7	30.6		**4**	70.0	39.6		**4**	72.7	49.8	
5	43.9	31.2		**5**	69.8	46.3		**5**	72.3	42.1	
6	42.6	28.5		**6**	71.1	46.9		**6**	66.3	36.2	0.01
7	40.7	27.9		**7**	70.8	53.1	0.05	**7**	65.4	58.1	0.04
8	50.9	26.9		**8**	72.2	45.3		**8**	72.6	50.7	1.04
9	54.4	23.4		**9**	56.2	43.5	0.41	**9**	64.2	43.2	
10	56.9	28.3		**10**	56.8	37.4		**10**	76.3	46.2	0.01
11	54.1	26.9		**11**	61.4	29.5		**11**	64.1	51.6	0.01
12	54.3	23.2		**12**	66.5	33.3		**12**	75.2	52.4	
13	46.3	30.7		**13**	62.4	52.5	0.48	**13**	75.4	55.9	
14	51.9	39.9		**14**	64.3	47.4	0.52	**14**	78.5	57.8	
15	66.1	43.2		**15**	63.2	42.7		**15**	82.7	62.4	
16	69.7	30.0		**16**	57.0	37.5		**16**	77.5	58.8	
17	67.9	31.4		**17**	59.6	30.3		**17**	69.2	61.7	0.42
18	71.1	32.9		**18**	62.0	30.3		**18**	77.3	66.0	
19	56.4	39.8	0.28	**19**	73.2	46.5		**19**	78.4	58.8	0.33
20	40.8	36.3	0.59	**20**	78.4	57.8		**20**	82.5	48.7	0.09
21	39.1	33.8	0.16	**21**	78.3	58.4		**21**	85.4	56.5	
22	55.1	31.6		**22**	66.9	52.2		**22**	86.8	48.0	
23	58.3	25.3		**23**	75.7	51.9		**23**	87.2	51.7	
24	79.4	49.0		**24**	79.5	57.1		**24**	95.2	52.4	
25	72.8	45.3	0.62	**25**	67.4	48.1		**25**	87.8	58.4	
26	63.0	44.3	1.01	**26**	71.8	49.1	0.07	**26**	85.5	63.7	
27	71.3	50.7		**27**	73.3	56.9	0.53	**27**	83.6	63.7	0.05
28	63.1	41.8	0.13	**28**	56.9	47.5	0.05	**28**	76.4	57.7	0.02
29	59.5	41.5		**29**	69.2	46.2		**29**	70.8	49.8	0.11
30	58.2	51.7	1.26	**30**	68.9	44.7	0.08	**30**	64.4	46.0	
				31	64.5	35.8					

TEMPERATURE AND PRECIPITATION DATA

Fremont and Grant

Recorded at
City of Fremont
Fremont, Michigan
2009

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	59.5	53.3	0.04	**1**	73.0	55.2	0.19	**1**	73.5	39.1	
2	64.7	51.7	0.01	**2**	74.2	54.2		**2**	79.4	42.8	
3	72.3	55.2		**3**	78.8	59.5	0.25	**3**	79.1	45.7	
4	74.1	54.5		**4**	82.5	56.4		**4**	78.2	47.3	
5	81.0	49.7		**5**	75.7	47.6		**5**	81.3	50.3	
6	78.9	49.9		**6**	78.4	49.2		**6**	81.3	53.4	
7	71.6	46.5		**7**	76.2	52.1	0.01	**7**	82.9	54.2	
8	80.3	46.0		**8**	80.0	59.9	1.85	**8**	78.9	55.1	
9	82.4	54.6		**9**	85.4	67.9	0.81	**9**	81.8	56.4	
10	79.6	57.5		**10**	82.5	65.9	0.05	**10**	81.2	57.1	
11	78.8	56.4	0.46	**11**	81.1	61.1	0.06	**11**	81.2	55.7	
12	75.7	48.6		**12**	82.7	54.8		**12**	80.5	50.1	
13	77.0	46.1		**13**	81.1	54.6		**13**	81.2	47.4	
14	78.9	45.8		**14**	82.4	57.6		**14**	84.6	53.4	
15	79.0	59.4	0.36	**15**	83.5	62.3		**15**	82.9	60.0	
16	72.6	57.5		**16**	86.0	68.3	0.24	**16**	69.2	50.0	
17	64.5	50.5		**17**	75.8	66.9		**17**	74.7	40.4	
18	66.7	51.7		**18**	77.1	56.9		**18**	79.8	44.5	
19	75.5	51.2		**19**	78.8	51.9	0.25	**19**	75.7	45.8	
20	77.1	45.7		**20**	73.6	65.9	0.67	**20**	74.9	41.5	
21	82.4	51.8	0.03	**21**	68.4	57.2	0.11	**21**	68.7	58.1	0.47
22	77.7	59	0.24	**22**	67.7	54.4	0.03	**22**	75.2	54.4	0.73
23	78.4	58.8		**23**	72.1	54.0		**23**	77.2	59.4	0.46
24	78.3	54.8		**24**	75.7	48.0		**24**	71.5	55.1	
25	77.2	62.7	0.05	**25**	75.6	55.8	0.22	**25**	71.6	53.1	
26	73.3	60.1	0.01	**26**	80.2	60.9	0.09	**26**	66.1	53.9	
27	80.5	55.7	0.01	**27**	67.9	55.7		**27**	68.5	46.9	0.81
28	79.5	62.9		**28**	59.6	55.2		**28**	55.4	47.0	0.51
29	76.2	56.6		**29**	60.5	53.4	0.09	**29**	53.1	46.0	0.01
30	74.8	52.6		**30**	67.3	46.9		**30**	59.6	38.3	
31	77.7	51.7		**31**	71.5	38.2					

TEMPERATURE AND PRECIPITATION DATA

Hart

Recorded at
Asparagus Research Farm
Hart, Michigan
2009

	APRIL				MAY				JUNE		
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	43.4	34.6		**1**	55.1	40.4		**1**	65.1	45	0.15
2	53.9	28.2		**2**	59.7	39.1		**2**	60.0	39.3	
3	43.4	32.9	0.16	**3**	64.4	38.4		**3**	64.0	43.1	
4	47.9	32.3		**4**	69.9	40.9		**4**	66.7	34.4	
5	44.7	29.2		**5**	71.3	45.8		**5**	72.5	38.3	
6	37.8	28.9		**6**	71.2	47.5		**6**	59.3	47.1	0.03
7	41.5	25.1		**7**	70.8	53.0	0.01	**7**	64.1	51.1	0.40
8	49.9	24.6		**8**	72.2	46.7		**8**	69.0	48.9	1.53
9	51.7	23.1		**9**	55.9	41.6	0.73	**9**	60.3	47.1	
10	54.9	25.6		**10**	52.1	35.5	0.01	**10**	69.7	49.8	
11	48.8	24.0		**11**	56.7	29.2		**11**	69.5	54.6	
12	54.9	19.3		**12**	65.9	33.7		**12**	70.0	47.6	
13	47.1	30.3		**13**	63.4	53.0	1.72	**13**	73.6	50.3	
14	55.8	41.3		**14**	62.7	48.2	0.52	**14**	76.5	47.7	
15	66.0	38.7		**15**	65.7	44.9		**15**	77.9	50.1	
16	62.7	33.8		**16**	58.4	34.1		**16**	79.2	55.3	
17	65.9	31.3		**17**	59.7	33.1		**17**	75.1	59.1	0.05
18	72.2	42.5		**18**	63.3	35.4		**18**	78.2	55.6	
19	53.4	41.1	0.13	**19**	73.2	53.1		**19**	74.4	64.3	0.54
20	41.3	33.8	0.67	**20**	78.5	59.6		**20**	82.5	63.4	0.52
21	36.8	33.0	0.27	**21**	77.9	55.5		**21**	82.3	61.4	
22	51.5	33.5		**22**	72.4	52.5		**22**	86.5	60.6	
23	59.0	24.5		**23**	74.7	53.0		**23**	87.3	68.5	
24	78.8	50.4		**24**	73.4	54.2		**24**	93.0	67.7	
25	69.1	41.1	0.78	**25**	69.4	44.6		**25**	83.4	66.1	
26	58.5	40.9	0.80	**26**	65.6	47.1	0.56	**26**	81.7	58.3	
27	69.1	47.7	0.07	**27**	65.4	57.1	1.13	**27**	83.5	57.2	0.01
28	63.5	40.9	0.12	**28**	57.3	43.3	0.04	**28**	76.8	65.1	0.01
29	61.2	41.6		**29**	68.6	43.9		**29**	69.9	57.9	0.19
30	58.7	47.8	0.68	**30**	67.8	43.3		**30**	64.8	54.6	0.19
				31	62.0	33.6					

TEMPERATURE AND PRECIPITATION DATA

Hart

Recorded at
Asparagus Research Farm
Hart, Michigan
2009

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	58.7	52.8	0.13	**1**	73.3	57.7		**1**	69.6	39.6	
2	63.4	53.7		**2**	74.4	57.9		**2**	73.9	43.9	
3	72.6	55.0		**3**	78.2	64.5	0.27	**3**	73.8	45.2	
4	75.0	54.4		**4**	77.4	52.5		**4**	74.6	43.9	
5	78.7	50.9		**5**	75.6	45.8		**5**	78.0	47.1	
6	75.9	50.5		**6**	76.1	51.3		**6**	78.7	53.6	
7	70.8	44.9		**7**	75.3	53.9	0.03	**7**	80.6	52.9	
8	72.9	44.2		**8**	80.6	60.8	1.41	**8**	81.8	52.8	
9	81.1	52.5		**9**	85.9	69.9	0.03	**9**	80.7	55.6	
10	80.6	61.7		**10**	81.2	66.3	0.02	**10**	82.4	58.6	
11	77.3	55.0	0.13	**11**	75.7	57.8	0.03	**11**	81.8	57.6	
12	74.3	48.7		**12**	79.1	52.9	0.01	**12**	78.0	48.9	
13	75.8	44.2		**13**	82.3	52.8		**13**	77.0	47.1	
14	79.8	46.9		**14**	82.3	60.1		**14**	80.6	54.8	
15	80.6	60.6	0.10	**15**	84.2	62.2		**15**	77.7	59.0	0.05
16	73.8	57.8		**16**	86.8	64.8	0.04	**16**	69.5	49.0	
17	64.2	48.0		**17**	75.0	68.1		**17**	72.0	40.8	
18	68.9	49.7		**18**	74.6	62.7	0.01	**18**	78.5	44.3	
19	71.2	48.6		**19**	79.4	50.4	0.16	**19**	73.1	46.7	
20	75.6	43.2		**20**	73.9	63.4	0.50	**20**	74.1	43.0	
21	81.6	52.2		**21**	68.2	56.6	0.09	**21**	66.3	53.9	0.06
22	74.8	60.3	0.33	**22**	63.4	53.5	0.09	**22**	75.5	50.7	0.06
23	73.2	57.1		**23**	68.8	49.3		**23**	73.1	53.9	0.01
24	79.7	54.4		**24**	76.2	48.2		**24**	71.2	52.0	
25	76.7	62.3	0.27	**25**	75.0	55.8	0.54	**25**	73.7	51.8	0.01
26	70.4	58.8	0.01	**26**	76.9	60.2	0.17	**26**	65.8	50.8	
27	80.6	57.2		**27**	67.3	55.3		**27**	70.3	50.9	0.78
28	78.6	64.3		**28**	60.1	52.3	0.06	**28**	57.8	47.6	0.87
29	74.1	52.3		**29**	60.3	53.0	0.37	**29**	51.6	44.6	0.14
30	73.6	56.8		**30**	64.9	44.7		**30**	54.8	31.0	
31	75.6	53.5		**31**	65.9	37.7					

TEMPERATURE AND PRECIPITATION DATA

Hudsonville

Recorded at
Michigan Celery Cooperative
Hudsonville, Michigan
2009

APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	48.0	36.5		**1**	57.6	43.4		**1**	72.5	53.9	0.05
2	61.6	33.6		**2**	60.8	40.9		**2**	64.9	50.1	
3	51.5	34.9	0.86	**3**	65.5	40.9		**3**	70.2	45.8	0.14
4	49.0	31.1		**4**	69.1	42.7		**4**	72.1	40.4	
5	42.1	34.4		**5**	72.8	45.9		**5**	73.8	40.2	
6	43.7	30.0		**6**	72.8	52.4	0.03	**6**	71.5	51.7	
7	39.9	28.7		**7**	71.0	52.5	0.04	**7**	77.5	56.7	
8	49.7	23.5		**8**	70.8	50.1		**8**	80.3	52.4	0.59
9	54.7	25.7		**9**	61.4	46.2	0.22	**9**	60.3	49.6	
10	54.6	34.1		**10**	57.8	37.9		**10**	75.4	50.3	
11	52.2	25.4		**11**	57.4	32.9		**11**	65.1	55.3	0.15
12	54.2	27.3		**12**	68.8	34.9		**12**	73.2	49.5	
13	47.6	34.6		**13**	68.2	52.8		**13**	71.6	54.2	0.12
14	44.0	36.0	0.34	**14**	68.8	50.1	0.82	**14**	77.1	51.3	
15	62.6	41.0		**15**	64.3	46.1	0.01	**15**	81.6	49.7	
16	67.4	28.7		**16**	59.5	39.3	0.01	**16**	77.9	55.5	
17	67.2	32.4		**17**	56.5	34.1		**17**	68.3	57.9	1.25
18	71.9	35.8		**18**	64.2	33.7		**18**	79.1	55.9	
19	59.2	43.4	0.29	**19**	75.6	50.9		**19**	78.6	65.4	3.02
20	43.7	37.7	0.43	**20**	81.9	57.3		**20**	80.2	63.4	0.01
21	39.6	34.2	0.20	**21**	79.5	58.7		**21**	85.4	61.2	
22	52.2	33.5		**22**	65.9	55.5		**22**	86.8	63.6	
23	60.5	27.4		**23**	78.5	51.9		**23**	85.7	67.9	
24	83.9	53.9		**24**	78.4	59.3	0.15	**24**	92.0	67.3	
25	74.2	50.7	1.48	**25**	71.2	53.5		**25**	89.1	68.8	
26	70.2	47.0	0.85	**26**	77.2	53.1	0.19	**26**	84.6	62.8	
27	73.8	58.2	0.33	**27**	78.2	62.2	0.70	**27**	84.5	59.7	
28	60.5	43.6	0.29	**28**	62.4	48.0		**28**	76.7	62.0	0.05
29	61.8	42.5		**29**	69.0	47.8		**29**	72.2	58.5	0.04
30	64.6	49.2	0.56	**30**	71.6	44.1		**30**	65.3	57.6	0.02
				31	64.5	39.5					

TEMPERATURE AND PRECIPITATION DATA

Hudsonville

Recorded at
Michigan Celery Cooperative
Hudsonville, Michigan
2009

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	62.9	54.9		**1**	75.3	58.9	0.05	**1**	73.4	40.3	
2	65.4	49.6		**2**	72.3	53.5		**2**	76.4	44.9	
3	71.6	56.3		**3**	81.9	58.5	0.04	**3**	78.6	47.0	
4	77.2	53.6		**4**	81.3	58.5		**4**	80.0	49.0	
5	76.4	51.1		**5**	75.8	48.8		**5**	79.9	51.3	
6	76.4	52.3		**6**	77.3	49.9		**6**	78.3	53.5	
7	72.3	48.5		**7**	78.4	53.5	0.04	**7**	79.0	49.0	
8	77.2	46.0		**8**	81.0	61.6	0.84	**8**	773.0	60.6	
9	80.4	52.3		**9**	87.8	68.4	0.03	**9**	82.0	58.6	
10	79.7	57.6		**10**	80.3	67.1	2.43	**10**	79.9	60.8	
11	76.1	58.6	0.53	**11**	82.4	64.0		**11**	81.0	55.6	
12	72.9	51.3		**12**	81.7	55.7		**12**	78.6	52.4	
13	75.6	48.0		**13**	82.3	54.9		**13**	79.6	46.5	
14	77.6	47.5		**14**	84.0	58.0		**14**	81.4	53.3	
15	80.9	58.8	0.59	**15**	85.0	63.9		**15**	82.5	59.1	
16	73.7	58.6		**16**	88.4	67.8	0.43	**16**	68.5	51.8	
17	66.4	49.9	0.03	**17**	82.9	68.5	0.46	**17**	73.7	42.8	
18	67.8	48.7		**18**	78.6	59.4		**18**	80.0	43.4	
19	73.2	51.1	0.04	**19**	81.1	55.4	0.05	**19**	72.3	46.8	
20	76.6	47.0		**20**	76.0	67.4	0.15	**20**	76.0	42.8	0.01
21	80.7	53.2		**21**	72.2	59.3	0.11	**21**	69.5	56.0	0.06
22	79.0	61.8	0.70	**22**	68.6	55.9	0.09	**22**	78.7	52.8	0.06
23	74.8	59.9		**23**	70.8	54.5		**23**	75.8	60.0	
24	77.9	57.5		**24**	76.1	48.9		**24**	69.6	57.3	
25	75.3	62.5		**25**	79.2	56.3	0.33	**25**	73.4	55.5	0.07
26	72.2	58.8		**26**	77.9	61.0	1.00	**26**	66.4	53.7	
27	80.5	57.1		**27**	65.1	58.1	0.04	**27**	72.1	49.3	0.08
28	77.8	64.6		**28**	66.3	58.4	0.01	**28**	58.9	48.0	1.39
29	74.7	57.6		**29**	60.8	54.8	0.10	**29**	56.4	47.5	
30	76.0	53.8		**30**	67.7	48.3		**30**	57.3	36.6	
31	75.5	52.8		**31**	69.5	39.2					

TEMPERATURE AND PRECIPITATION DATA

Imlay City

Recorded at
Lapeer USDA/NRCS Office
Lapeer, Michigan
2009

	APRIL				MAY				JUNE		
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	54.9	36.3	0.05	**1**	60.9	40.4		**1**	72.7	44.1	0.06
2	66.0	30.6		**2**	62.8	36.3		**2**	64.5	42.2	
3	50.5	36.5	0.34	**3**	69.5	35.4		**3**	67.0	40.4	
4	51.9	32.5		**4**	65.3	36.0		**4**	70.0	34.9	
5	46.0	26.6		**5**	71.0	39.9		**5**	75.5	36.1	
6	37.6	28.4	0.57	**6**	67.5	44.8		**6**	73.4	48.3	
7	32.5	26.8	0.03	**7**	65.9	44.7	0.18	**7**	74.9	48.2	0.01
8	50.9	27.1		**8**	75.7	48.5		**8**	67.7	49.8	0.95
9	55.9	24.5		**9**	58.7	47.7	0.24	**9**	71.8	53.6	0.01
10	49.5	29.2		**10**	58.2	38.3		**10**	74.7	49.1	
11	53.1	27.2		**11**	62.3	33.6		**11**	67.5	51.4	
12	49.5	21.0		**12**	66.4	32.3		**12**	75.5	44.1	
13	47.3	26.3		**13**	67.9	46.9	0.02	**13**	70.4	50.4	0.04
14	42.5	36.5	0.3	**14**	69.3	47.7	0.61	**14**	78.7	44.6	
15	60.4	37.5	0.08	**15**	66.2	40.5		**15**	79.3	46.3	
16	63.6	27.3		**16**	64.0	44.7	0.61	**16**	79.2	47.1	
17	71.0	27.8		**17**	59.6	34.6		**17**	65.5	60.5	1.56
18	74.5	39.5		**18**	66.4	30.3		**18**	77.6	59.4	
19	57.1	40.8	0.05	**19**	75.9	49.4		**19**	79.8	58.5	0.44
20	48.7	39.3	0.82	**20**	83.7	55.5		**20**	82.9	63.6	0.26
21	49.7	36.6	0.06	**21**	83.4	58.1		**21**	79.6	58.5	
22	53.4	35.4	0.02	**22**	66.4	51.1		**22**	85.7	56.0	
23	60.8	29.8		**23**	80.4	44.4		**23**	89.2	57.8	
24	80.4	45.9		**24**	75.8	47.6	0.03	**24**	94.4	65.6	
25	80.8	48.6	0.59	**25**	68.6	39.9		**25**	86.7	67.0	0.67
26	76.9	42.9	0.08	**26**	69.2	45.1		**26**	82.5	61.1	
27	81.1	60.0	0.07	**27**	78.3	57.4	0.83	**27**	82.8	54.6	
28	60.4	40.8	0.42	**28**	64.5	52.7		**28**	79.9	63.2	0.01
29	61.7	38.8		**29**	75.8	44.6		**29**	74.0	58.2	0.04
30	63.4	48.9	0.52	**30**	71.4	38.2		**30**	66.1	56.8	0.23
				31	64.7	35.0					

TEMPERATURE AND PRECIPITATION DATA

Imlay City

Recorded at
Lapeer USDA/NRCS Office
Lapeer, Michigan
2009

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	68.6	55.0	0.12	**1**	78.8	52.4		**1**	75.9	38.8	
2	63.9	56.2	0.09	**2**	75.8	58.4		**2**	76.6	41.7	
3	72.3	57.3		**3**	80.0	50.5		**3**	79.7	43.4	
4	76.2	47.0		**4**	84.7	60.0		**4**	80.6	46.2	
5	79.8	51.0		**5**	78.3	47.7		**5**	78.9	46.9	
6	78.2	51.6	0.02	**6**	79.1	47.8		**6**	79.1	48.1	
7	69.2	50.7		**7**	79.3	49.5		**7**	76.5	55.9	
8	75.9	46.0		**8**	73.4	60.9	1.15	**8**	76.0	56.4	
9	78.8	49.3		**9**	89.8	67.9	2.93	**9**	79.9	56.1	
10	80.5	51.1		**10**	83.5	68.4	0.09	**10**	79.9	50.6	
11	81.1	57.8	0.31	**11**	82.0	63.8		**11**	78.1	52.9	
12	77.1	47.7		**12**	82.4	59.2		**12**	77.6	48.3	
13	76.6	45.4		**13**	85.0	55.7		**13**	81.5	45.4	
14	79.1	44.4		**14**	86.1	57.6		**14**	82.7	53.9	
15	80.9	57.9		**15**	86.8	59.7		**15**	81.8	54.1	
16	78.6	60.0		**16**	88.0	60.5		**16**	67.9	43.5	
17	72.0	55.7		**17**	84.0	69.1	0.06	**17**	74.9	36.4	
18	66.7	50.8	0.07	**18**	83.6	65.4	0.02	**18**	75.2	40.6	
19	77.5	51.1	0.01	**19**	81.6	56.3	0.03	**19**	69.5	33.8	
20	77.4	52.3		**20**	81.1	66.5	0.05	**20**	75.4	34.5	
21	78.5	50.6		**21**	77.3	60.6		**21**	76.3	60.6	0.77
22	78.3	60.9	0.09	**22**	65.6	54.0	0.02	**22**	80.8	63.5	0.01
23	73.0	59.9	0.02	**23**	72.6	55.9	0.03	**23**	75.6	63.3	0.03
24	80.3	57.5		**24**	78.7	50.1		**24**	73.5	48.9	
25	78.5	62.6	0.07	**25**	80.9	48.9		**25**	72.6	44.4	
26	75.1	59.5	0.31	**26**	77.0	53.6	0.51	**26**	61.1	51.7	0.05
27	82.4	57.4	0.01	**27**	71.1	51.7		**27**	71.6	56.1	0.01
28	84.4	66.2		**28**	61.2	55.8	0.24	**28**	61.2	48.9	0.84
29	79.8	58.0	0.02	**29**	69.1	56.4	0.01	**29**	56.3	46.1	0.10
30	78.7	51.0		**30**	67.9	46.6	0.10	**30**	56.1	33.8	0.01
31	79.2	55.5		**31**	71.6	40.0					

TEMPERATURE AND PRECIPITATION DATA

Momence

Recorded at
Stelle, Illinois Climate Network Station
Stelle, Illinois
2007

	APRIL				MAY				JUNE		
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	53.6	32.0	0.37	**1**	53.6	43.0		**1**	87.2	50.2	0.38
2	61.6	37.9	0.48	**2**	62.9	41.7		**2**	71.2	49.2	0.04
3	49.0	31.4	0.04	**3**	67.0	40.2		**3**	65.4	44.4	
4	51.8	29.3		**4**	68.8	42.3		**4**	70.5	40.3	
5	45.6	30.1	1.11	**5**	71.4	44.5		**5**	78.0	40.7	
6	38.6	28.0	0.09	**6**	69.6	47.9	0.47	**6**	78.4	54.4	
7	44.6	27.6		**7**	76.0	53.3	0.15	**7**	77.8	58.1	0.01
8	51.7	26.1		**8**	67.6	50.3	0.01	**8**	81.5	61.5	0.02
9	55.7	28.5		**9**	64.0	43.2		**9**	74.6	56.6	
10	45.3	32.0	0.26	**10**	67.2	38.5		**10**	77.4	55.7	0.01
11	50.1	25.1		**11**	63.8	37.3		**11**	64.1	54.2	0.61
12	55.3	25.2		**12**	68.1	38.8		**12**	73.6	54.2	
13	41.1	33.6	0.76	**13**	68.2	51.5	2.21	**13**	73.6	57.0	
14	40.1	32.9		**14**	65.3	49.3	0.07	**14**	76.3	54.6	
15	54.2	31.1		**15**	59.2	49.7	0.72	**15**	78.4	55.9	0.45
16	63.0	32.6		**16**	59.1	40.4	0.02	**16**	72.3	62.9	
17	67.9	37.2		**17**	59.8	35.4		**17**	79.0	60.4	0.29
18	71.2	42.3	0.01	**18**	64.3	36.0		**18**	80.7	59.8	0.19
19	57.9	46.2	0.57	**19**	76.2	42.9		**19**	86.6	67.8	
20	52.7	38.9	0.32	**20**	80.7	48.2		**20**	84.9	65.5	0.03
21	43.7	33.3	0.12	**21**	83.6	48.9		**21**	79.4	67.4	1.74
22	61.4	30.7		**22**	78.0	53.7		**22**	87.3	66.3	
23	67.2	34.0		**23**	83.6	53.0		**23**	90.5	69.0	
24	79.4	50.4		**24**	76.3	54.0		**24**	89.5	68.7	
25	81.6	50.1	0.05	**25**	66.4	53.8		**25**	90.2	70.1	0.17
26	81.6	47.6		**26**	81.5	56.4		**26**	85.4	64.9	
27	71.4	57.3	1.33	**27**	78.8	58.2		**27**	87.7	58.9	
28	57.4	42.4	0.18	**28**	62.3	53.4		**28**	79.5	61.8	
29	58.7	45.0		**29**	80.4	49.8		**29**	77.8	59.1	
30	68.5	53.5	0.75	**30**	81.0	43.9		**30**	69.2	55.9	
				31	78.5	44.5					

TEMPERATURE AND PRECIPITATION DATA

Momence

Recorded at
Stelle, Illinois Climate Network Station
Stelle, Illinois
2007

	JULY			AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	64.8	55.7		**1**	72.0	51.2	0.03	**1**	71.4	53.1	
2	72.3	53.9		**2**	74.7	52.6		**2**	72.2	48.4	
3	77.1	52.9		**3**	81.2	56.2		**3**	75.6	48.5	
4	65.9	59.6	0.64	**4**	78.4	60.7	0.02	**4**	76.3	52.1	
5	78.2	60.6		**5**	77.6	55.1		**5**	74.9	53.2	
6	80.0	58.1		**6**	78.6	51.4		**6**	75.4	57.7	0.05
7	79.9	60.0	0.02	**7**	72.8	54.5	0.29	**7**	76.3	54.5	
8	71.2	58.0	0.50	**8**	86.2	63.6		**8**	77.3	53.4	
9	76.6	58.1	0.16	**9**	87.9	70.3		**9**	73.6	57.8	
10	80.3	59.8		**10**	80.7	62.5		**10**	79.6	56.4	
11	80.4	62.7		**11**	80.1	57.2		**11**	78.1	56.0	
12	78.4	55.6		**12**	79.9	54.6		**12**	77.8	50.8	
13	78.5	54.5		**13**	82.5	49.6		**13**	76.8	51.1	
14	78.4	52.1		**14**	83.9	54.6		**14**	79.8	47.1	
15	82.4	63.1	0.42	**15**	85.7	57.9		**15**	81.9	54.8	
16	78.8	59.6	0.15	**16**	86.0	63.3	0.18	**16**	75.2	51.2	
17	68.1	52.1		**17**	82.1	65.2	0.44	**17**	73.3	46.4	
18	68.5	51.8		**18**	80.0	63.8		**18**	77.0	39.6	
19	71.1	54.9		**19**	78.0	58.0	0.64	**19**	75.3	51.0	
20	75.0	51.6		**20**	74.9	59.1	0.11	**20**	70.6	49.6	0.38
21	75.7	52.6		**21**	72.0	56.9	0.02	**21**	72.6	59.5	
22	73.8	57.5		**22**	68.7	52.8		**22**	77.4	60.0	0.06
23	77.5	55.4		**23**	72.8	52.4		**23**	76.0	54.5	
24	80.8	53.7	0.47	**24**	75.3	48.0		**24**	68.3	58.2	0.01
25	77.1	62.0	0.07	**25**	79	48.7		**25**	67.5	57.1	0.67
26	77.1	58.8		**26**	77.7	53.5		**26**	66.9	50.2	0.01
27	79.5	56.4		**27**	73.3	60.6	1.17	**27**	74.1	45.3	0.03
28	79.7	64.1	0.09	**28**	72.0	58.1	0.21	**28**	61.0	48.6	
29	74.6	55.0		**29**	65.9	49.9		**29**	56.8	46.7	
30	76.7	52.3		**30**	64.9	46.5		**30**	63.7	40.3	
31	77.5	53.4		**31**	66.3	42.6					

TEMPERATURE AND PRECIPITATION DATA

Benton Harbor

Recorded at
MSU Southwest MI Research and Extension Center(SWREC)
Benton Harbor, Michigan
2009

APRIL				MAY				JUNE			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	51.7	36.7		**1**	60.5	41.6	0.01	**1**	78.5	54.0	0.34
2	64.0	41.7		**2**	62.9	40.5		**2**	66.1	52.5	0.20
3	43.2	35.1	0.46	**3**	66.7	41.7		**3**	66.6	45.6	
4	44.6	30.4		**4**	69.8	49.2		**4**	68.6	41.7	
5	45.1	32.2	0.52	**5**	69.4	45.9		**5**	75.8	40.7	
6	38.0	31.1	0.16	**6**	72.9	52.8		**6**	71.5	53.6	0.08
7	41.3	30.5		**7**	74.8	53.3		**7**	77.1	63.1	
8	50.4	28.1		**8**	71.0	52.0		**8**	81.4	60.2	0.05
9	54.0	29.5		**9**	61.7	41.1		**9**	62.3	50.6	
10	53.9	36.0		**10**	62.9	40.2		**10**	75.6	50.8	
11	45.9	29.2		**11**	56.9	33.9		**11**	63.7	58.4	1.06
12	56.6	27.2		**12**	69.3	32.9		**12**	72.4	51.2	
13	44.7	36.2	0.14	**13**	68.4	51.6	0.05	**13**	64.3	54.9	0.16
14	41.2	36.1	0.12	**14**	69.1	49.3	0.29	**14**	77.4	55.5	
15	58.4	37.0		**15**	65.2	48.5	0.29	**15**	81.1	51.7	
16	63.4	35.4		**16**	59.5	41.9	0.07	**16**	76.1	61.3	0.19
17	66.7	37.6		**17**	56.7	33.5		**17**	64.6	54.9	0.14
18	71.1	41.7		**18**	67.0	33.2		**18**	79.6	53.5	
19	61.8	46.7	0.47	**19**	77.8	48.7		**19**	82.0	63.4	2.13
20	47.0	37.3	0.27	**20**	83.7	55.1		**20**	81.6	63.2	0.07
21	40.1	34.6	0.25	**21**	82.4	56.5		**21**	87.5	63.8	
22	54.4	35.6		**22**	76.5	46.2		**22**	86.7	69.9	
23	64.5	28.3		**23**	80.1	57.0		**23**	88.9	69.9	
24	84.9	55.4	0.05	**24**	77.8	58.5	0.02	**24**	89.8	69.7	
25	75.5	43.2	0.13	**25**	76.3	57.9		**25**	89.2	70.9	
26	81.6	41.7		**26**	82.5	56.0	0.91	**26**	86.0	64.2	
27	75.8	58.3	0.99	**27**	77.9	57.3	0.42	**27**	84.6	56.6	
28	59.0	43.6	0.17	**28**	57.4	49.7		**28**	79.0	62.3	
29	59.1	46.3	0.10	**29**	65.0	48.7		**29**	75.0	57.2	0.07
30	68.6	48.4	0.29	**30**	75.1	45.4		**30**	66.0	59.7	
				31	69.8	45.2					

TEMPERATURE AND PRECIPITATION DATA

Benton Harbor

Recorded at
MSU Southwest MI Research and Extension Center(SWREC)
Benton Harbor, Michigan
2009

JULY				AUGUST				SEPTEMBER			
Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.	Date	High Temp F	Low Temp F	Total Prec. in.
1	63.2	56.2	0.07	**1**	78.6	58.3	0.03	**1**	71.1	42.8	
2	65.4	55.7	0.06	**2**	75.1	61.3		**2**	75.4	47.3	
3	71.8	57.8		**3**	84.3	59.5	0.02	**3**	77.6	50.2	
4	73.2	53.6		**4**	81.5	66.7		**4**	76.4	53.2	
5	77.3	55.0		**5**	77.0	55.3		**5**	79.9	53.1	
6	79.0	54.3		**6**	76.3	51.0		**6**	78.7	59.5	
7	74.2	56.7		**7**	74.0	56.5	0.09	**7**	80.2	57.0	
8	76.5	52.2		**8**	87.8	63.4	0.30	**8**	77.5	61.2	0.05
9	82.6	59.9		**9**	93.0	72.2	0.28	**9**	77.6	62.2	0.01
10	80.7	61.4		**10**	82.7	69.4		**10**	80.8	60.5	
11	79.8	60.4	0.03	**11**	79.7	63.2		**11**	80.8	57.8	
12	75.6	55.1		**12**	77.0	58.9		**12**	77.8	55.3	
13	76.2	50.9		**13**	82.5	54.5		**13**	76.5	48.6	
14	80.3	46.8		**14**	87.4	61.8		**14**	80.3	53.1	
15	84.3	62.8	0.07	**15**	87.5	62.9		**15**	78.7	56.0	
16	78.9	65.5		**16**	91.3	68.8	0.47	**16**	71.0	52.8	
17	69.4	56.8		**17**	82.0	68.9	0.60	**17**	69.6	46.8	
18	68.2	54.3	0.01	**18**	80.2	64.8	0.01	**18**	74.0	42.2	
19	72.6	52.1	0.03	**19**	81.7	58.4	0.29	**19**	74.4	55.0	
20	77.9	51.0		**20**	76.3	66.0	0.19	**20**	78.1	50.2	
21	81.9	58.3		**21**	73.4	60.4	0.02	**21**	69.3	58.6	0.10
22	79.8	63.8		**22**	64.6	55.7	0.36	**22**	80.8	58.0	0.19
23	74.6	58.5		**23**	70.5	55.4		**23**	69.3	62.1	0.01
24	81.5	56.2		**24**	76.2	51.0		**24**	72.6	60.2	
25	78.5	64.7	0.09	**25**	80.3	58.3		**25**	73.0	57.3	
26	76.2	62.7	0.02	**26**	69.9	63.1	0.25	**26**	68.1	52.6	0.01
27	83.6	59.5		**27**	64.5	58.3	0.68	**27**	73.2	49.3	0.24
28	82.9	66.0	0.01	**28**	70.8	59.0	0.71	**28**	64.4	50.9	0.23
29	74.8	57.3		**29**	63.2	56.7	0.03	**29**	54.2	47.6	0.10
30	79.1	54.7	0.01	**30**	64.3	46.8	0.10	**30**	56.1	38.4	
31	78.2	57.2	0.01	**31**	67.6	45.8					

Weed Control in Asparagus – Hart 2009

Project Code: WC 120-09-01 **Location: Hart, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Asparagus **Variety: Millenium**
Planting Method: Transplant **Planting Date: 4/30/04**
Spacing: 12 inch **Row Spacing: 4.5 FT**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 4.5 ft wide x 40 ft long

Soil Type: Spinks Loamy Fine Sand **OM: 1.5%** **pH: 6.1**
Sand: 83.4% **Silt: 13.9%** **Clay: 2.7%** **CEC: 3.7**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	4/24/09	10:00 am	62/50	F	Dry	5 SW	50	10% Cloudy	N
PO1	5/26/09	8:30 am	52/59	F	Wet	4-7 NE	100	100% Cloudy	N
PO2	6/23/09	12:10 pm	85/81	F	Dry	2 SW	47	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/24	ASPA = asparagus		Dormant	
4/24	DAND = dandelion	2-3″		Many
4/24	FIPA = field pansy	1-4″		Moderate
4/24	HOWE = horseweed	0.5-1″	Rosette	Many
5/26	ASPA = asparagus		Green Spears	
5/26	DAND = dandelion	2-3″		Few
5/26	FIBW = field bindweed	1-3″		Many
5/26	FISB = field sandbur	1-3″		Moderate
5/26	HOWE = horseweed	2-4″	Rosette	Many
5/26	RUTH = Russian thistle	1-3″		Moderate
6/23	ASPA = asparagus		Harvested	
6/23	DAND = dandelion	3-6″		Few
6/23	FIBW = field bindweed	1-3″		Moderate
6/23	FIPA = field pansy	6-12″	Flower	Moderate
6/23	HOWE = horseweed	2-15″		Many
6/23	RUTH = Russian thistle	3-5″	Foliar	Moderate

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.

Weed Control in Asparagus – Hart 2009

Dept. of Horticulture, MSU

Trial ID: WC 120-09-01 Study Director: Dr. Bernard Zandstra
Location: Hart Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code								FISB	FIBW	HOWE	RUTH
Description							ASPARAGUS				
Rating Date							26/May/2009	26/May/2009	26/May/2009	26/May/2009	26/May/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	Untreated						1.0	5.0	4.7	5.3	8.3
	linuron	50	DF	1	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
	s-metolachlor	7.62	EC	1.9	lb ai/a	PO2					
2	s-metolachlor	7.62	EC	1.27	lb ai/a	PO1	1.0	7.7	4.0	9.0	5.7
	mesotrione	4	SC	0.094	lb ai/a	PRE, PO2					
	NIS	100	SL	0.25	% v/v	PRE, PO2					
3	s-metolachlor	7.62	EC	1.27	lb ai/a	PRE, PO2	1.0	9.0	5.0	9.3	6.3
	mesotrione	4	SC	0.188	lb ai/a	PRE, PO2					
	NIS	100	SL	0.25	% v/v	PRE, PO2					
4	pendimethalin	3.8	CS	1.14	lb ai/a	PRE, PO2	1.0	10.0	4.7	5.7	10.0
5	pendimethalin	3.8	CS	2.28	lb ai/a	PRE, PO2	1.0	10.0	3.3	8.7	10.0
6	pendimethalin	3.8	CS	4.56	lb ai/a	PRE, PO2	1.0	10.0	4.7	7.7	9.7
7	BCS AA 10717	1.67	L	0.067	lb ai/a	PRE, PO2	1.0	10.0	4.3	6.3	10.0
8	saflufenacil	70	WG	0.045	lb ai/a	PRE, PO2	1.0	4.7	6.3	6.3	10.0
9	terbacil	80	WP	1	lb ai/a	PRE, PO2	1.0	8.7	7.7	10.0	10.0
10	flumioxazin	51	WDG	0.192	lb ai/a	PRE, PO2	1.0	9.7	8.0	6.0	10.0
LSD (P=.05)							0.00	3.47	5.01	4.96	3.48
Standard Deviation							0.00	2.02	2.92	2.89	2.03
CV							0.0	23.88	55.43	38.91	22.51

Weed Control in Asparagus – Hart 2009

Dept. of Horticulture, MSU

Pest Code								FISB	DAND	FIBW	HOWE
Description							ASPARAGUS				
Rating Date							23/Jun/2009	23/Jun/2009	23/Jun/2009	23/Jun/2009	23/Jun/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	Untreated						1.7	7.3	10.0	4.3	4.0
	linuron	50	DF	1	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
	s-metolachlor	7.62	EC	1.9	lb ai/a	PO2					
2	s-metolachlor	7.62	EC	1.27	lb ai/a	PO1	1.3	3.7	10.0	4.0	7.0
	mesotrione	4	SC	0.094	lb ai/a	PRE, PO2					
	NIS	100	SL	0.25	% v/v	PRE, PO2					
3	s-metolachlor	7.62	EC	1.27	lb ai/a	PRE, PO2	1.3	6.7	7.7	4.3	7.7
	mesotrione	4	SC	0.188	lb ai/a	PRE, PO2					
	NIS	100	SL	0.25	% v/v	PRE, PO2					
4	pendimethalin	3.8	CS	1.14	lb ai/a	PRE, PO2	1.7	9.7	7.0	2.7	3.3
5	pendimethalin	3.8	CS	2.28	lb ai/a	PRE, PO2	2.3	9.7	10.0	2.3	5.7
6	pendimethalin	3.8	CS	4.56	lb ai/a	PRE, PO2	1.7	10.0	10.0	5.3	4.3
7	BCS AA 10717	1.67	L	0.067	lb ai/a	PRE, PO2	2.0	9.3	10.0	4.0	4.7
8	saflufenacil	70	WG	0.045	lb ai/a	PRE, PO2	1.7	1.7	8.3	5.7	4.3
9	terbacil	80	WP	1	lb ai/a	PRE, PO2	1.3	8.3	9.7	7.7	9.7
10	flumioxazin	51	WDG	0.192	lb ai/a	PRE, PO2	1.7	10.0	6.0	5.7	2.7
LSD (P=.05)							1.06	3.72	4.50	4.64	4.99
Standard Deviation							0.62	2.17	2.62	2.70	2.91
CV							37.24	28.45	29.59	58.77	54.57

Weed Control in Asparagus – Hart 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	RUTH	ASPARAGUS	ASPARAGUS	ASPARAGUS
Pest Code										
Description								ASPARAGUS	ASPARAGUS	ASPARAGUS
Rating Date							23/Jun/2009	13/Aug/2009	8/Sep/2009	
Rating Data Type							RATING	RATING	RATING	TOTALS
Rating Unit							1-10	1-10	1-10	KG/plot
1	Untreated						7.0	1.7	1.3	7.41
	linuron	50	DF	1	lb ai/a	PO1				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1				
	NIS	100	SL	0.25	% v/v	PO1				
	s-metolachlor	7.62	EC	1.9	lb ai/a	PO2				
2	s-metolachlor	7.62	EC	1.27	lb ai/a	PO1	4.3	2.3	1.7	7.90
	mesotrione	4	SC	0.094	lb ai/a	PRE, PO2				
	NIS	100	SL	0.25	% v/v	PRE, PO2				
3	s-metolachlor	7.62	EC	1.27	lb ai/a	PRE, PO2	4.0	2.3	1.3	8.57
	mesotrione	4	SC	0.188	lb ai/a	PRE, PO2				
	NIS	100	SL	0.25	% v/v	PRE, PO2				
4	pendimethalin	3.8	CS	1.14	lb ai/a	PRE, PO2	9.3	1.3	1.0	7.87
5	pendimethalin	3.8	CS	2.28	lb ai/a	PRE, PO2	7.0	1.0	1.0	9.86
6	pendimethalin	3.8	CS	4.56	lb ai/a	PRE, PO2	10.0	1.7	1.3	8.03
7	BCS AA 10717	1.67	L	0.067	lb ai/a	PRE, PO2	10.0	1.3	1.3	9.30
8	saflufenacil	70	WG	0.045	lb ai/a	PRE, PO2	10.0	3.0	2.0	7.65
9	terbacil	80	WP	1	lb ai/a	PRE, PO2	10.0	1.7	1.3	9.79
10	flumioxazin	51	WDG	0.192	lb ai/a	PRE, PO2	10.0	2.7	2.0	6.83
LSD (P=.05)							4.40	1.21	1.02	2.019
Standard Deviation							2.57	0.70	0.59	1.177
CV							31.41	37.08	41.38	14.14

Weed Control in Asparagus – Sandhill 2009

Project Code: WC 120-09-02 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Asparagus **Variety: Jersey Giant**
Planting Method: Crowns **Planting Date: 4/20/99**
Spacing: 12 inch **Row Spacing: 6 FT**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.33 ft wide x 50 ft long

Soil Type: Riddles Sandy Loam **OM: 1.0%** **pH: 8.1**
Sand: 83.0% **Silt: 6.0%** **Clay: 8.0%** **CEC: 13.7**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	4/17/09	3:00 pm	73/60	F	Damp	2 NW	24	0% Cloudy	N
PO1	5/21/09	10:00 am	73/65	F	Moderate	6 W	36	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/17	ASPA = asparagus		Dormant	
4/17	COCW = common chickweed	2-3″		Few
4/17	MECR = mouseear cress	3-4″	Flower	Moderate
4/17	QUGR = quackgrass	1-3″		Many
4/17	SPKW = spotted knapweed	3-4″		Moderate
4/17	WICA = wild carrot	1″		Few
5/21	ASPA = asparagus	0-6″		
5/21	COCW = common chickweed	6-10″		Few
5/21	QUGR = quackgrass	6-12″		Many
5/21	SPKW = spotted knapweed	6-8″		Moderate
5/21	WICA = wild carrot	2-4″		Moderate

Notes and Comments

1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. After final harvest, the whole field sprayed with Clarity at 0.5 lb (1pt) + Poast 0.38 (2 pt) + NIS 0.25%.

Weed Control in Asparagus – Sandhill 2009

Dept. of Horticulture, MSU

Trial ID: WC 120-09-02 Study Director: Dr. Bernard Zandstra
Location: HTRC Sandhill Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Asparagus 20/May/2009 RATING 1-10	QUGR 20/May/2009 RATING 1-10	SPKW 20/May/2009 RATING 1-10	WICA 20/May/2009 RATING 1-10	Asparagus 5/Jun/2009 RATING 1-10
1	diuron	80	DF	1.2	lb ai/a	PRE	1.7	2.7	7.0	4.7	1.7
2	metribuzin	75	DF	0.5	lb ai/a	PRE	1.3	3.0	10.0	6.7	1.3
3	diuron	80	DF	1.2	lb ai/a	PRE	1.7	5.0	7.7	8.7	1.7
	metribuzin	75	DF	0.5	lb ai/a	PRE					
4	terbacil	80	WP	1.2	lb ai/a	PRE	4.7	10.0	9.0	10.0	1.7
5	flumioxazin	51	WDG	0.192	lb ai/a	PRE	2.3	2.7	3.3	1.3	2.0
6	sulfentrazone	4	F	.375	lb ai/a	PRE	1.3	5.0	2.7	1.7	2.0
7	halosulfuron	75	WG	0.047	lb ai/a	PRE	1.0	4.3	4.3	2.0	2.0
8	mesotrione	4	SC	0.094	lb ai/a	PRE	1.7	4.0	7.0	6.7	2.3
9	diuron	80	DF	1.2	lb ai/a	PRE	1.3	5.3	5.7	2.7	1.7
	s-metolachlor	7.62	EC	1.3	lb ai/a	PRE					
10	clomazone	3	ME	1	lb ai/a	PRE	1.3	9.7	8.0	5.3	1.3
11	diuron	80	DF	1.2	lb ai/a	PRE	2.3	1.7	6.3	1.7	3.0
	mesotrione	4	SC	0.094	lb ai/a	PO1					
	COC	100	SL	1	% v/v	PO1					
	AMS	100	DF	2	% ai/v	PO1					
12	diuron	80	DF	1.2	lb ai/a	PRE	1.7	6.0	7.0	3.0	1.7
	carfentrazone	1.9	EW	0.03	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	COC	100	SL	1	% v/v	PO1					
	AMS	100	DF	2	% ai/v	PO1					
LSD (P=.05)							2.53	3.66	3.87	4.13	1.24
Standard Deviation							1.50	2.16	2.28	2.44	0.73
CV							80.42	43.75	35.15	53.81	39.31

Weed Control in Asparagus – Sandhill 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	QUGR	HOWE	SPKW	WICA	Asparagus
Pest Code							QUGR	HOWE	SPKW	WICA	
Description											Asparagus
Rating Date							5/Jun/2009	5/Jun/2009	5/Jun/2009	5/Jun/2009	
Rating Data Type							RATING	RATING	RATING	RATING	GOOD SPR
Rating Unit							1-10	1-10	1-10	1-10	TOTAL #
1	diuron	80	DF	1.2	lb ai/a	PRE	2.7	9.7	7.0	4.3	286.7
2	metribuzin	75	DF	0.5	lb ai/a	PRE	3.3	9.3	9.3	7.3	347.7
3	diuron	80	DF	1.2	lb ai/a	PRE	5.3	10.0	9.7	9.0	365.3
	metribuzin	75	DF	0.5	lb ai/a	PRE					
4	terbacil	80	WP	1.2	lb ai/a	PRE	10.0	10.0	9.7	10.0	385.7
5	flumioxazin	51	WDG	0.192	lb ai/a	PRE	3.7	5.7	5.7	3.7	250.0
6	sulfentrazone	4	F	.375	lb ai/a	PRE	5.3	6.3	2.3	1.7	354.0
7	halosulfuron	75	WG	0.047	lb ai/a	PRE	3.0	1.0	7.7	5.0	312.3
8	mesotrione	4	SC	0.094	lb ai/a	PRE	4.0	7.7	7.7	6.3	320.3
9	diuron	80	DF	1.2	lb ai/a	PRE	4.7	8.0	7.0	3.0	351.7
	s-metolachlor	7.62	EC	1.3	lb ai/a	PRE					
10	clomazone	3	ME	1	lb ai/a	PRE	9.0	3.7	9.3	1.7	343.7
11	diuron	80	DF	1.2	lb ai/a	PRE	5.7	9.7	6.7	5.7	294.0
	mesotrione	4	SC	0.094	lb ai/a	PO1					
	COC	100	SL	1	% v/v	PO1					
	AMS	100	DF	2	% ai/v	PO1					
12	diuron	80	DF	1.2	lb ai/a	PRE	6.7	10.0	4.7	4.3	354.3
	carfentrazone	1.9	EW	0.03	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	COC	100	SL	1	% v/v	PO1					
	AMS	100	DF	2	% ai/v	PO1					
LSD (P=.05)							3.66	3.03	4.55	4.69	96.61
Standard Deviation							2.16	1.79	2.69	2.77	57.05
CV							40.92	23.61	37.18	53.59	17.26

Weed Control in Asparagus – Sandhill 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Asparagus GOOD SPR KG/PLOT	Asparagus BAD SPR TOTAL #	Asparagus BAD SPR KG/PLOT	Asparagus 1/Jul/2004 GOOD SPR #	Asparagus 1/Jul/2004 GOOD SPR KG/PLOT
1	diuron	80	DF	1.2	lb ai/a	PRE	4.78	21.3	0.25	429.0	7.56
2	metribuzin	75	DF	0.5	lb ai/a	PRE	5.78	31.3	0.52	540.3	8.93
3	diuron	80	DF	1.2	lb ai/a	PRE	6.20	32.3	0.58	509.7	8.79
	metribuzin	75	DF	0.5	lb ai/a	PRE					
4	terbacil	80	WP	1.2	lb ai/a	PRE	6.32	41.7	0.75	390.3	6.66
5	flumioxazin	51	WDG	0.192	lb ai/a	PRE	3.83	40.7	0.71	436.3	7.78
6	sulfentrazone	4	F	.375	lb ai/a	PRE	6.02	30.3	0.49	511.3	8.98
7	halosulfuron	75	WG	0.047	lb ai/a	PRE	5.33	35.3	0.64	419.7	7.41
8	mesotrione	4	SC	0.094	lb ai/a	PRE	5.39	28.7	0.51	511.0	8.95
9	diuron	80	DF	1.2	lb ai/a	PRE	5.73	25.7	0.48	467.0	8.02
	s-metolachlor	7.62	EC	1.3	lb ai/a	PRE					
10	clomazone	3	ME	1	lb ai/a	PRE	5.46	36.7	0.62	487.0	8.36
11	diuron	80	DF	1.2	lb ai/a	PRE	4.73	24.7	0.44	422.0	7.36
	mesotrione	4	SC	0.094	lb ai/a	PO1					
	COC	100	SL	1	% v/v	PO1					
	AMS	100	DF	2	% ai/v	PO1					
12	diuron	80	DF	1.2	lb ai/a	PRE	5.51	48.7	0.83	493.3	9.02
	carfentrazone	1.9	EW	0.03	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	COC	100	SL	1	% v/v	PO1					
	AMS	100	DF	2	% ai/v	PO1					
LSD (P=.05)							1.576	15.74	0.318	183.04	3.297
Standard Deviation							0.930	9.30	0.188	108.09	1.947
CV							17.15	28.08	33.07	23.09	23.88

Weed Control in Asparagus – Sandhill 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Asparagus 1/Jul/2005 GOOD SPR #	Asparagus 1/Jul/2005 GOOD SPR KG/PLOT	Asparagus 1/Jul/2006 GOOD SPR #	Asparagus 1/Jul/2006 GOOD SPR KG/PLOT	Asparagus 1/Jul/2007 GOOD SPR #
Pest Code											
Description											
Rating Date							1/Jul/2005	1/Jul/2005	1/Jul/2006	1/Jul/2006	1/Jul/2007
Rating Data Type							GOOD SPR	GOOD SPR	GOOD SPR	GOOD SPR	GOOD SPR
Rating Unit							#	KG/PLOT	#	KG/PLOT	#
1	diuron	80	DF	1.2	lb ai/a	PRE	300.3	6.32	302.3	5.54	233.3
2	metribuzin	75	DF	0.5	lb ai/a	PRE	353.0	6.06	416.3	7.15	304.3
3	diuron	80	DF	1.2	lb ai/a	PRE	337.3	6.19	350.7	6.50	277.7
	metribuzin	75	DF	0.5	lb ai/a	PRE					
4	terbacil	80	WP	1.2	lb ai/a	PRE	307.7	5.59	349.7	6.50	268.7
5	flumioxazin	51	WDG	0.192	lb ai/a	PRE	286.7	5.23	321.7	5.95	249.3
6	sulfentrazone	4	F	.375	lb ai/a	PRE	353.0	6.35	372.0	6.92	305.7
7	halosulfuron	75	WG	0.047	lb ai/a	PRE	280.0	5.14	275.3	5.26	257.3
8	mesotrione	4	SC	0.094	lb ai/a	PRE	341.3	6.24	351.0	6.68	253.0
9	diuron	80	DF	1.2	lb ai/a	PRE	299.7	4.86	310.7	5.54	250.3
	s-metolachlor	7.62	EC	1.3	lb ai/a	PRE					
10	clomazone	3	ME	1	lb ai/a	PRE	304.7	4.97	340.7	5.66	298.3
11	diuron	80	DF	1.2	lb ai/a	PRE	295.0	5.28	322.7	6.13	238.0
	mesotrione	4	SC	0.094	lb ai/a	PO1					
	COC	100	SL	1	% v/v	PO1					
	AMS	100	DF	2	% ai/v	PO1					
12	diuron	80	DF	1.2	lb ai/a	PRE	321.7	6.32	342.0	6.23	254.3
	carfentrazone	1.9	EW	0.03	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	COC	100	SL	1	% v/v	PO1					
	AMS	100	DF	2	% ai/v	PO1					
LSD (P=.05)							102.42	2.454	112.52	2.129	85.24
Standard Deviation							60.48	1.449	66.45	1.257	50.34
CV							19.2	25.37	19.66	20.37	18.93

Weed Control in Asparagus – Sandhill 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Asparagus 1/Jul/2007 GOOD SPR KG/PLOT	Asparagus 1/Jul/2008 GOOD SPR #	Asparagus 1/Jul/2008 GOOD SPR KG/PLOT	Asparagus 1/Jul/2009 GOOD SPR #	Asparagus 1/Jul/2009 GOOD SPR KG/PLOT
Pest Code											
Description											
Rating Date							1/Jul/2007	1/Jul/2008	1/Jul/2008	1/Jul/2009	1/Jul/2009
Rating Data Type							GOOD SPR	GOOD SPR	GOOD SPR	GOOD SPR	GOOD SPR
Rating Unit							KG/PLOT	#	KG/PLOT	#	KG/PLOT
1	diuron	80	DF	1.2	lb ai/a	PRE	4.68	195.0	7.33	286.7	4.78
2	metribuzin	75	DF	0.5	lb ai/a	PRE	6.27	263.3	10.67	347.7	5.78
3	diuron	80	DF	1.2	lb ai/a	PRE	5.65	253.0	9.00	365.3	6.20
	metribuzin	75	DF	0.5	lb ai/a	PRE					
4	terbacil	80	WP	1.2	lb ai/a	PRE	5.42	261.0	15.33	385.7	6.32
5	flumioxazin	51	WDG	0.192	lb ai/a	PRE	5.12	200.3	11.67	250.0	3.83
6	sulfentrazone	4	F	.375	lb ai/a	PRE	6.14	256.7	11.67	354.0	6.02
7	halosulfuron	75	WG	0.047	lb ai/a	PRE	5.37	238.7	10.33	312.3	5.33
8	mesotrione	4	SC	0.094	lb ai/a	PRE	5.11	239.7	9.00	320.3	5.39
9	diuron	80	DF	1.2	lb ai/a	PRE	4.94	219.3	5.33	351.7	5.73
	s-metolachlor	7.62	EC	1.3	lb ai/a	PRE					
10	clomazone	3	ME	1	lb ai/a	PRE	5.93	254.0	10.67	343.7	5.46
11	diuron	80	DF	1.2	lb ai/a	PRE	4.85	189.7	20.33	294.0	4.73
	mesotrione	4	SC	0.094	lb ai/a	PO1					
	COC	100	SL	1	% v/v	PO1					
	AMS	100	DF	2	% ai/v	PO1					
12	diuron	80	DF	1.2	lb ai/a	PRE	5.21	211.3	27.33	354.3	5.51
	carfentrazone	1.9	EW	0.03	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	COC	100	SL	1	% v/v	PO1					
	AMS	100	DF	2	% ai/v	PO1					
LSD (P=.05)							1.706	67.37	7.797	96.61	1.576
Standard Deviation							1.008	39.78	4.605	57.05	0.930
CV							18.69	17.16	37.17	17.26	17.15

Weed Control in Asparagus – Sandhill 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage		
Pest Code								
Description							Asparagus	Asparagus
Rating Date							2004-2009	2004-2009
Rating Data Type							MEAN GOOD	MEAN GOOD
Rating Unit							#	KG/PLOT
1	diuron	80	DF	1.2	lb ai/a	PRE	291.1	6.04
2	metribuzin	75	DF	0.5	lb ai/a	PRE	370.8	7.48
3	diuron	80	DF	1.2	lb ai/a	PRE	348.9	7.05
	metribuzin	75	DF	0.5	lb ai/a	PRE		
4	terbacil	80	WP	1.2	lb ai/a	PRE	327.2	7.64
5	flumioxazin	51	WDG	0.192	lb ai/a	PRE	290.7	6.59
6	sulfentrazone	4	F	.375	lb ai/a	PRE	358.8	7.68
7	halosulfuron	75	WG	0.047	lb ai/a	PRE	297.2	6.48
8	mesotrione	4	SC	0.094	lb ai/a	PRE	336.1	6.90
9	diuron	80	DF	1.2	lb ai/a	PRE	316.4	5.74
	s-metolachlor	7.62	EC	1.3	lb ai/a	PRE		
10	clomazone	3	ME	1	lb ai/a	PRE	338.1	6.84
11	diuron	80	DF	1.2	lb ai/a	PRE	293.6	8.11
	mesotrione	4	SC	0.094	lb ai/a	PO1		
	COC	100	SL	1	% v/v	PO1		
	AMS	100	DF	2	% ai/v	PO1		
12	diuron	80	DF	1.2	lb ai/a	PRE	329.5	9.94
	carfentrazone	1.9	EW	0.03	lb ai/a	PO1		
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1		
	COC	100	SL	1	% v/v	PO1		
	AMS	100	DF	2	% ai/v	PO1		
LSD (P=.05)							96.66	2.340
Standard Deviation							57.08	1.382
CV							17.57	19.17

Weed Control in Transplanted Asparagus – Hart 2007

Project Code: WC 120-07-04 **Location: Hart, MI Res. Station**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Asparagus **Variety: Millennium**
Planting Method: Transplant **Planting Date: 6/21/07**
Spacing: 12 inch **Row Spacing: 4.5 FT**
Tillage Type: Conventional **Study Design: RCB** **Replications: 4**
Plot Size: 4.5 ft wide x 50 ft long

Soil Type: Loamy Sand **OM: 1.5%** **pH: 6.1**
Sand: 83.4% **Silt: 13.9%** **Clay: 2.7%** **CEC: 3.7**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
POT	4/24/09	11:00 am	70/52	F	Dry	6 SW	42	10% cloudy	N

Crop and Weed Information at Application

Date	Crop or Weed	Height or Diameter	Growth Stage	Density
7/12/07	ASPA = asparagus			
7/12/07	COLQ = common lambsquarters			
7/12/07	RRPW = redroot pigweed			
8/17/07	ASPA = asparagus			
8/17/07	RSFI = redstem filaree			
8/17/07	STGR = stinkgrass			
4/24/09	ASPA = asparagus		Dormant	
4/24/09	FIPA = field pansy	2-3″	Flower	Many
4/24/09	HOWE = horseweed (marestail)	0.5-1″	Rosette	Many
4/24/09	MECW = mouseear chickweed	1″	Foliar	Many
4/24/09	QUGR = quackgrass	2-3″	Foliar	Moderate
4/24/09	RSFI = redstem filaree	1-2″	Rosette	Moderate

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. 10/23/07 - All fern from each plot was harvested and weighed.
4. 10/14/08 – All ferns from each plot were harvested and weighed.
5. 2009: Apply Karmex at 1.6 lb ai 45g/gal + Spartan 4F at .375 lb ai 17.8 mL/gal PRE over whole plot (Mix 2 gallons).

Weed Control in Transplanted Asparagus – Hart 2007

Dept. of Horticulture, MSU

Trial ID: WC 120-07-04 Study Director: Dr. Bernard Zandstra
Location: Hart Investigator: Rodney Tocco, Chad Herrmann

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code								COLQ	RRPW		STGR
Description							Asparagus			Asparagus	
Rating Date							12/Jul/2007	12/Jul/2007	12/Jul/2007	17/Aug/2007	17/Aug/2007
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	diuron	80	WP	1	lb ai/a	POT	1.3	9.5	7.3	1.8	9.0
2	linuron	50	DF	1	lb ai/a	POT	1.3	10.0	8.5	1.5	8.8
3	s-metolachlor	7.62	EC	1.26	lb ai/a	POT	1.0	7.3	7.5	1.3	9.3
4	flumioxazin	51	WDG	0.128	lb ai/a	POT	2.5	9.0	8.5	2.8	9.0
5	halosulfuron	75	WG	0.047	lb ai/a	POT	1.3	10.0	8.8	1.5	7.0
6	mesotrione	4	SC	0.094	lb ai/a	POT	3.0	10.0	9.0	6.8	7.5
7	norflurazon	80	DF	3	lb ai/a	POT	1.3	9.8	8.0	1.5	9.3
8	sulfentrazone	4	F	0.25	lb ai/a	POT	3.0	9.5	9.3	3.0	7.8
9	napropamide	50	DF	2	lb ai/a	POT	1.0	8.3	6.8	1.5	10.0
10	Untreated						1.0	1.0	1.0	1.5	9.0
LSD (P=.05)							0.62	1.41	1.67	1.14	2.77
Standard Deviation							0.43	0.97	1.15	0.78	1.91
CV							25.82	11.51	15.48	34.09	22.06

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code							RSFI				
Description								Asparagus	Asparagus	Asparagus	Asparagus
Rating Date							17/Aug/2007	23/Oct/2007	23/Oct/2007	27/May/2008	14/Oct/2008
Rating Data Type							RATING	PLANTS	HARVEST	RATING	Harvest
Rating Unit							1-10	#/PLOT	KG/PLOT	1-10	#
1	diuron	80	WP	1	lb ai/a	POT	7.8	24.3	0.35	2.0	22.8
2	linuron	50	DF	1	lb ai/a	POT	7.3	24.0	0.24	1.5	22.0
3	s-metolachlor	7.62	EC	1.26	lb ai/a	POT	9.3	23.8	0.39	2.0	21.0
4	flumioxazin	51	WDG	0.128	lb ai/a	POT	9.5	24.3	0.31	2.3	20.3
5	halosulfuron	75	WG	0.047	lb ai/a	POT	7.8	25.3	0.40	1.0	23.8
6	mesotrione	4	SC	0.094	lb ai/a	POT	7.5	17.3	0.06	6.8	15.3
7	norflurazon	80	DF	3	lb ai/a	POT	7.3	24.3	0.41	1.5	22.8
8	sulfentrazone	4	F	0.25	lb ai/a	POT	8.3	22.3	0.26	2.5	20.5
9	napropamide	50	DF	2	lb ai/a	POT	10.0	23.8	0.41	1.5	23.3
10	Untreated						10.0	23.0	0.25	1.5	22.5
LSD (P=.05)							4.00	3.77	0.162	1.22	3.00
Standard Deviation							2.76	2.60	0.111	0.84	2.07
CV							32.64	11.2	36.35	37.48	9.66

Weed Control in Transplanted Asparagus – Hart 2007

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Asparagus 14/Oct/2008 Harvest KG/PLOT	Asparagus 23/Jun/2009 RATING 1-10	Asparagus 13/Aug/2009 RATING 1-10	Asparagus 8/Sep/2009 RATING 1-10	Asparagus 20/Oct/2009 Harvest #
1	diuron	80	WP	1	lb ai/a	POT	1.57	1.5	1.5	1.3	23.5
2	linuron	50	DF	1	lb ai/a	POT	1.28	1.8	1.8	1.8	22.5
3	s-metolachlor	7.62	EC	1.26	lb ai/a	POT	1.58	1.5	1.8	1.5	22.0
4	flumioxazin	51	WDG	0.128	lb ai/a	POT	1.33	1.3	2.0	2.0	20.8
5	halosulfuron	75	WG	0.047	lb ai/a	POT	1.78	1.3	1.3	1.0	23.0
6	mesotrione	4	SC	0.094	lb ai/a	POT	0.40	4.8	3.0	5.0	15.3
7	norflurazon	80	DF	3	lb ai/a	POT	2.13	1.0	1.0	1.0	23.0
8	sulfentrazone	4	F	0.25	lb ai/a	POT	1.16	2.0	1.8	2.3	20.3
9	napropamide	50	DF	2	lb ai/a	POT	1.57	1.8	1.8	1.3	22.3
10	Untreated						1.32	1.5	1.5	1.5	23.3
LSD (P=.05)							0.490	1.12	0.93	1.04	3.03
Standard Deviation							0.338	0.77	0.64	0.72	2.09
CV							23.91	42.28	37.13	38.78	9.67

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Asparagus 20/Oct/2009 Harvest KG/PLOT
1	diuron	80	WP	1	lb ai/a	POT	4.20
2	linuron	50	DF	1	lb ai/a	POT	3.34
3	s-metolachlor	7.62	EC	1.26	lb ai/a	POT	4.35
4	flumioxazin	51	WDG	0.128	lb ai/a	POT	3.51
5	halosulfuron	75	WG	0.047	lb ai/a	POT	4.29
6	mesotrione	4	SC	0.094	lb ai/a	POT	1.42
7	norflurazon	80	DF	3	lb ai/a	POT	6.22
8	sulfentrazone	4	F	0.25	lb ai/a	POT	3.64
9	napropamide	50	DF	2	lb ai/a	POT	4.50
10	Untreated						4.58
LSD (P=.05)							1.556
Standard Deviation							1.073
CV							26.79

Weed Control in Transplanted Asparagus – Hart 2008

Project Code: WC 120-08-03 **Location: Hart, MI Res. Station**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Asparagus **Variety: Millennium**
Planting Method: Transplant **Planting Date: 6/20/08**
Spacing: 12 inch **Row Spacing: 4.5 FT**
Tillage Type: Conventional **Study Design: RCB** **Replications: 4**
Plot Size: 4.5 ft wide x 40 ft long

Soil Type: Spinks Loamy Fine Sand **OM: 1.4%** **pH: 6.7**
Sand: 84.0% **Silt: 12.0%** **Clay: 4.0%** **CEC: 6.1**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	6/20/08	12:30 pm	80/72	F	Good	2 E	56	20% Cloudy	N
PO1	7/18/08	10:00 am	75/70	F	Dry	5 SW	80	100% Cloudy	N
PO2	7/30/08	3:40 pm	86/93	F	Dry	8 W	56	5% Cloudy	N
PO3	8/26/08	2:00 pm	75/72	F	Dry	5 NE	33	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
6/20	ASPA = asparagus	10-12″		
7/18	ASPA = asparagus	6-8″		Stand Good
7/18	COPU = common purslane	0.5-1″		Few
7/18	LACG = Large crabgrass	1-2″		Few
7/18	RRPW = redroot pigweed	0.5-2″		Many
7/30	ASPA = asparagus	12-16″		
7/30	HANS = hairy nightshade	3-4″		Few
7/30	LACG = large crabgrass	2-5″		Some
7/30	RRPW = redroot pigweed	2-6″		Many

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. 2009: April 20th, Field was cultivated to fill furrows. No weeds present at 4-24-2009.
4. 2009: June 23rd, Lorox @ 1 lb + Poast @ 0.19 lb + NIS @ 0.25 lb.
5. 2009: August 13th, Lorox @ 1 lb + Poast @ 0.19 lb + NIS @ 0.25 lb.

Weed Control in Transplanted Asparagus – Hart 2008

Dept. Of Horticulture, MSU

Trial ID: WC 120-08-03 Study Director: Dr. Bernard Zandstra
Location: HART Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage				
Pest Code								LACG	COPU	RRPW	
Description							ASPARAGUS				ASPARAGUS
Rating Date							18/Jul/2008	18/Jul/2008	18/Jul/2008	18/Jul/2008	30/Jul/2008
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	diuron	80	DF	1	lb ai/a	POT	1.8	7.3	6.5	6.3	2.8
2	linuron	50	DF	1	lb ai/a	POT	2.5	9.5	8.5	6.5	2.8
	halosulfuron	75	WG	0.0155	lb ai/a	PO1					
	linuron	50	DF	0.156	lb ai/a	PO2					
	halosulfuron	75	WG	0.023	lb ai/a	PO3					
3	s-metolachlor	7.62	EC	1.26	lb ai/a	POT	2.5	9.5	9.3	9.0	5.3
4	flumioxazin	51	WDG	0.128	lb ai/a	POT	8.3	10.0	10.0	10.0	7.5
5	halosulfuron	75	WG	0.047	lb ai/a	POT	1.0	8.0	9.8	9.3	1.3
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
6	mesotrione	4	SC	0.094	lb ai/a	POT	5.0	9.3	7.5	8.5	5.4
7	norflurazon	80	DF	3	lb ai/a	POT	1.5	10.0	9.8	6.5	4.0
	linuron	50	DF	0.156	lb ai/a	PO1					
	linuron	50	DF	0.156	lb ai/a	PO2					
	linuron	50	DF	0.188	lb ai/a	PO3					
8	sulfentrazone	4	F	0.25	lb ai/a	POT	5.8	10.0	10.0	9.8	7.0
	pendimethalin	3.8	CS	1.6	lb ai/a	PO1					
9	napropamide	50	DF	2	lb ai/a	POT	3.0	9.3	8.5	7.5	3.5
	metribuzin	75	DF	0.123	lb ai/a	PO1					
	metribuzin	75	DF	0.123	lb ai/a	PO2					
	metribuzin	75	DF	0.15	lb ai/a	PO3					
10	Untreated						1.3	7.3	5.0	4.8	1.0
LSD (P=.05)							1.94	2.93	2.57	2.47	1.58
Standard Deviation							1.34	2.02	1.77	1.70	1.08
CV							41.15	22.47	20.93	21.85	26.85

Weed Control in Transplanted Asparagus – Hart 2008

Dept. Of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	LACG	STGR	COLQ	COPU	RRPW
Pest Code							LACG	STGR	COLQ	COPU	RRPW
Description											
Rating Date							30/Jul/2008	30/Jul/2008	30/Jul/2008	30/Jul/2008	30/Jul/2008
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	diuron	80	DF	1	lb ai/a	POT	5.0	8.3	10.0	7.5	4.3
2	linuron	50	DF	1	lb ai/a	POT	5.8	7.0	9.3	4.5	7.8
	halosulfuron	75	WG	0.0155	lb ai/a	PO1					
	linuron	50	DF	0.156	lb ai/a	PO2					
	halosulfuron	75	WG	0.023	lb ai/a	PO3					
3	s-metolachlor	7.62	EC	1.26	lb ai/a	POT	10.0	10.0	9.3	7.3	5.8
4	flumioxazin	51	WDG	0.128	lb ai/a	POT	9.3	10.0	10.0	9.5	9.5
5	halosulfuron	75	WG	0.047	lb ai/a	POT	7.8	9.8	9.8	6.8	10.0
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
6	mesotrione	4	SC	0.094	lb ai/a	POT	8.0	10.0	10.0	7.3	6.0
7	norflurazon	80	DF	3	lb ai/a	POT	10.0	10.0	9.8	9.8	4.8
	linuron	50	DF	0.156	lb ai/a	PO1					
	linuron	50	DF	0.156	lb ai/a	PO2					
	linuron	50	DF	0.188	lb ai/a	PO3					
8	sulfentrazone	4	F	0.25	lb ai/a	POT	8.0	10.0	10.0	9.3	9.0
	pendimethalin	3.8	CS	1.6	lb ai/a	PO1					
9	napropamide	50	DF	2	lb ai/a	POT	8.0	9.3	10.0	7.8	5.8
	metribuzin	75	DF	0.123	lb ai/a	PO1					
	metribuzin	75	DF	0.123	lb ai/a	PO2					
	metribuzin	75	DF	0.15	lb ai/a	PO3					
10	Untreated						1.0	1.0	1.0	1.0	1.0
LSD (P=.05)							2.77	2.51	0.74	1.45	2.44
Standard Deviation							1.91	1.73	0.51	1.00	1.68
CV							26.26	20.29	5.72	14.18	26.33

Weed Control in Transplanted Asparagus – Hart 2008

Dept. Of Horticulture, MSU

Pest Code							HANS		LACG	HANS	RRPW
Description								ASPARAGUS			
Rating Date							30/Jul/2008	26/Aug/2008	26/Aug/2008	26/Aug/2008	26/Aug/2008
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	diuron	80	DF	1	lb ai/a	POT	8.8	1.0	3.8	5.0	4.0
2	linuron	50	DF	1	lb ai/a	POT	7.3	1.8	4.3	4.8	7.5
	halosulfuron	75	WG	0.0155	lb ai/a	PO1					
	linuron	50	DF	0.156	lb ai/a	PO2					
	halosulfuron	75	WG	0.023	lb ai/a	PO3					
3	s-metolachlor	7.62	EC	1.26	lb ai/a	POT	9.5	1.8	8.8	6.8	5.3
4	flumioxazin	51	WDG	0.128	lb ai/a	POT	9.3	4.0	7.8	6.5	8.5
5	halosulfuron	75	WG	0.047	lb ai/a	POT	9.0	1.3	6.3	7.3	9.8
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
6	mesotrione	4	SC	0.094	lb ai/a	POT	9.5	3.0	5.0	8.3	5.0
7	norflurazon	80	DF	3	lb ai/a	POT	10.0	2.5	8.8	9.5	4.8
	linuron	50	DF	0.156	lb ai/a	PO1					
	linuron	50	DF	0.156	lb ai/a	PO2					
	linuron	50	DF	0.188	lb ai/a	PO3					
8	sulfentrazone	4	F	0.25	lb ai/a	POT	10.0	4.5	4.5	9.5	6.5
	pendimethalin	3.8	CS	1.6	lb ai/a	PO1					
9	napropamide	50	DF	2	lb ai/a	POT	9.3	2.0	8.5	6.8	6.3
	metribuzin	75	DF	0.123	lb ai/a	PO1					
	metribuzin	75	DF	0.123	lb ai/a	PO2					
	metribuzin	75	DF	0.15	lb ai/a	PO3					
10	Untreated						1.0	1.5	3.8	7.8	1.8
LSD (P=.05)							1.79	1.38	4.11	4.29	3.31
Standard Deviation							1.23	0.95	2.83	2.96	2.28
CV							14.74	40.87	46.22	41.11	38.55

Weed Control in Transplanted Asparagus – Hart 2008

Dept. Of Horticulture, MSU

Pest Code							STGR	TUPW		STGR	LACG
Description									ASPARAGUS		
Rating Date							26/Aug/2008	26/Aug/2008	11/Sep/2008	11/Sep/2008	11/Sep/2008
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	diuron	80	DF	1	lb ai/a	POT	5.8	5.8	2.8	6.0	5.0
2	linuron	50	DF	1	lb ai/a	POT	5.5	10.0	2.8	5.8	5.5
	halosulfuron	75	WG	0.0155	lb ai/a	PO1					
	linuron	50	DF	0.156	lb ai/a	PO2					
	halosulfuron	75	WG	0.023	lb ai/a	PO3					
3	s-metolachlor	7.62	EC	1.26	lb ai/a	POT	9.3	6.8	3.3	9.3	9.8
4	flumioxazin	51	WDG	0.128	lb ai/a	POT	9.5	10.0	7.0	9.3	8.8
5	halosulfuron	75	WG	0.047	lb ai/a	POT	9.0	10.0	2.0	9.0	7.8
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
6	mesotrione	4	SC	0.094	lb ai/a	POT	8.0	10.0	4.8	9.0	6.5
7	norflurazon	80	DF	3	lb ai/a	POT	10.0	10.0	4.8	10.0	9.3
	linuron	50	DF	0.156	lb ai/a	PO1					
	linuron	50	DF	0.156	lb ai/a	PO2					
	linuron	50	DF	0.188	lb ai/a	PO3					
8	sulfentrazone	4	F	0.25	lb ai/a	POT	8.0	10.0	7.0	9.8	6.3
	pendimethalin	3.8	CS	1.6	lb ai/a	PO1					
9	napropamide	50	DF	2	lb ai/a	POT	10.0	10.0	3.5	9.8	8.5
	metribuzin	75	DF	0.123	lb ai/a	PO1					
	metribuzin	75	DF	0.123	lb ai/a	PO2					
	metribuzin	75	DF	0.15	lb ai/a	PO3					
10	Untreated						5.3	10.0	1.5	3.8	3.3
LSD (P=.05)							3.52	2.83	2.16	3.44	3.44
Standard Deviation							2.43	1.95	1.49	2.37	2.37
CV							30.24	21.07	38.0	29.11	33.59

Weed Control in Transplanted Asparagus – Hart 2008

Dept. Of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage				
Pest Code							RRPW			
Description								ASPARAGUS	ASPARAGUS	ASPARAGUS
Rating Date							11/Sep/2008	14/Oct/2008	14/Oct/2008	23/Jun/2009
Rating Data Type							RATING	Harvest	Harvest	RATING
Rating Unit							1-10	# Ferns	KG/PLOT	1-10
1	diuron	80	DF	1	lb ai/a	POT	5.0	20.8	0.05	2.8
2	linuron	50	DF	1	lb ai/a	POT	9.0	22.0	0.05	2.8
	halosulfuron	75	WG	0.0155	lb ai/a	PO1				
	linuron	50	DF	0.156	lb ai/a	PO2				
	halosulfuron	75	WG	0.023	lb ai/a	PO3				
3	s-metolachlor	7.62	EC	1.26	lb ai/a	POT	6.8	21.5	0.07	3.0
4	flumioxazin	51	WDG	0.128	lb ai/a	POT	9.3	11.0	0.02	5.8
5	halosulfuron	75	WG	0.047	lb ai/a	POT	9.5	24.5	0.10	1.0
	halosulfuron	75	WG	0.023	lb ai/a	PO1				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1				
6	mesotrione	4	SC	0.094	lb ai/a	POT	5.3	16.3	0.04	4.3
7	norflurazon	80	DF	3	lb ai/a	POT	5.8	19.0	0.04	3.8
	linuron	50	DF	0.156	lb ai/a	PO1				
	linuron	50	DF	0.156	lb ai/a	PO2				
	linuron	50	DF	0.188	lb ai/a	PO3				
8	sulfentrazone	4	F	0.25	lb ai/a	POT	8.0	12.3	0.03	5.3
	pendimethalin	3.8	CS	1.6	lb ai/a	PO1				
9	napropamide	50	DF	2	lb ai/a	POT	7.8	22.0	0.05	3.5
	metribuzin	75	DF	0.123	lb ai/a	PO1				
	metribuzin	75	DF	0.123	lb ai/a	PO2				
	metribuzin	75	DF	0.15	lb ai/a	PO3				
10	Untreated						1.8	22.3	0.07	2.3
LSD (P=.05)							2.78	5.22	0.039	2.10
Standard Deviation							1.91	3.60	0.027	1.45
CV							28.15	18.78	53.61	42.34

Weed Control in Transplanted Asparagus – Hart 2008

Dept. Of Horticulture, MSU

Pest Code							ASPARAGUS	ASPARAGUS	ASPARAGUS	ASPARAGUS
Description										
Rating Date							13/Aug/2009	8/Sep/2009	20/Oct/2009	20/Oct/2009
Rating Data Type							RATING	RATING	Harvest	Harvest
Rating Unit							1-10	1-10	# Ferns	KG/PLOT
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage				
1	diuron	80	DF	1	lb ai/a	POT	2.3	5.0	18.5	0.19
2	linuron	50	DF	1	lb ai/a	POT	1.5	3.8	15.5	0.19
	halosulfuron	75	WG	0.0155	lb ai/a	PO1				
	linuron	50	DF	0.156	lb ai/a	PO2				
	halosulfuron	75	WG	0.023	lb ai/a	PO3				
3	s-metolachlor	7.62	EC	1.26	lb ai/a	POT	2.0	2.3	19.3	0.36
4	flumioxazin	51	WDG	0.128	lb ai/a	POT	2.3	5.0	10.3	0.10
5	halosulfuron	75	WG	0.047	lb ai/a	POT	1.5	2.0	20.3	0.40
	halosulfuron	75	WG	0.023	lb ai/a	PO1				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1				
6	mesotrione	4	SC	0.094	lb ai/a	POT	2.0	5.5	12.0	0.12
7	norflurazon	80	DF	3	lb ai/a	POT	2.5	2.8	18.3	0.32
	linuron	50	DF	0.156	lb ai/a	PO1				
	linuron	50	DF	0.156	lb ai/a	PO2				
	linuron	50	DF	0.188	lb ai/a	PO3				
8	sulfentrazone	4	F	0.25	lb ai/a	POT	2.5	5.5	11.0	0.14
	pendimethalin	3.8	CS	1.6	lb ai/a	PO1				
9	napropamide	50	DF	2	lb ai/a	POT	2.0	3.8	17.5	0.11
	metribuzin	75	DF	0.123	lb ai/a	PO1				
	metribuzin	75	DF	0.123	lb ai/a	PO2				
	metribuzin	75	DF	0.15	lb ai/a	PO3				
10	Untreated						1.8	2.5	19.5	0.27
LSD (P=.05)							1.13	2.31	6.90	0.232
Standard Deviation							0.78	1.59	4.75	0.160
CV							38.46	41.82	29.34	72.65

Weed Control in Snap Bean – HTRC 2009

Project Code: WC 125-09-01 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Snap Bean **Variety: Hercules**
Planting Method: Seeded **Planting Date: 6/2/09**
Spacing: 3 inch **Row Spacing: 14 inch; 3 rows/plot**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.3 ft wide x 30 ft long

Soil Type: Capac Loam **OM: 1.6%** **pH: 5.5**
Sand: 76.4% **Silt: 14.9%** **Clay: 8.7%** **CEC: 7.1**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	6/3/09	11:00 am	63/64	F	Damp	5-7 NE	53	100% cloudy	N
PO1	6/25/09	9:00 am	80/71	F	Dry	1-3 W	69	7% cloudy	N

Crop and Weed Information at Application

Date	Crop or Weed	Height or Diameter	Growth Stage	Density
6/3	SNBE = snap bean		Planted	
6/25	SNBE = snap bean	4-6″	1-2 Trifoliate	
6/25	CORW = common ragweed	1-4″		Many
6/25	RRPW = redroot pigweed	1-2″		Moderate
6/25	COLQ = common lambsquarters	1-3″		Moderate
6/25	LAGR = large crabgrass	2-4″		Moderate

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. Planted 3 rows of snap bean per plot 14 inches apart.
4. Harvested all plants in plot.

Weed Control in Snap Bean – HTRC 2009

Dept. of Horticulture, MSU

Trial ID: WC 125-09-01 Study Director: Dr. Bernard Zandstra
Location: HTRC Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Snap Bean 25/Jun/09 RATING 1-10	LACG 25/Jun/09 RATING 1-10	COLQ 25/Jun/09 RATING 1-10	CORW 25/Jun/09 RATING 1-10	RRPW 25/Jun/09 RATING 1-10	Snap Bean 6/Jul/09 RATING 1-10
1	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	2.7	9.3	8.3	1.3	8.3	2.3
2	s-metolachlor	7.62	EC	1.26	lb ai/a	PO1	1.0	1.0	1.0	1.0	1.0	2.0
3	fomesafen	2	EC	0.25	lb ai/a	PRE	3.0	8.7	10.0	10.0	10.0	1.7
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	6.0	10.0	10.0	10.0	10.0	3.0
	fomesafen	2	EC	0.25	lb ai/a	PRE						
5	Prefix	5.29	L	1	qt/a	PRE	4.3	10.0	10.0	10.0	10.0	2.0
6	pendimethalin	3.8	CS	1.42	lb ai/a	PRE	6.7	9.0	10.0	4.7	8.7	2.7
7	clomazone	3	ME	0.25	lb ai/a	PRE	6.0	10.0	9.3	3.3	9.3	2.0
8	imazethapyr	2	EC	0.031	lb ai/a	PRE	4.0	7.3	9.7	4.0	7.0	1.0
9	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	6.0	9.3	9.7	10.0	10.0	2.0
	halosulfuron	75	WG	0.023	lb ai/a	PRE						
10	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	5.0	10.0	8.7	1.0	8.0	2.7
	imazamox	1	AS	0.031	lb ai/a	PO1						
	bentazon	4	L	0.25	lb ai/a	PO1						
	NIS	100	SL	0.25	% v/v	PO1						
11	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	5.7	9.7	8.7	1.7	9.0	1.7
	halosulfuron	75	WG	0.023	lb ai/a	PO1						
12	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	4.3	9.7	9.3	3.3	8.3	1.7
	bentazon	4	L	1	lb ai/a	PO1						
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1						
	NIS	100	SL	0.25	% v/v	PO1						
13	Untreated					PRE	2.3	1.0	1.0	1.0	1.0	1.0
	bentazon	4	L	1	lb ai/a	PO1						
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1						
LSD (P=.05)							2.42	1.36	0.94	3.68	1.87	1.23
Standard Deviation							1.44	0.80	0.56	2.18	1.11	0.73
CV							32.82	9.96	6.9	46.24	14.36	36.87

Weed Control in Snap Bean – HTRC 2009

Dept. of Horticulture, MSU

Pest Code							BYGR	COLQ	CORW	GRFT		BYGR
Description											Snap Bean	
Rating Date							6/Jul/09	6/Jul/09	6/Jul/09	6/Jul/09	24/Jul/09	24/Jul/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage						
1	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	9.7	8.7	7.0	9.3	1.7	8.7
2	s-metolachlor	7.62	EC	1.26	lb ai/a	PO1	2.3	3.0	1.0	2.7	4.0	2.7
3	fomesafen	2	EC	0.25	lb ai/a	PRE	9.0	9.7	10.0	9.0	1.3	5.0
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	10.0	10.0	9.7	10.0	2.0	10.0
	fomesafen	2	EC	0.25	lb ai/a	PRE						
5	Prefix	5.29	L	1	qt/a	PRE	10.0	10.0	9.7	10.0	1.3	10.0
6	pendimethalin	3.8	CS	1.42	lb ai/a	PRE	9.7	9.3	6.7	9.7	3.3	9.7
7	clomazone	3	ME	0.25	lb ai/a	PRE	10.0	8.3	7.3	10.0	1.7	9.0
8	imazethapyr	2	EC	0.031	lb ai/a	PRE	8.7	9.7	9.0	9.0	1.0	5.7
9	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	10.0	9.0	10.0	10.0	1.0	9.7
	halosulfuron	75	WG	0.023	lb ai/a	PRE						
10	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	10.0	9.7	8.3	10.0	2.3	10.0
	imazamox	1	AS	0.031	lb ai/a	PO1						
	bentazon	4	L	0.25	lb ai/a	PO1						
	NIS	100	SL	0.25	% v/v	PO1						
11	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	10.0	6.7	9.3	10.0	2.0	10.0
	halosulfuron	75	WG	0.023	lb ai/a	PO1						
12	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	10.0	10.0	5.7	10.0	1.3	10.0
	bentazon	4	L	1	lb ai/a	PO1						
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1						
	NIS	100	SL	0.25	% v/v	PO1						
13	Untreated					PRE	4.7	9.7	4.7	5.0	1.7	5.3
	bentazon	4	L	1	lb ai/a	PO1						
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1						
LSD (P=.05)							1.96	1.66	2.66	2.01	1.22	3.22
Standard Deviation							1.16	0.98	1.58	1.19	0.73	1.91
CV0							13.28	11.26	20.89	13.54	38.29	23.49

Weed Control in Snap Bean – HTRC 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	LACG	CORW	GRFT	Snap Bean	Snap Bean
Pest Code							LACG	CORW	GRFT		
Description										Snap Bean	Snap Bean
Rating Date							24/Jul/09	24/Jul/09	24/Jul/09	7/Aug/09	7/Aug/09
Rating Data Type							RATING	RATING	RATING	PLANTWEIGHT	POD WEIGHT
Rating Unit							1-10	1-10	1-10	KG	KG
1	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	9.0	6.0	8.7	8.66	8.28
2	s-metolachlor	7.62	EC	1.26	lb ai/a	PO1	1.7	1.7	2.3	5.45	5.08
3	fomesafen	2	EC	0.25	lb ai/a	PRE	8.7	10.0	8.0	13.41	13.07
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	9.7	9.3	9.7	10.91	11.67
	fomesafen	2	EC	0.25	lb ai/a	PRE					
5	Prefix	5.29	L	1	qt/a	PRE	9.7	9.0	9.0	13.65	13.45
6	pendimethalin	3.8	CS	1.42	lb ai/a	PRE	9.3	5.3	8.3	6.39	6.74
7	clomazone	3	ME	0.25	lb ai/a	PRE	9.3	6.3	10.0	10.60	9.23
8	imazethapyr	2	EC	0.031	lb ai/a	PRE	5.7	6.7	5.0	11.04	10.18
9	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	9.7	9.3	9.3	14.34	14.03
	halosulfuron	75	WG	0.023	lb ai/a	PRE					
10	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	9.7	4.0	10.0	9.66	8.89
	imazamox	1	AS	0.031	lb ai/a	PO1					
	bentazon	4	L	0.25	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
11	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	10.0	9.7	9.3	12.81	12.29
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
12	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	9.7	4.3	9.7	12.23	11.15
	bentazon	4	L	1	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
13	Untreated					PRE	4.0	2.7	3.3	8.57	7.36
	bentazon	4	L	1	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
LSD (P=.05)							3.29	2.40	2.68	3.285	3.557
Standard Deviation							1.95	1.42	1.59	1.949	2.111
CV							23.92	21.96	20.16	18.4	20.88

Weed Control in Beet, Chard, Spinach – HTRC 2009

Project Code: WC 109-09-01 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Red Beet, Chard, Spinach, Sugar Beet **Variety: See notes.**
Planting Method: seed **Planting Date: 5/5/09**
Spacing: 3 inch in row **Row Spacing: 14 inch**
Tillage Type: Conventional **Study Design: RCB Replications: 3**
Plot Size: 5.3 ft wide x 35 ft long

Soil Type: Capac Loam **OM: 1.6%** **pH: 5.5**
Sand: 76.4% **Silt: 14.9%** **Clay: 8.7%** **CEC: 7.1**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	5/5/09	12:00 pm	73/58	F	Damp	3.5 SW	48.7	40% Cloudy	N
PO1	5/28/09	1:30 pm	58/64	F	Wet	4-6 W	85.3	100% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/28	Beets, Chard, Spinach		Newly Emerged	
5/28	BYGR = barnyardgrass	2-4″		
5/28	CORW = common ragweed	1-2″		Many
5/28	QUGR = quackgrass	6-10″		Few
5/28	RRPW = redroot pigweed	1-2″		Many
5/28	YENS = yellow nutsedge	2-4″		Few

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. Apply PRE treatments just before a rain.
4. 2009: June 15th, Guards and extra rows treated with: Progress @ 1.13 pt/A = 28 mL/gal + Upbeet @ 15g/A = 7 g/gal, and Poast @ 0.19 lb/A = 26 mL + Stinger @ 0.095 lb/A = 6 mL/gal.
5. 2009: June 22nd, Guards and extra rows sprayed with Treatment 8 + Upbeet.
6. Variety: Ruby Queen, Fordhook Giant, Unipack 151, Crystal.
7. Spinach not harvested because of poor stand.

Weed Control in Beet, Chard, Spinach – HTRC 2009

Dept. of Horticulture, MSU

Trial ID: WC 109-09-01 Study Director: Dr. Bernard Zandstra
Location: HTRC Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	REDBEET 29/May/2009 RATING 1-10	CHARD 29/May/2009 RATING 1-10	SPINACH 29/May/2009 RATING 1-10	SUGBEET 29/May/2009 RATING 1-10	BYGR 29/May/2009 RATING 1-10
1	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	5.7	4.3	5.3	5.0	10.0
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
2	dimethenamid-p	6	EC	0.6	lb ai/a	PRE	5.7	4.3	7.7	6.7	10.0
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
3	ethofumesate	4	SC	2	lb ai/a	PRE	3.7	2.3	9.0	6.3	10.0
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
4	pyrazon	68	DF	3	lb ai/a	PRE	4.7	3.3	7.3	6.0	8.7
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
5	cycloate	6	EC	3	lb ai/a	PRE	4.3	4.0	5.0	5.0	10.0
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
6	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	3.7	3.7	5.3	5.7	10.0
	phenmediphan	1.3	L	1	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
7	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	4.3	3.3	5.7	5.7	10.0
	pyrazon	68	DF	2	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
8	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	4.0	3.0	5.3	5.3	10.0
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	clopyralid	3	EC	0.095	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
9	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	4.7	4.0	5.7	6.0	10.0
	ethofumesate	4	SC	1	lb ai/a	PO1					
	trifluralin	50	WDG	0.156	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
10	Untreated					PRE	1.7	1.7	2.7	3.0	3.0
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
LSD (P=.05)							1.76	1.49	2.50	2.52	2.20
Standard Deviation							1.03	0.87	1.46	1.47	1.28
CV							24.23	25.63	24.67	26.88	13.99

Weed Control in Beet, Chard, Spinach – HTRC 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	COLQ	CORW	LATH	REDBEET	CHARD
Pest Code											
Description											
Rating Date							29/May/2009	29/May/2009	29/May/2009	15/Jun/2009	15/Jun/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	10.0	7.0	10.0	5.3	5.0
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
2	dimethenamid-p	6	EC	0.6	lb ai/a	PRE	10.0	8.3	10.0	6.3	5.3
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
3	ethofumesate	4	SC	2	lb ai/a	PRE	9.3	6.7	10.0	3.3	2.7
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
4	pyrazon	68	DF	3	lb ai/a	PRE	10.0	10.0	10.0	3.3	4.7
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
5	cycloate	6	EC	3	lb ai/a	PRE	10.0	7.3	9.7	4.3	4.0
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
6	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	9.7	6.0	10.0	6.0	5.3
	phenmediphan	1.3	L	1	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
7	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	9.3	6.3	10.0	5.0	5.3
	pyrazon	68	DF	2	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
8	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	9.7	6.0	10.0	7.0	5.3
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	clopyralid	3	EC	0.095	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
9	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	9.7	6.3	10.0	5.3	5.0
	ethofumesate	4	SC	1	lb ai/a	PO1					
	trifluralin	50	WDG	0.156	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
10	Untreated					PRE	2.3	1.0	3.0	1.7	1.7
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
LSD (P=.05)							1.39	2.01	1.94	3.92	3.65
Standard Deviation							0.81	1.17	1.13	2.28	2.13
CV							9.0	18.03	12.2	47.89	47.97

Weed Control in Beet, Chard, Spinach – HTRC 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	SUGBEET	BYGR	COLQ	CORW	LATH
Pest Code								BYGR	COLQ	CORW	LATH
Description							SUGBEET				
Rating Date							15/Jun/2009	15/Jun/2009	15/Jun/2009	15/Jun/2009	15/Jun/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	4.3	10.0	10.0	10.0	10.0
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
2	dimethenamid-p	6	EC	0.6	lb ai/a	PRE	3.3	10.0	10.0	10.0	10.0
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
3	ethofumesate	4	SC	2	lb ai/a	PRE	2.3	9.3	9.3	8.0	10.0
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
4	pyrazon	68	DF	3	lb ai/a	PRE	4.7	10.0	10.0	10.0	10.0
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
5	cycloate	6	EC	3	lb ai/a	PRE	6.0	10.0	10.0	7.7	10.0
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
6	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	3.0	10.0	10.0	9.7	10.0
	phenmediphan	1.3	L	1	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
7	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	3.7	10.0	10.0	8.7	10.0
	pyrazon	68	DF	2	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
8	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	2.3	10.0	10.0	9.7	9.7
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	clopyralid	3	EC	0.095	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
9	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	3.3	10.0	10.0	9.3	10.0
	ethofumesate	4	SC	1	lb ai/a	PO1					
	trifluralin	50	WDG	0.156	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
10	Untreated					PRE	3.7	10.0	10.0	7.0	10.0
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
LSD (P=.05)							3.53	0.63	0.63	3.47	0.31
Standard Deviation							2.06	0.37	0.37	2.02	0.18
CV							56.14	3.68	3.68	22.46	1.83

Weed Control in Beet, Chard, Spinach – HTRC 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CHARD 20/Jul/2009 HARVEST KG	REDBEET 29/Jul/2009 # ROOTS #/PLOT	REDBEET 29/Jul/2009 WEIGHT KG	SUGBEET 16/Oct/2009 # ROOTS #/PLOT	SUGBEET 16/Oct/2009 WEIGHT KG
1	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	6.21	24.7	4.81	17.3	32.37
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
2	dimethenamid-p	6	EC	0.6	lb ai/a	PRE	10.01	22.3	4.31	18.7	50.58
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
3	ethofumesate	4	SC	2	lb ai/a	PRE	10.81	30.3	2.67	20.0	84.80
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
4	pyrazon	68	DF	3	lb ai/a	PRE	7.53	27.3	7.94	19.3	62.58
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
5	cycloate	6	EC	3	lb ai/a	PRE	7.15	23.0	7.12	18.3	68.25
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
6	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	8.49	27.0	5.73	17.7	43.33
	phenmediphan	1.3	L	1	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
7	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	7.97	27.3	6.95	17.7	68.23
	pyrazon	68	DF	2	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
8	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	7.00	19.3	0.99	23.3	77.47
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	clopyralid	3	EC	0.095	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
9	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE	9.20	32.0	7.36	12.7	53.97
	ethofumesate	4	SC	1	lb ai/a	PO1					
	trifluralin	50	WDG	0.156	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
10	Untreated					PRE	7.88	31.0	5.39	13.7	99.38
	ethofumesate	4	SC	1	lb ai/a	PO1					
	Betamix	1.3	EC	72	fl oz/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
LSD (P=.05)							5.226	22.90	3.871	11.23	58.329
Standard Deviation							3.047	13.35	2.210	6.54	34.002
CV							37.04	50.5	41.49	36.62	53.05

Weed Control in Cabbage and Cauliflower – HTRC 2009

Project Code: WC 114-09-01 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Cabbage, Cauliflower **Variety: Artost, Candid Charm**
Planting Method: Transplant **Planting Date: 5/13/09**
Spacing: 24 inch in row **Row Spacing: 36 inch**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.3 ft wide x 30 ft long

Soil Type: Capac Loam **OM: 1.6%** **pH: 5.5**
Sand: 76.4% **Silt: 14.9%** **Clay: 8.7%** **CEC: 7.1**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRT	5/8/09	3:00 pm	72/68	F	Damp	5-7 SW	41	90% Cloudy	N
POT	5/13/09	11:00 am	60/54	F	Damp	3 SW	58	100% Cloudy	N
PO1	6/15/09	11:00 am	77/69	F	Dry	1-3 E	56.6	5% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
6/15	BYGR = barnyardgrass	1-3″		Moderate
6/15	COLQ = common lambsquarters	4-6″		Moderate
6/15	CORW = common ragweed	1-3″		Many
6/15	LATH = ladysthumb	3-6″		Moderate
6/15	QUGR = quackgrass	12-16″		Few

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.

Weed Control in Cabbage and Cauliflower – HTRC 2009

Dept. of Horticulture, MSU

Trial ID: WC 114-09-01 Study Director: Dr. Bernard Zandstra
Location: HTRC Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Cabbage 5/Jun/2009 RATING 1-10	Cauliflower 5/Jun/2009 RATING 1-10	GRFT 5/Jun/2009 RATING 1-10	COLQ 5/Jun/2009 RATING 1-10	CORW 5/Jun/2009 RATING 1-10
1	s-metolachlor	7.62	EC	1.3	lb ai/a	PRT	2.0	2.3	10.0	10.0	10.0
	oxyfluorfen	4	SC	0.5	lb ai/a	PRT					
2	pendimethalin	3.8	CS	1	lb ai/a	PRT	1.3	1.3	10.0	10.0	1.0
3	pendimethalin	3.8	CS	2	lb ai/a	PRT	1.3	1.3	10.0	10.0	1.3
4	pendimethalin	3.8	CS	4	lb ai/a	PRT	1.7	2.3	10.0	10.0	4.7
5	pendimethalin	3.8	CS	1	lb ai/a	POT	2.3	2.0	10.0	10.0	2.3
6	pendimethalin	3.8	CS	2	lb ai/a	POT	1.3	1.3	10.0	10.0	3.0
7	pendimethalin	3.8	CS	4	lb ai/a	POT	2.0	2.0	9.7	10.0	5.7
8	napropamide	50	DF	1	lb ai/a	POT	1.0	1.3	10.0	10.0	4.7
9	napropamide-UV	50	DF	1	lb ai/a	POT	1.0	1.7	10.0	10.0	5.3
10	s-metolachlor	7.62	EC	1.3	lb ai/a	PRT	2.7	2.7	10.0	10.0	10.0
	sulfentrazone	4	F	0.188	lb ai/a	PRT					
11	s-metolachlor	7.62	EC	1.3	lb ai/a	PRT	3.3	3.3	10.0	10.0	10.0
	clomazone	3	ME	0.5	lb ai/a	PRT					
12	oxyfluorfen	4	SC	0.063	lb ai/a	PRT	3.0	3.3	10.0	10.0	10.0
	clomazone	3	ME	0.5	lb ai/a	PRT					
13	s-metolachlor	7.62	EC	1.3	lb ai/a	POT	2.3	2.3	10.0	9.7	8.3
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
14	s-metolachlor	7.62	EC	1.3	lb ai/a	POT	2.7	2.7	10.0	10.0	8.0
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	clopyralid	3	EC	0.125	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
15	Untreated					POT	1.3	1.7	1.7	3.7	1.0
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
LSD (P=.05)							1.21	1.11	0.57	1.12	2.53
Standard Deviation							0.72	0.66	0.34	0.67	1.51
CV							36.95	31.47	3.64	6.99	26.59

Weed Control in Cabbage and Cauliflower – HTRC 2009

Dept. of Horticulture, MSU

Pest Code							LATH			BYGR	CORW
Description								Cabbage	Cauliflower		
Rating Date							5/Jun/2009	15/Jun/2009	15/Jun/2009	15/Jun/2009	15/Jun/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	s-metolachlor	7.62	EC	1.3	lb ai/a	PRT	10.0	3.3	3.7	9.7	8.7
	oxyfluorfen	4	SC	0.5	lb ai/a	PRT					
2	pendimethalin	3.8	CS	1	lb ai/a	PRT	8.3	1.0	1.7	10.0	2.0
3	pendimethalin	3.8	CS	2	lb ai/a	PRT	8.7	2.0	2.0	9.7	1.7
4	pendimethalin	3.8	CS	4	lb ai/a	PRT	10.0	2.3	2.3	10.0	4.3
5	pendimethalin	3.8	CS	1	lb ai/a	POT	9.0	3.0	2.7	6.7	2.7
6	pendimethalin	3.8	CS	2	lb ai/a	POT	9.7	1.7	1.3	9.0	2.0
7	pendimethalin	3.8	CS	4	lb ai/a	POT	10.0	1.7	2.0	9.0	3.7
8	napropamide	50	DF	1	lb ai/a	POT	9.3	1.0	1.3	5.3	4.3
9	napropamide-UV	50	DF	1	lb ai/a	POT	9.7	1.3	1.7	8.7	3.0
10	s-metolachlor	7.62	EC	1.3	lb ai/a	PRT	10.0	2.7	3.3	10.0	8.3
	sulfentrazone	4	F	0.188	lb ai/a	PRT					
11	s-metolachlor	7.62	EC	1.3	lb ai/a	PRT	10.0	3.0	3.0	10.0	10.0
	clomazone	3	ME	0.5	lb ai/a	PRT					
12	oxyfluorfen	4	SC	0.063	lb ai/a	PRT	10.0	3.0	3.0	10.0	9.7
	clomazone	3	ME	0.5	lb ai/a	PRT					
13	s-metolachlor	7.62	EC	1.3	lb ai/a	POT	9.7	2.0	2.0	10.0	6.7
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
14	s-metolachlor	7.62	EC	1.3	lb ai/a	POT	10.0	3.3	3.3	10.0	6.3
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	clopyralid	3	EC	0.125	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
15	Untreated					POT	1.7	1.7	1.7	1.0	1.0
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
LSD (P=.05)							1.20	1.69	1.69	1.99	2.09
Standard Deviation							0.72	1.01	1.01	1.19	1.25
CV							7.95	45.89	43.26	13.83	25.25

Weed Control in Cabbage and Cauliflower – HTRC 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage				
Pest Code							LATH			
Description								Cabbage	Cauliflower	Cabbage	Cauliflower
Rating Date							15/Jun/2009	22/Jun/2009	22/Jun/2009	22/Jun/2009	22/Jun/2009
Rating Data Type							RATING	RATING	RATING	COUNTS	COUNTS
Rating Unit							1-10	1-10	1-10	#	#
1	s-metolachlor	7.62	EC	1.3	lb ai/a	PRT	9.7	3.0	4.0	17.7	17.3
	oxyfluorfen	4	SC	0.5	lb ai/a	PRT					
2	pendimethalin	3.8	CS	1	lb ai/a	PRT	7.3	1.7	2.3	16.7	16.3
3	pendimethalin	3.8	CS	2	lb ai/a	PRT	8.0	2.3	3.0	15.3	16.0
4	pendimethalin	3.8	CS	4	lb ai/a	PRT	10.0	3.7	3.3	16.7	16.7
5	pendimethalin	3.8	CS	1	lb ai/a	POT	6.7	3.0	2.7	16.0	15.7
6	pendimethalin	3.8	CS	2	lb ai/a	POT	9.7	2.0	2.0	15.3	17.0
7	pendimethalin	3.8	CS	4	lb ai/a	POT	10.0	1.3	1.7	17.0	17.7
8	napropamide	50	DF	1	lb ai/a	POT	6.3	1.3	1.7	17.3	17.7
9	napropamide-UV	50	DF	1	lb ai/a	POT	6.3	1.0	3.0	16.7	16.3
10	s-metolachlor	7.62	EC	1.3	lb ai/a	PRT	10.0	3.7	4.0	17.7	17.3
	sulfentrazone	4	F	0.188	lb ai/a	PRT					
11	s-metolachlor	7.62	EC	1.3	lb ai/a	PRT	10.0	5.3	6.0	17.3	16.7
	clomazone	3	ME	0.5	lb ai/a	PRT					
12	oxyfluorfen	4	SC	0.063	lb ai/a	PRT	10.0	5.0	5.3	16.7	17.0
	clomazone	3	ME	0.5	lb ai/a	PRT					
13	s-metolachlor	7.62	EC	1.3	lb ai/a	POT	9.7	4.0	4.7	16.7	17.3
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
14	s-metolachlor	7.62	EC	1.3	lb ai/a	POT	10.0	3.7	4.0	16.7	16.7
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	clopyralid	3	EC	0.125	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
15	Untreated					POT	1.0	2.7	3.3	16.7	17.3
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
LSD (P=.05)							1.79	2.07	2.11	1.57	1.61
Standard Deviation							1.07	1.24	1.26	0.94	0.96
CV							12.85	42.58	37.09	5.62	5.7

Weed Control in Cabbage and Cauliflower – HTRC 2009

Dept. of Horticulture, MSU

Pest Code							BYGR	LACG	LATH	COLQ	CORW
Description											
Rating Date							22/Jun/2009	22/Jun/2009	22/Jun/2009	22/Jun/2009	22/Jun/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	s-metolachlor	7.62	EC	1.3	lb ai/a	PRT	8.7	10.0	10.0	9.7	8.3
	oxyfluorfen	4	SC	0.5	lb ai/a	PRT					
2	pendimethalin	3.8	CS	1	lb ai/a	PRT	9.0	8.7	7.7	9.0	1.0
3	pendimethalin	3.8	CS	2	lb ai/a	PRT	9.0	9.7	9.0	10.0	1.0
4	pendimethalin	3.8	CS	4	lb ai/a	PRT	9.0	9.7	9.7	10.0	1.7
5	pendimethalin	3.8	CS	1	lb ai/a	POT	8.3	1.7	7.3	9.7	1.0
6	pendimethalin	3.8	CS	2	lb ai/a	POT	8.7	4.3	9.7	10.0	1.7
7	pendimethalin	3.8	CS	4	lb ai/a	POT	8.7	4.0	9.3	10.0	1.7
8	napropamide	50	DF	1	lb ai/a	POT	7.3	2.7	6.7	8.0	2.0
9	napropamide-UV	50	DF	1	lb ai/a	POT	6.7	4.3	4.7	9.0	2.7
10	s-metolachlor	7.62	EC	1.3	lb ai/a	PRT	9.7	10.0	10.0	10.0	8.7
	sulfentrazone	4	F	0.188	lb ai/a	PRT					
11	s-metolachlor	7.62	EC	1.3	lb ai/a	PRT	10.0	10.0	10.0	10.0	9.3
	clomazone	3	ME	0.5	lb ai/a	PRT					
12	oxyfluorfen	4	SC	0.063	lb ai/a	PRT	10.0	10.0	10.0	10.0	9.0
	clomazone	3	ME	0.5	lb ai/a	PRT					
13	s-metolachlor	7.62	EC	1.3	lb ai/a	POT	9.3	10.0	10.0	9.0	8.3
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
14	s-metolachlor	7.62	EC	1.3	lb ai/a	POT	9.7	10.0	10.0	10.0	10.0
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	clopyralid	3	EC	0.125	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
15	Untreated					POT	8.7	7.3	9.3	5.0	1.0
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
LSD (P=.05)							1.49	3.41	2.04	1.71	1.15
Standard Deviation							0.89	2.04	1.22	1.02	0.69
CV							10.04	27.25	13.75	10.99	15.27

Weed Control in Cabbage and Cauliflower – HTRC 2009

Dept. of Horticulture, MSU

Pest Code Description Rating Date Rating Data Type Rating Unit							Cabbage 24/Jul/2009 NUMBER #/PLOT	Cabbage 24/Jul/2009 WEIGHT KG	Cabbage 14/Aug/2009 NUMBER #/PLOT	Cabbage 14/Aug/2009 WEIGHT KG	Cabbage TOTAL # #
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	s-metolachlor	7.62	EC	1.3	lb ai/a	PRT	3	2.00	11	9.67	14.3
	oxyfluorfen	4	SC	0.5	lb ai/a	PRT					
2	pendimethalin	3.8	CS	1	lb ai/a	PRT	7	3.66	9	6.39	16.0
3	pendimethalin	3.8	CS	2	lb ai/a	PRT	7	7.57	9	4.89	16.0
4	pendimethalin	3.8	CS	4	lb ai/a	PRT	7	7.32	9	5.81	16.3
5	pendimethalin	3.8	CS	1	lb ai/a	POT	6	8.21	7	3.13	12.7
6	pendimethalin	3.8	CS	2	lb ai/a	POT	6	6.57	8	6.37	14.3
7	pendimethalin	3.8	CS	4	lb ai/a	POT	8	6.95	6	4.47	14.0
8	napropamide	50	DF	1	lb ai/a	POT	9	10.81	8	7.70	17.3
9	napropamide-UV	50	DF	1	lb ai/a	POT	10	9.76	6	6.08	16.7
10	s-metolachlor	7.62	EC	1.3	lb ai/a	PRT	6	9.91	9	5.57	14.7
	sulfentrazone	4	F	0.188	lb ai/a	PRT					
11	s-metolachlor	7.62	EC	1.3	lb ai/a	PRT	3	2.38	12	8.29	14.7
	clomazone	3	ME	0.5	lb ai/a	PRT					
12	oxyfluorfen	4	SC	0.063	lb ai/a	PRT	5	4.33	9	7.87	14.0
	clomazone	3	ME	0.5	lb ai/a	PRT					
13	s-metolachlor	7.62	EC	1.3	lb ai/a	POT	3	4.03	11	7.05	13.3
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
14	s-metolachlor	7.62	EC	1.3	lb ai/a	POT	3	5.53	12	8.55	15.3
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	clopyralid	3	EC	0.125	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
15	Untreated					POT	2	3.48	12	9.11	14.7
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
LSD (P=.05)							7.5	9.537	5.4	4.165	4.29
Standard Deviation							4.5	5.659	3.2	2.491	2.56
CV							78.17	91.77	34.8	37.0	17.14

Weed Control in Cabbage and Cauliflower – HTRC 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Cabbage TOTAL WT KG	Cauliflower 29/Jul/2009 NUMBER #/PLOT	Cauliflower 29/Jul/2009 WEIGHT KG	Cauliflower 18/Aug/2009 NUMBER #/PLOT	Cauliflower 18/Aug/2009 WEIGHT KG
1	s-metolachlor	7.62	EC	1.3	lb ai/a	PRT	11.67	4	1.09	6	2.22
	oxyfluorfen	4	SC	0.5	lb ai/a	PRT					
2	pendimethalin	3.8	CS	1	lb ai/a	PRT	10.05	11	2.61	2	0.69
3	pendimethalin	3.8	CS	2	lb ai/a	PRT	12.47	10	4.83	1	0.57
4	pendimethalin	3.8	CS	4	lb ai/a	PRT	13.13	11	3.52	2	0.70
5	pendimethalin	3.8	CS	1	lb ai/a	POT	11.34	8	4.74	0	0.20
6	pendimethalin	3.8	CS	2	lb ai/a	POT	12.93	13	3.48	1	0.38
7	pendimethalin	3.8	CS	4	lb ai/a	POT	11.41	9	3.57	3	0.86
8	napropamide	50	DF	1	lb ai/a	POT	18.51	13	7.50	1	0.66
9	napropamide-UV	50	DF	1	lb ai/a	POT	15.84	10	4.22	3	1.27
10	s-metolachlor	7.62	EC	1.3	lb ai/a	PRT	11.69	5	2.83	6	2.93
	sulfentrazone	4	F	0.188	lb ai/a	PRT					
11	s-metolachlor	7.62	EC	1.3	lb ai/a	PRT	10.67	7	1.71	6	3.17
	clomazone	3	ME	0.5	lb ai/a	PRT					
12	oxyfluorfen	4	SC	0.063	lb ai/a	PRT	12.20	3	1.28	7	3.79
	clomazone	3	ME	0.5	lb ai/a	PRT					
13	s-metolachlor	7.62	EC	1.3	lb ai/a	POT	9.25	10	3.83	4	1.67
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
14	s-metolachlor	7.62	EC	1.3	lb ai/a	POT	11.76	7	2.63	5	1.76
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	clopyralid	3	EC	0.125	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
15	Untreated					POT	10.95	10	2.57	2	0.51
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
LSD (P=.05)							8.082	6.7	5.460	2.7	1.911
Standard Deviation							4.833	4.0	3.265	1.6	1.143
CV							39.43	45.71	97.15	52.57	80.19

Weed Control in Cabbage and Cauliflower – HTRC 2009

Dept. of Horticulture, MSU

Pest Code Description Rating Date Rating Data Type Rating Unit							Cauliflower TOTAL # #	Cauliflower TOTAL WT KG
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage		
1	s-metolachlor	7.62	EC	1.3	lb ai/a	PRT	9.7	3.31
	oxyfluorfen	4	SC	0.5	lb ai/a	PRT		
2	pendimethalin	3.8	CS	1	lb ai/a	PRT	12.7	3.29
3	pendimethalin	3.8	CS	2	lb ai/a	PRT	11.3	5.39
4	pendimethalin	3.8	CS	4	lb ai/a	PRT	12.7	4.22
5	pendimethalin	3.8	CS	1	lb ai/a	POT	8.7	4.94
6	pendimethalin	3.8	CS	2	lb ai/a	POT	13.7	3.86
7	pendimethalin	3.8	CS	4	lb ai/a	POT	12.0	4.43
8	napropamide	50	DF	1	lb ai/a	POT	14.0	8.16
9	napropamide-UV	50	DF	1	lb ai/a	POT	12.7	5.50
10	s-metolachlor	7.62	EC	1.3	lb ai/a	PRT	11.0	5.76
	sulfentrazone	4	F	0.188	lb ai/a	PRT		
11	s-metolachlor	7.62	EC	1.3	lb ai/a	PRT	12.3	4.88
	clomazone	3	ME	0.5	lb ai/a	PRT		
12	oxyfluorfen	4	SC	0.063	lb ai/a	PRT	9.7	5.07
	clomazone	3	ME	0.5	lb ai/a	PRT		
13	s-metolachlor	7.62	EC	1.3	lb ai/a	POT	13.7	5.50
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1		
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1		
14	s-metolachlor	7.62	EC	1.3	lb ai/a	POT	12.0	4.39
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1		
	clopyralid	3	EC	0.125	lb ai/a	PO1		
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1		
15	Untreated					POT	11.7	3.09
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1		
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1		
LSD (P=.05)							6.27	5.907
Standard Deviation							3.75	3.533
CV							31.64	73.81

Preemergence Weed Control in Carrot – Muck Farm 2009

Project Code: WC 107-09-01 **Location: Laingsburg, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Carrot **Variety: Sugar Snax**
Planting Method: seeded **Planting Date: 5/19/09**
Spacing: 1 inch in row **Row Spacing: 16 inch; 3 row bed**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.3 ft wide x 16.7 ft long

Soil Type: Houghton Muck **OM: 73.5%** **pH: 6.7**
Sand: 2.2% **Silt: 23.0%** **Clay: 1.3%** **CEC:**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	5/19/09	2:30 pm	75/61	F	Damp	5-7 SW	70.0	5% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/19	CARROT		Seeded	
5/19	LACG = large crabgrass	2-4″		Few
5/19	COPU = common purslane	0-1″		Moderate
5/19	LATH = ladysthumb	1-2″		Moderate

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. Field was lost to flooding. No yields taken. Weeds were rated on 7/6/09, but carrots were dead.

Preemergence Weed Control in Carrot – Muck Farm 2009

Dept. of Horticulture, MSU

Trial ID: WC 107-09-01 Study Director: Dr. Bernard Zandstra
Location: Muck Farm, Laingsburg Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage		YENS	COLQ	LATH	TUPW
Pest Code											
Description							Carrot				
Rating Date							15/Jun/2009	15/Jun/2009	15/Jun/2009	15/Jun/2009	15/Jun/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	pendimethalin	3.8	CS	0.95	lb ai/a	PRE	1.0	1.7	9.7	2.7	5.0
2	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	2.0	2.3	10.0	5.7	7.7
3	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	2.0	2.0	10.0	8.3	9.7
4	linuron	50	DF	1	lb ai/a	PRE	1.7	1.7	7.0	2.3	6.3
5	linuron	50	DF	2	lb ai/a	PRE	2.7	1.7	8.7	5.7	7.7
6	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	1.7	7.3	3.3	4.3	10.0
7	s-metolachlor	7.62	EC	3.8	lb ai/a	PRE	2.3	7.7	5.7	5.3	10.0
8	prometryn	4	L	1	lb ai/a	PRE	1.0	2.7	6.3	3.3	4.7
9	prometryn	4	L	2	lb ai/a	PRE	2.7	3.3	8.7	7.0	6.7
10	linuron	50	DF	1	lb ai/a	PRE	2.3	6.7	8.3	6.0	9.7
	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE					
11	linuron	50	DF	1	lb ai/a	PRE	1.3	1.7	10.0	3.7	5.7
	pendimethalin	3.8	CS	0.95	lb ai/a	PRE					
12	saflufenacil	70	WG	0.045	lb ai/a	PRE	6.0	1.0	3.0	3.7	6.0
13	ethofumesate	4	SC	2	lb ai/a	PRE	1.0	5.7	3.0	6.0	3.3
14	Untreated						1.0	1.0	1.0	1.0	1.0
LSD (P=.05)							0.98	2.09	1.31	1.41	1.58
Standard Deviation							0.59	1.24	0.78	0.84	0.94
CV							28.58	37.61	11.51	18.11	14.14

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	YENS	COLQ	LATH
Pest Code									
Description									
Rating Date							6/Jul/2009	6/Jul/2009	6/Jul/2009
Rating Data Type							RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10
1	pendimethalin	3.8	CS	0.95	lb ai/a	PRE	2.3	9.7	1.3
2	pendimethalin	3.8	CS	1.9	lb ai/a	PRE	2.7	10.0	2.7
3	pendimethalin	3.8	CS	3.8	lb ai/a	PRE	2.0	10.0	7.3
4	linuron	50	DF	1	lb ai/a	PRE	1.0	5.7	1.0
5	linuron	50	DF	2	lb ai/a	PRE	3.0	9.0	2.7
6	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	10.0	1.7	1.3
7	s-metolachlor	7.62	EC	3.8	lb ai/a	PRE	10.0	5.0	2.0
8	prometryn	4	L	1	lb ai/a	PRE	2.3	5.7	2.0
9	prometryn	4	L	2	lb ai/a	PRE	2.7	9.0	4.7
10	linuron	50	DF	1	lb ai/a	PRE	9.7	9.3	1.3
	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE			
11	linuron	50	DF	1	lb ai/a	PRE	1.7	9.7	1.7
	pendimethalin	3.8	CS	0.95	lb ai/a	PRE			
12	saflufenacil	70	WG	0.045	lb ai/a	PRE	1.3	4.3	2.3
13	ethofumesate	4	SC	2	lb ai/a	PRE	6.7	5.3	6.7
14	Untreated						1.0	1.0	1.0
LSD (P=.05)							1.98	3.50	1.43
Standard Deviation							1.18	2.08	0.85
CV							29.24	30.62	31.34

Weed Control in Carrot – Fremont 2009

Project Code: WC 107-09-03 **Location: Vogel Farm**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Carrot **Variety: Sugar Snax**
Planting Method: seeded **Planting Date: 5/10/09**
Spacing: 0.3 inch in row **Row Spacing: 18 inch**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.3 ft wide x 30 ft long

Soil Type: Pipestone Sand **OM: 2.0%** **pH: 7.2**
Sand: 88.1% **Silt: 7.2%** **Clay: 4.7%** **CEC: 65.2**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	5/15/09	11:30 am	61/56	F	Damp	6 SE	63	100% Cloudy	N
PO1	6/16/09	11:30 am	81/77	F	Moist	7.5 SE	76.6	50% Cloudy	N
PO2	7/9/09	2:45 pm	80/81	F	Dry	2 SE	33	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/15	CARROT		Seeded	
6/16	CARROT	2-4″	3-4 LF	Many
6/16	COLQ = common lambsquarters	1-3″		Few
6/16	LATH = ladysthumb	2-4″		Few
6/16	RRPW = redroot pigweed	1-3″		Few
7/9	CARROT	12-14″		
7/9	COPU = common purslane	4-8″		Moderate
7/9	LATH = ladysthumb	12-14″		Few
7/9	RRPW = redroot pigweed	6-10″		Many
7/9	SPSP = spotted spurge	4-6″		Moderate

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. 3 double rows/plot spaced 18″ between double rows.

Weed Control in Carrot – Fremont 2009

Dept. of Horticulture, MSU

Trial ID: WC 107-09-03 Study Director: Dr. Bernard Zandstra
Location: Fremont Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Carrot 16/Jun/09 RATING 1-10	RRPW 16/Jun/09 RATING 1-10	LATH 16/Jun/09 RATING 1-10	COLQ 16/Jun/09 RATING 1-10	Carrot 23/Jun/09 RATING 1-10	Carrot 9/Jul/09 RATING 1-10
1	linuron	50	DF	0.25	lb ai/a	PRE	2.3	9.3	8.7	9.7	1.0	2.3
	pendimethalin	3.8	CS	0.95	lb ai/a	PRE						
	linuron	50	DF	1	lb ai/a	PO1, PO2						
2	linuron	50	DF	0.25	lb ai/a	PRE	3.0	9.7	9.3	8.7	2.0	2.7
	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE						
	linuron	50	DF	1	lb ai/a	PO1, PO2						
3	prometryn	4	L	1	lb ai/a	PRE	3.3	10.0	9.0	8.7	3.3	3.7
	linuron	50	DF	1	lb ai/a	PO1, PO2						
4	linuron	50	DF	0.5	lb ai/a	PRE	2.3	9.0	9.3	8.3	1.7	1.7
	linuron	50	DF	1	lb ai/a	PO1, PO2						
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, PO2						
5	linuron	50	DF	0.5	lb ai/a	PRE	2.7	9.7	9.3	9.0	2.0	2.3
	prometryn	4	L	1	lb ai/a	PO1, PO2						
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, PO2						
6	linuron	50	DF	0.5	lb ai/a	PRE	2.7	9.7	9.3	9.0	3.3	3.7
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, PO2						
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, PO2						
7	linuron	50	DF	0.5	lb ai/a	PRE	2.7	9.7	9.0	9.7	2.0	1.7
	ethofumesate	4	SC	1	lb ai/a	PO1, PO2						
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, PO2						
8	linuron	50	DF	0.5	lb ai/a	PRE	2.7	9.0	9.0	8.7	2.3	2.3
	carfentrazone	2	EC	0.031	lb ai/a	PODIR1, PO2						
9	pendimethalin	3.8	CS	0.95	lb ai/a	PRE	2.7	7.3	8.3	9.7	1.7	2.0
	linuron	50	DF	1	lb ai/a	PO1						
	metribuzin	75	DF	0.25	lb ai/a	PO2						
LSD (P=.05)							1.54	1.15	1.28	1.63	1.69	1.76
Standard Deviation							0.89	0.66	0.74	0.94	0.98	1.02
CV							32.81	7.16	8.21	10.41	45.46	41.04

Weed Control in Carrot – Fremont 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	LATH	SPSP	RRPW	COPU	Carrot	Carrot
Pest Code							LATH	SPSP	RRPW	COPU		
Description											Carrot	Carrot
Rating Date							9/Jul/09	9/Jul/09	9/Jul/09	9/Jul/09	13/Aug/09	8/Sep/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING	HARVEST
Rating Unit							1-10	1-10	1-10	1-10	1-10	KG
1	linuron	50	DF	0.25	lb ai/a	PRE	10.0	8.7	10.0	9.7	2.0	18.52
	pendimethalin	3.8	CS	0.95	lb ai/a	PRE						
	linuron	50	DF	1	lb ai/a	PO1, PO2						
2	linuron	50	DF	0.25	lb ai/a	PRE	10.0	10.0	10.0	9.7	2.0	17.46
	s-metolachlor	7.62	EC	0.95	lb ai/a	PRE						
	linuron	50	DF	1	lb ai/a	PO1, PO2						
3	prometryn	4	L	1	lb ai/a	PRE	10.0	9.0	10.0	9.7	2.7	17.98
	linuron	50	DF	1	lb ai/a	PO1, PO2						
4	linuron	50	DF	0.5	lb ai/a	PRE	9.7	10.0	10.0	9.7	1.3	19.82
	linuron	50	DF	1	lb ai/a	PO1, PO2						
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, PO2						
5	linuron	50	DF	0.5	lb ai/a	PRE	8.7	9.3	9.7	10.0	1.0	19.05
	prometryn	4	L	1	lb ai/a	PO1, PO2						
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, PO2						
6	linuron	50	DF	0.5	lb ai/a	PRE	8.7	8.7	10.0	10.0	1.3	17.11
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, PO2						
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, PO2						
7	linuron	50	DF	0.5	lb ai/a	PRE	9.7	10.0	9.0	10.0	1.0	20.20
	ethofumesate	4	SC	1	lb ai/a	PO1, PO2						
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, PO2						
8	linuron	50	DF	0.5	lb ai/a	PRE	8.0	9.0	9.0	8.7	7.7	8.48
	carfentrazone	2	EC	0.031	lb ai/a	PODIR1, PO2						
9	pendimethalin	3.8	CS	0.95	lb ai/a	PRE	10.0	10.0	8.7	10.0	1.0	18.53
	linuron	50	DF	1	lb ai/a	PO1						
	metribuzin	75	DF	0.25	lb ai/a	PO2						
LSD (P=.05)							2.05	2.19	1.47	1.27	0.84	4.087
Standard Deviation							1.18	1.27	0.85	0.73	0.49	2.361
CV							12.57	13.47	8.83	7.55	21.87	13.52

Weed Control in Celery – Muck Farm 2009

Project Code: WC 113-09-01 **Location: Laingsburg, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Celery **Variety: Duchess**
Planting Method: Transplant **Planting Date: 6/2/09**
Spacing: 6 inch **Row Spacing: 36 inch**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.3 ft wide x 16.7 ft long

Soil Type: Houghton Muck **OM: 76.3%** **pH: 7.0**
Sand: 3.6% **Silt: 19.1%** **Clay: 1.0%** **CEC:**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRT	6/2/09	10:00 am	56/62	F	Good	4.9 NE	57	85% Cloudy	N
POT	6/2/09	1:30 pm	70/64	F	Good	1 NE	45	100% Cloudy	N
PO1	7/6/09	11:30 am	75/62	F	Moderate	3-5 NW	66.3	45% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
7/6	CELERY	4-6″		
7/6	LACG = large crabgrass	2-6″		Many
7/6	LATH = ladysthumb	6-8″		Many
7/6	YENS = yellow nutsedge	1-8″		Many

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. Harvest: All plants from each plot; approximately 60-70 plants/plot.

Weed Control in Celery – Muck Farm 2009

Dept. of Horticulture, MSU

Trial ID: WC 113-09-01 Study Director: Dr. Bernard Zandstra
Location: Muck Farm Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Celery 6/Jul/2009 RATING 1-10	LACG 6/Jul/2009 RATING 1-10	YENS 6/Jul/2009 RATING 1-10	LATH 6/Jul/2009 RATING 1-10	Celery 13/Jul/2009 RATING 1-10	LACG 13/Jul/2009 RATING 1-10
1	flumioxazin	51	WDG	0.096	lb ai/a	PRT	1.0	1.0	1.7	4.0	1.7	8.7
	prometryn	4	L	2	lb ai/a	PO1						
2	flumioxazin	51	WDG	0.192	lb ai/a	PRT	1.0	2.7	2.7	6.0	2.0	9.3
	prometryn	4	L	2	lb ai/a	PO1						
3	flumioxazin	51	WDG	0.096	lb ai/a	POT	1.3	3.3	2.3	4.3	1.7	9.0
	prometryn	4	L	2	lb ai/a	PO1						
4	flumioxazin	51	WDG	0.192	lb ai/a	POT	1.7	7.0	2.7	7.0	1.7	9.7
	prometryn	4	L	2	lb ai/a	PO1						
5	oxyfluorfen	4	SC	0.5	lb ai/a	PRT	2.0	1.7	1.7	1.7	2.3	8.3
	prometryn	4	L	2	lb ai/a	PO1						
6	prometryn	4	L	2	lb ai/a	POT	1.0	3.0	1.3	4.3	1.3	7.3
	linuron	50	DF	1	lb ai/a	PO1						
7	prometryn	4	L	2	lb ai/a	POT	1.7	9.0	8.0	6.0	1.3	8.7
	s-metolachlor	7.62	EC	1.9	lb ai/a	POT						
	linuron	50	DF	1	lb ai/a	PO1						
8	prometryn	4	L	2	lb ai/a	POT	1.0	1.3	1.0	7.0	1.7	2.3
	flumioxazin	51	WDG	0.064	lb ai/a	PO1						
9	pendimethalin	3.8	CS	1.9	lb ai/a	POT	1.7	1.0	1.3	1.0	2.7	8.0
	prometryn	4	L	2	lb ai/a	PO1						
10	pendimethalin	3.8	CS	1.9	lb ai/a	POT	1.3	1.3	1.3	6.0	1.7	9.0
	flumioxazin	51	WDG	0.096	lb ai/a	POT						
	prometryn	4	L	2	lb ai/a	PO1						
11	sulfentrazone	4	F	0.125	lb ai/a	POT	3.3	1.0	3.7	5.7	2.3	6.7
	prometryn	4	L	1	lb ai/a	POT						
	linuron	50	DF	1	lb ai/a	PO1						
12	prometryn	4	L	2	lb ai/a	POT	1.7	1.0	1.0	7.7	2.0	1.3
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1						
13	BCS AA 10717	1.67	L	0.067	lb ai/a	POT	3.3	4.7	1.0	4.3	2.7	4.7
14	saflufenacil	70	WG	0.045	lb ai/a	POT	9.0	1.0	1.0	8.0	8.7	1.0
15	prometryn	4	L	2	lb ai/a	POT	1.7	2.0	1.0	8.0	2.3	9.3
	prometryn	4	L	2	lb ai/a	PO1						
16	Untreated					POT	1.0	1.0	1.0	2.7	2.3	7.7
	prometryn	4	L	2	lb ai/a	PO1						
LSD (P=.05)							0.86	2.21	1.34	2.85	0.99	1.51
Standard Deviation							0.52	1.32	0.81	1.71	0.59	0.90
CV							24.48	50.46	39.45	32.66	24.74	13.03

Weed Control in Celery – Muck Farm 2009

Dept. of Horticulture, MSU

Pest Code							YENS	LATH		LACG	YENS
Description									Celery		
Rating Date							13/Jul/2009	13/Jul/2009	17/Jul/2009	17/Jul/2009	17/Jul/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	flumioxazin	51	WDG	0.096	lb ai/a	PRT	6.0	7.3	3.0	8.7	2.0
	prometryn	4	L	2	lb ai/a	PO1					
2	flumioxazin	51	WDG	0.192	lb ai/a	PRT	6.0	9.3	3.3	9.3	2.3
	prometryn	4	L	2	lb ai/a	PO1					
3	flumioxazin	51	WDG	0.096	lb ai/a	POT	7.7	7.7	2.7	9.7	3.0
	prometryn	4	L	2	lb ai/a	PO1					
4	flumioxazin	51	WDG	0.192	lb ai/a	POT	6.3	9.0	1.3	10.0	2.7
	prometryn	4	L	2	lb ai/a	PO1					
5	oxyfluorfen	4	SC	0.5	lb ai/a	PRT	7.0	8.0	3.7	9.7	3.7
	prometryn	4	L	2	lb ai/a	PO1					
6	prometryn	4	L	2	lb ai/a	POT	4.0	8.7	2.3	7.3	1.3
	linuron	50	DF	1	lb ai/a	PO1					
7	prometryn	4	L	2	lb ai/a	POT	9.0	9.0	1.7	9.7	9.3
	s-metolachlor	7.62	EC	1.9	lb ai/a	POT					
	linuron	50	DF	1	lb ai/a	PO1					
8	prometryn	4	L	2	lb ai/a	POT	2.7	7.7	4.7	1.0	1.0
	flumioxazin	51	WDG	0.064	lb ai/a	PO1					
9	pendimethalin	3.8	CS	1.9	lb ai/a	POT	5.7	7.3	3.7	10.0	2.3
	prometryn	4	L	2	lb ai/a	PO1					
10	pendimethalin	3.8	CS	1.9	lb ai/a	POT	4.7	8.7	2.3	9.0	2.0
	flumioxazin	51	WDG	0.096	lb ai/a	POT					
	prometryn	4	L	2	lb ai/a	PO1					
11	sulfentrazone	4	F	0.125	lb ai/a	POT	7.0	7.7	4.7	1.0	9.3
	prometryn	4	L	1	lb ai/a	POT					
	linuron	50	DF	1	lb ai/a	PO1					
12	prometryn	4	L	2	lb ai/a	POT	2.0	8.0	3.7	1.0	1.0
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
13	BCS AA 10717	1.67	L	0.067	lb ai/a	POT	2.3	6.0	4.3	3.7	1.0
14	saflufenacil	70	WG	0.045	lb ai/a	POT	1.0	8.3	8.7	1.0	1.0
15	prometryn	4	L	2	lb ai/a	POT	4.0	9.3	3.7	10.0	1.3
	prometryn	4	L	2	lb ai/a	PO1					
16	Untreated					POT	5.0	7.7	3.7	9.0	2.3
	prometryn	4	L	2	lb ai/a	PO1					
LSD (P=.05)							2.87	1.75	1.44	1.50	1.35
Standard Deviation							1.72	1.05	0.87	0.90	0.81
CV							34.3	12.95	24.15	13.09	28.4

Weed Control in Celery – Muck Farm 2009

Dept. of Horticulture, MSU

Pest Code							LATH		LACG	YENS	LATH
Description								Celery			
Rating Date							17/Jul/2009	3/Aug/2009	3/Aug/2009	3/Aug/2009	3/Aug/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	flumioxazin	51	WDG	0.096	lb ai/a	PRT	10.0	2.7	9.0	4.0	9.0
	prometryn	4	L	2	lb ai/a	PO1					
2	flumioxazin	51	WDG	0.192	lb ai/a	PRT	10.0	2.7	8.0	3.3	9.7
	prometryn	4	L	2	lb ai/a	PO1					
3	flumioxazin	51	WDG	0.096	lb ai/a	POT	10.0	2.0	9.0	4.7	10.0
	prometryn	4	L	2	lb ai/a	PO1					
4	flumioxazin	51	WDG	0.192	lb ai/a	POT	10.0	2.0	9.3	4.0	10.0
	prometryn	4	L	2	lb ai/a	PO1					
5	oxyfluorfen	4	SC	0.5	lb ai/a	PRT	7.3	2.7	9.3	4.3	9.0
	prometryn	4	L	2	lb ai/a	PO1					
6	prometryn	4	L	2	lb ai/a	POT	6.7	3.3	4.0	2.3	9.0
	linuron	50	DF	1	lb ai/a	PO1					
7	prometryn	4	L	2	lb ai/a	POT	9.3	2.0	8.0	9.0	9.3
	s-metolachlor	7.62	EC	1.9	lb ai/a	POT					
	linuron	50	DF	1	lb ai/a	PO1					
8	prometryn	4	L	2	lb ai/a	POT	1.3	4.7	1.0	4.7	6.7
	flumioxazin	51	WDG	0.064	lb ai/a	PO1					
9	pendimethalin	3.8	CS	1.9	lb ai/a	POT	9.3	3.0	7.7	3.7	9.0
	prometryn	4	L	2	lb ai/a	PO1					
10	pendimethalin	3.8	CS	1.9	lb ai/a	POT	9.3	2.0	9.0	3.7	9.7
	flumioxazin	51	WDG	0.096	lb ai/a	POT					
	prometryn	4	L	2	lb ai/a	PO1					
11	sulfentrazone	4	F	0.125	lb ai/a	POT	10.0	2.7	2.3	5.7	9.3
	prometryn	4	L	1	lb ai/a	POT					
	linuron	50	DF	1	lb ai/a	PO1					
12	prometryn	4	L	2	lb ai/a	POT	4.7	5.0	1.0	1.0	1.0
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
13	BCS AA 10717	1.67	L	0.067	lb ai/a	POT	1.0	4.3	1.0	1.0	1.0
14	saflufenacil	70	WG	0.045	lb ai/a	POT	2.0	8.7	1.0	1.3	8.7
15	prometryn	4	L	2	lb ai/a	POT	9.7	3.7	7.3	3.0	10.0
	prometryn	4	L	2	lb ai/a	PO1					
16	Untreated					POT	6.7	3.3	8.0	4.3	9.0
	prometryn	4	L	2	lb ai/a	PO1					
LSD (P=.05)							2.74	1.40	1.72	3.23	1.37
Standard Deviation							1.65	0.84	1.03	1.94	0.82
CV							22.44	24.56	17.38	51.65	10.08

Weed Control in Celery – Muck Farm 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage				
Pest Code								LACG	YENS	
Description							Celery			Celery
Rating Date							17/Aug/2009	17/Aug/2009	17/Aug/2009	16/Sep/2009
Rating Data Type							RATING	RATING	RATING	HARVEST
Rating Unit							1-10	1-10	1-10	KG/PLOT
1	flumioxazin	51	WDG	0.096	lb ai/a	PRT	2.0	7.3	7.0	19.10
	prometryn	4	L	2	lb ai/a	PO1				
2	flumioxazin	51	WDG	0.192	lb ai/a	PRT	1.3	7.0	6.3	27.70
	prometryn	4	L	2	lb ai/a	PO1				
3	flumioxazin	51	WDG	0.096	lb ai/a	POT	1.3	8.7	7.0	25.77
	prometryn	4	L	2	lb ai/a	PO1				
4	flumioxazin	51	WDG	0.192	lb ai/a	POT	1.0	9.3	7.7	40.34
	prometryn	4	L	2	lb ai/a	PO1				
5	oxyfluorfen	4	SC	0.5	lb ai/a	PRT	2.0	8.3	7.0	30.65
	prometryn	4	L	2	lb ai/a	PO1				
6	prometryn	4	L	2	lb ai/a	POT	1.7	5.7	6.0	23.71
	linuron	50	DF	1	lb ai/a	PO1				
7	prometryn	4	L	2	lb ai/a	POT	1.3	8.3	9.0	39.75
	s-metolachlor	7.62	EC	1.9	lb ai/a	POT				
	linuron	50	DF	1	lb ai/a	PO1				
8	prometryn	4	L	2	lb ai/a	POT	2.7	1.7	6.0	15.44
	flumioxazin	51	WDG	0.064	lb ai/a	PO1				
9	pendimethalin	3.8	CS	1.9	lb ai/a	POT	1.3	7.7	6.7	22.48
	prometryn	4	L	2	lb ai/a	PO1				
10	pendimethalin	3.8	CS	1.9	lb ai/a	POT	1.7	8.7	6.3	25.46
	flumioxazin	51	WDG	0.096	lb ai/a	POT				
	prometryn	4	L	2	lb ai/a	PO1				
11	sulfentrazone	4	F	0.125	lb ai/a	POT	2.3	2.3	8.0	19.57
	prometryn	4	L	1	lb ai/a	POT				
	linuron	50	DF	1	lb ai/a	PO1				
12	prometryn	4	L	2	lb ai/a	POT	3.3	2.3	4.3	10.25
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1				
13	BCS AA 10717	1.67	L	0.067	lb ai/a	POT	3.0	5.7	4.7	15.24
14	saflufenacil	70	WG	0.045	lb ai/a	POT	7.3	1.0	6.3	1.79
15	prometryn	4	L	2	lb ai/a	POT	1.7	7.3	5.7	23.21
	prometryn	4	L	2	lb ai/a	PO1				
16	Untreated					POT	2.3	7.3	7.7	16.48
	prometryn	4	L	2	lb ai/a	PO1				
LSD (P=.05)							1.24	1.99	2.64	10.862
Standard Deviation							0.75	1.19	1.58	6.515
CV							32.86	19.37	23.97	29.2

Weed Control in Celery – Wayland, MI 2009

Project Code: WC 113-09-02 **Location: Cnossen Farms**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Celery **Variety: Duchess**
Planting Method: Transplant **Planting Date: 6/6/09**
Spacing: 6 inch **Row Spacing: 20 inch**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 3.3 ft wide x 40 ft long

Soil Type: Houghton Muck **OM: 59.9%** **pH: 6.9**
Sand: 8.9% **Silt: 29.2%** **Clay: 2.0%** **CEC:**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
POT	6/12/09	2:00 pm	74/68	F	Damp	3 NE	30	10% Cloudy	N
PO1	7/7/09	1:00 pm	71/70	F	Dry	6 NW	41	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
6/12	CELERY	4-5″	3-4 LF	
7/7	CELERY	6-8″	6-7 LF	
7/7	COPU = common purslane	1″		Many
7/7	RRPW = redroot pigweed	1-2	2-4 LF	Moderate

Notes and Comments
1. Sprays applied with 2 nozzle shielded boom FF11002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. Plots were 2 rows wide.

Weed Control in Celery – Wayland, MI 2009

Dept. of Horticulture, MSU

Trial ID: WC 113-09-02 Study Director: Dr. Bernard Zandstra
Location: Dorr, MI Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Celery 7/Jul/2009 RATING 1-10	COPU 7/Jul/2009 RATING 1-10	RRPW 7/Jul/2009 RATING 1-10	Celery 15/Jul/2009 RATING 1-10	ANBG 15/Jul/2009 RATING 1-10
1	prometryn	4	L	2	lb ai/a	POT, PO1	1.0	7.7	10.0	1.0	10.0
2	prometryn	4	L	2	lb ai/a	POT	1.7	7.7	10.0	1.3	10.0
	linuron	50	DF	1	lb ai/a	PO1					
3	flumioxazin	51	WDG	0.096	lb ai/a	POT	2.0	7.3	9.7	1.7	9.7
	prometryn	4	L	2	lb ai/a	PO1					
4	flumioxazin	51	WDG	0.196	lb ai/a	POT	3.0	8.3	8.7	1.7	10.0
	prometryn	4	L	2	lb ai/a	PO1					
5	flumioxazin	51	WDG	0.096	lb ai/a	POT	1.3	9.0	10.0	1.0	8.0
	pendimethalin	3.8	CS	1.9	lb ai/a	POT					
	prometryn	4	L	2	lb ai/a	PO1					
6	prometryn	4	L	2	lb ai/a	POT	1.7	8.0	10.0	1.3	8.3
	s-metolachlor	7.62	EC	1.9	lb ai/a	POT					
7	oxyfluorfen	4	SC	0.5	lb ai/a	POT	2.7	7.3	10.0	1.7	9.3
	prometryn	4	L	2	lb ai/a	PO1					
8	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	1.0	7.0	9.3	2.0	5.3
	flumioxazin	51	WDG	0.032	lb ai/a	PO1					
9	sulfentrazone	4	F	0.125	lb ai/a	POT	1.3	8.3	10.0	1.3	8.0
	prometryn	4	L	2	lb ai/a	PO1					
10	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	1.3	8.0	10.0	1.3	8.7
	prometryn	4	L	1	lb ai/a	PO1					
	linuron	50	DF	1	lb ai/a	PO1					
11	prometryn	4	L	2	lb ai/a	POT	1.3	6.7	10.0	2.7	7.3
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
12	Untreated					POT	1.3	1.0	1.0	2.0	7.0
	prometryn	4	L	2	lb ai/a	PO1					
LSD (P=.05)							1.01	1.16	1.00	1.07	2.95
Standard Deviation							0.59	0.68	0.59	0.63	1.74
CV							36.28	9.5	6.5	40.02	20.54

Weed Control in Celery – Wayland, MI 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage		
Pest Code							COPU	
Description								Celery
Rating Date							15/Jul/2009	1/Sep/2009
Rating Data Type							RATING	HARVEST
Rating Unit							1-10	KG
1	prometryn	4	L	2	lb ai/a	POT, PO1	6.7	38.04
2	prometryn	4	L	2	lb ai/a	POT	5.7	30.61
	linuron	50	DF	1	lb ai/a	PO1		
3	flumioxazin	51	WDG	0.096	lb ai/a	POT	7.7	36.21
	prometryn	4	L	2	lb ai/a	PO1		
4	flumioxazin	51	WDG	0.196	lb ai/a	POT	8.3	33.92
	prometryn	4	L	2	lb ai/a	PO1		
5	flumioxazin	51	WDG	0.096	lb ai/a	POT	9.0	37.04
	pendimethalin	3.8	CS	1.9	lb ai/a	POT		
	prometryn	4	L	2	lb ai/a	PO1		
6	prometryn	4	L	2	lb ai/a	POT	6.7	37.47
	s-metolachlor	7.62	EC	1.9	lb ai/a	POT		
7	oxyfluorfen	4	SC	0.5	lb ai/a	POT	7.0	34.07
	prometryn	4	L	2	lb ai/a	PO1		
8	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	6.7	34.89
	flumioxazin	51	WDG	0.032	lb ai/a	PO1		
9	sulfentrazone	4	F	0.125	lb ai/a	POT	8.7	37.60
	prometryn	4	L	2	lb ai/a	PO1		
10	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	8.0	31.98
	prometryn	4	L	1	lb ai/a	PO1		
	linuron	50	DF	1	lb ai/a	PO1		
11	prometryn	4	L	2	lb ai/a	POT	9.7	34.05
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1		
12	Untreated					POT	2.3	29.89
	prometryn	4	L	2	lb ai/a	PO1		
LSD (P=.05)							1.63	4.584
Standard Deviation							0.96	2.707
CV							13.34	7.81

Weed Control in Sweet Corn – HTRC 2009

Project Code: WC 106-09-01 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco
Crop: Sweet Corn **Variety: BC0805 and GSS0966**
Planting Method: Seed **Planting Date: 6/3/09**
Spacing: 8 inch **Row Spacing: 30 inch; 1 Row of each hybrid/plot**
Tillage Type: Conventional **Study Design: RCB Replications: 3**
Plot Size: 5.3 ft wide x 30 ft long

Soil Type: Marlette Fine Sandy Loam **OM: 1.5%** **pH: 5.6**
Sand: 51.5% **Silt: 32.1%** **Clay: 16.4%** **CEC: 6.9**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	6/5/09	10:00 am	75/62	F	Mod/Dry	1-3 MPH	31	0% Cloudy	N
PO1	6/26/09	9:00 am	82/79	F	Good	1-3 MPH	45	0% Cloudy	N

Crop and Weed Information at Application

Date	Crop or Weed	Height or Diameter	Growth Stage	Density
6/5	SWCO = sweet corn		Planted	
6/26	SWCO = sweet corn	4-8″		
6/26	BYGR = barnyardgrass			
6/26	GRFT = green foxtail	1-4″		Many
6/26	COLQ = common lambsquarters	1-3″		Many
6/26	LATH = ladysthumb			
6/26	RRPW = redroot pigweed	1-2″		Few
6/26	WIBW = wild buckwheat			

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. Hybrids: BC 0805 on the south row, and GSS 0966 on the north row. 1 row of each hybrid per plot.

Weed Control in Sweet Corn – HTRC 2009

Dept. of Horticulture, MSU

Trial ID: WC 106-09-01 Study Director: Dr. Bernard Zandstra
Location: HTRC Investigator: Rodney Tocco

Pest Code								GRFT	COLQ		
Description							Sweet Corn			BCC 0805	GSS 0966
Rating Date							26/Jun/2009	26/Jun/2009	26/Jun/2009	6/Jul/2009	6/Jul/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	5.3	10.0	8.3	1.7	1.0
2	s-metolachlor	7.64	EC	1.9	lb ai/a	PRE	4.0	10.0	8.7	1.0	1.0
3	dimethenamid-p	6	EC	0.98	lb ai/a	PRE	5.3	10.0	9.0	1.7	1.7
4	acetochlor	6.4	EC	2	lb ai/a	PRE	5.0	10.0	10.0	1.3	1.3
5	mesotrione	4	SC	0.188	lb ai/a	PRE	2.7	8.0	10.0	1.0	1.0
6	saflufenacil	70	WG	0.135	lb ai/a	PRE	5.0	7.3	10.0	1.7	1.3
7	pendimethalin	3.8	CS	1.5	lb ai/a	PRE	7.3	5.7	6.0	2.3	2.0
8	atrazine	4	F	2	lb ai/a	PRE	4.0	2.0	8.7	1.0	1.0
9	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	4.7	9.7	8.0	1.7	1.0
	mesotrione	4	SC	0.094	lb ai/a	PO1					
	COC	100	SL	0.5	% v/v	PO1					
10	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	4.0	10.0	8.0	1.3	1.3
	tembotrione	3.5	SC	0.123	lb ai/a	PO1					
	COC	100	SL	0.5	% v/v	PO1					
11	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	4.0	10.0	9.0	1.7	1.7
	halosulfuron	75	WG	0.047	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
12	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	4.3	9.7	9.0	1.7	1.7
	fluroxypyr	2.8	L	0.125	lb ai/a	PO1					
13	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	5.3	10.0	9.3	1.3	1.0
	foramsulfuron	35	WDG	0.038	lb ai/a	PO1					
14	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	5.0	10.0	9.7	2.3	1.7
	carfentrazone	2	EC	0.016	lb ai/a	PO1					
	clopyralid	3	EC	0.125	lb ai/a	PO1					
15	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	5.0	10.0	9.3	1.7	1.7
	fluthiacet	0.91	EC	0.006	lb ai/a	PO1					
16	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	4.3	10.0	9.0	2.7	1.7
	glufosinate	1.67	L	0.26	lb ai/a	PO1					
LSD (P=.05)							1.80	1.97	1.87	1.40	1.19
Standard Deviation							1.08	1.18	1.12	0.84	0.72
CV							22.95	13.28	12.62	51.54	52.06

Weed Control in Sweet Corn – HTRC 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	BYGR	GRFT	COLQ	LATH	RRPW	WIBW
Pest Code							BYGR	GRFT	COLQ	LATH	RRPW	WIBW
Description												
Rating Date							6/Jul/2009	6/Jul/2009	6/Jul/2009	6/Jul/2009	6/Jul/2009	6/Jul/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10
1	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	10.0	10.0	7.3	7.0	9.7	4.3
2	s-metolachlor	7.64	EC	1.9	lb ai/a	PRE	10.0	10.0	7.7	7.7	10.0	6.3
3	dimethenamid-p	6	EC	0.98	lb ai/a	PRE	10.0	10.0	8.7	9.0	10.0	6.7
4	acetochlor	6.4	EC	2	lb ai/a	PRE	10.0	10.0	9.7	10.0	10.0	9.0
5	mesotrione	4	SC	0.188	lb ai/a	PRE	5.3	7.3	10.0	10.0	10.0	9.7
6	saflufenacil	70	WG	0.135	lb ai/a	PRE	7.0	8.0	10.0	10.0	10.0	10.0
7	pendimethalin	3.8	CS	1.5	lb ai/a	PRE	5.3	6.7	9.3	8.3	8.0	7.3
8	atrazine	4	F	2	lb ai/a	PRE	1.7	2.0	9.0	9.7	9.3	8.3
9	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	10.0	10.0	10.0	10.0	10.0	10.0
	mesotrione	4	SC	0.094	lb ai/a	PO1						
	COC	100	SL	0.5	% v/v	PO1						
10	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	10.0	10.0	9.3	10.0	10.0	10.0
	tembotrione	3.5	SC	0.123	lb ai/a	PO1						
	COC	100	SL	0.5	% v/v	PO1						
11	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	10.0	10.0	9.3	10.0	10.0	10.0
	halosulfuron	75	WG	0.047	lb ai/a	PO1						
	NIS	100	SL	0.25	% v/v	PO1						
12	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	10.0	10.0	8.0	7.7	10.0	8.7
	fluroxypyr	2.8	L	0.125	lb ai/a	PO1						
13	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	10.0	10.0	8.0	9.0	10.0	9.3
	foramsulfuron	35	WDG	0.038	lb ai/a	PO1						
14	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	10.0	10.0	10.0	10.0	10.0	9.3
	carfentrazone	2	EC	0.016	lb ai/a	PO1						
	clopyralid	3	EC	0.125	lb ai/a	PO1						
15	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	10.0	10.0	9.7	8.7	10.0	8.3
	fluthiacet	0.91	EC	0.006	lb ai/a	PO1						
16	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	10.0	10.0	10.0	10.0	10.0	10.0
	glufosinate	1.67	L	0.26	lb ai/a	PO1						
LSD (P=.05)							1.42	0.82	1.41	1.59	0.69	2.96
Standard Deviation							0.85	0.49	0.85	0.95	0.42	1.77
CV							9.8	5.45	9.27	10.37	4.25	20.68

Weed Control in Sweet Corn – HTRC 2009

Dept. of Horticulture, MSU

Pest Code										
Description							GSS 0966	GSS 0966	BCC 0805	BCC 0805
Rating Date							2/Sep/2009	2/Sep/2009	9/Sep/2009	9/Sep/2009
Rating Data Type							HARVEST	WEIGHT	HARVEST	WEIGHT
Rating Unit							#	KG	#	KG
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage				
1	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	29	9.10	28	9.99
2	s-metolachlor	7.64	EC	1.9	lb ai/a	PRE	36	11.13	34	11.65
3	dimethenamid-p	6	EC	0.98	lb ai/a	PRE	35	12.23	32	10.61
4	acetochlor	6.4	EC	2	lb ai/a	PRE	34	9.72	35	11.96
5	mesotrione	4	SC	0.188	lb ai/a	PRE	37	12.41	40	14.13
6	saflufenacil	70	WG	0.135	lb ai/a	PRE	36	11.88	36	13.09
7	pendimethalin	3.8	CS	1.5	lb ai/a	PRE	23	6.82	24	8.07
8	atrazine	4	F	2	lb ai/a	PRE	24	7.71	35	11.05
9	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	39	12.30	32	10.40
	mesotrione	4	SC	0.094	lb ai/a	PO1				
	COC	100	SL	0.5	% v/v	PO1				
10	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	31	7.44	40	14.65
	tembotrione	3.5	SC	0.123	lb ai/a	PO1				
	COC	100	SL	0.5	% v/v	PO1				
11	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	37	12.16	36	12.71
	halosulfuron	75	WG	0.047	lb ai/a	PO1				
	NIS	100	SL	0.25	% v/v	PO1				
12	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	42	12.69	31	11.00
	fluroxypyr	2.8	L	0.125	lb ai/a	PO1				
13	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	42	12.67	25	8.99
	foramsulfuron	35	WDG	0.038	lb ai/a	PO1				
14	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	40	13.01	38	13.78
	carfentrazone	2	EC	0.016	lb ai/a	PO1				
	clopyralid	3	EC	0.125	lb ai/a	PO1				
15	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	38	12.22	35	11.91
	fluthiacet	0.91	EC	0.006	lb ai/a	PO1				
16	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	41	12.97	39	13.40
	glufosinate	1.67	L	0.26	lb ai/a	PO1				
LSD (P=.05)							11.8	4.476	14.8	5.369
Standard Deviation							7.1	2.685	8.9	3.220
CV							20.11	24.34	26.4	27.5

Devrinol in Basil – Sandhill 2009

Project Code: WC 117-09-01 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Basil **Variety: Superior**
Planting Method: Seeded **Planting Date: 6/12/09**
Spacing: 3 inch **Row Spacing: 14 inch; 3 rows/plot**
Tillage Type: Conventional **Study Design: RCB** **Replications: 4**
Plot Size: 5.3 ft wide x 30 ft long

Soil Type: Riddles Sandy Loam **OM: 1.9%** **pH: 7.3**
Sand: 82% **Silt: 11%** **Clay: 7%** **CEC: 7.6**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	6/15/09	10:20 am	78/67	F	Dry	NONE	58.6	20% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
6/15	BASIL		Seeded	
7/7	LACG = large crabgrass			
7/7	COLQ = common lambsquarters			
7/7	COPU = common purslane			
7/7	CORW = common ragweed			

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.

Devrinol in Basil – Sandhill 2009

Dept. of Horticulture, MSU

Trial ID: PO3439.09-MIPO2 Study Director: Sylvia Morse
Location: East Lansing, MI Investigator: Dr. Bernard Zandstra

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage						
Pest Code								LACG	COLQ	COPU	CORW	
Crop Code							BASIL					BASIL
Rating Date							7/Jul/2009	7/Jul/2009	7/Jul/2009	7/Jul/2009	7/Jul/2009	15/Jul/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10
1	Untreated						1.0	1.0	0.8	1.0	1.0	1.3
2	napropamide	50	DF	1	lb ai/a	PRE	1.3	10.0	9.3	10.0	8.8	1.8
3	napropamide	50	DF	2	lb ai/a	PRE	2.8	10.0	9.8	10.0	9.3	4.5
LSD (P=.05)							1.19	0.00	0.64	0.00	0.74	1.55
Standard Deviation							0.69	0.00	0.35	0.00	0.41	0.90
CV							41.23	0.0	5.29	0.0	6.45	35.9

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage						
Pest Code							LACG	COLQ	COPU	CORW		LACG
Crop Code											BASIL	
Rating Date							15/Jul/2009	15/Jul/2009	15/Jul/2009	15/Jul/2009	30/Jul/2009	30/Jul/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10
1	Untreated						1.0	1.0	1.0	1.0	1.3	1.3
2	napropamide	50	DF	1	lb ai/a	PRE	10.0	8.5	10.0	7.3	1.5	10.0
3	napropamide	50	DF	2	lb ai/a	PRE	10.0	9.3	10.0	7.8	4.0	10.0
LSD (P=.05)							0.00	0.64	0.00	0.64	1.55	0.50
Standard Deviation							0.00	0.37	0.00	0.37	0.90	0.29
CV							0.0	5.96	0.0	6.99	39.89	4.08

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code							COLQ	COPU	CORW		
Crop Code										BASIL	BASIL
Rating Date							30/Jul/2009	30/Jul/2009	30/Jul/2009	18/Aug/2009	18/Aug/09
Rating Data Type							RATING	RATING	RATING	HARVEST	RATING
Rating Unit							1-10	1-10	1-10	KG/PLOT	1-10
1	Untreated						1.8	1.0	1.3	6.10	1.5
2	napropamide	50	DF	1	lb ai/a	PRE	8.0	8.8	8.5	8.99	1.5
3	napropamide	50	DF	2	lb ai/a	PRE	8.5	9.3	8.3	5.86	3.0
LSD (P=.05)							1.66	1.75	2.29	1.947	0.82
Standard Deviation							0.96	1.01	1.32	1.125	0.47
CV							15.74	16.01	22.05	16.11	23.57

Weed Control in Basil – Momence, IL 2008

Project Code: WC 117-09-02 **Location: Van Drunen Farms**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Basil **Variety: See notes.**
Planting Method: seeded **Planting Date: 6/1/09**
Spacing: 2 inch **Row Spacing: 10 inch**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.3 ft wide x 30 ft long

Soil Type: Loamy Sand **OM: 2.2%** **pH: 5.7**
Sand: 78.9% **Silt: 13.7%** **Clay: 7.4%** **CEC: 6.2**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	6/4/09	11:00 am	68/63	F	Moderate	1-3 N	50	7.5% Cloudy	N
PO1	6/30/09	9:30 am	67/76	F	Moderate	1-3 NW	74	100% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage Planted	Density
6/4	BASIL			
6/30	BASIL	2-3″		Good Stand
6/30	BYGR = barnyardgrass			
6/30	CAWE = carpetweed	0-1″		Many
6/30	COPU = common purslane	1-2″		Moderate
6/30	CUDO = curly dock	4-8″		Moderate
6/30	LACG = large crabgrass	6-12″		Many
6/30	RRPW = redroot pigweed	2-6″		Moderate
6/30	STGR = stinkgrass			

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. Plots had four rows, one for each variety: Stella, Genovese, Millito, San Remo.

Weed Control in Basil – Momence, IL 2008

Dept. of Horticulture, MSU

Trial ID: WC 117-09-02 Study Director: Dr. Bernard Zandstra
Location: Van Drunen Farms Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Basil	LACG	CAWE	COPU	CUDO
Pst Code											
Description							Basil				
Rating Date							30/Jun/2009	30/Jun/2009	30/Jun/2009	30/Jun/2009	30/Jun/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	napropamide	50	DF	2	lb ai/a	PRE	1.7	6.0	5.7	1.0	7.0
2	napropamide-UV	50	DF	2	lb ai/a	PRE	1.7	9.3	6.3	2.3	5.0
3	terbacil	80	WP	0.3	lb ai/a	PRE	10.0	8.7	9.0	9.0	9.7
4	sulfentrazone	4	F	0.094	lb ai/a	PRE	5.3	1.3	9.7	8.7	9.3
5	linuron	50	DF	0.25	lb ai/a	PRE	2.7	1.0	1.0	1.0	8.3
	linuron	50	DF	0.5	lb ai/a	PO1					
6	linuron	50	DF	0.5	lb ai/a	PRE	6.0	1.7	1.0	1.7	7.3
7	clomazone	3	ME	0.25	lb ai/a	PRE	7.3	8.3	1.0	10.0	9.3
8	clomazone	3	ME	0.5	lb ai/a	PRE	10.0	9.0	1.0	10.0	10.0
9	napropamide	50	DF	2	lb ai/a	PRE	2.3	7.7	2.7	1.3	8.7
	bentazon	4	L	0.5	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	COC	100	SL	1	% v/v	PO1					
10	Untreated					PRE	2.7	1.0	1.0	1.0	1.0
	terbacil	80	WP	0.5	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	COC	100	SL	1	% v/v	PO1					
LSD (P=.05)							1.82	1.59	3.06	1.58	2.01
Standard Deviation							1.06	0.92	1.79	0.92	1.17
CV							21.33	17.13	46.58	20.02	15.49

Weed Control in Basil – Momence, IL 2008

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	RRPW	Stella	Genovese	Millito	San Remo
Pest Code											
Description											
Rating Date							30/Jun/2009	16/Jul/2009	16/Jul/2009	16/Jul/2009	16/Jul/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	napropamide	50	DF	2	lb ai/a	PRE	8.3	1.0	1.3	1.3	1.0
2	napropamide-UV	50	DF	2	lb ai/a	PRE	6.7	1.3	2.0	2.0	1.3
3	terbacil	80	WP	0.3	lb ai/a	PRE	9.7	10.0	10.0	9.0	10.0
4	sulfentrazone	4	F	0.094	lb ai/a	PRE	9.7	8.0	3.3	3.7	2.3
5	linuron	50	DF	0.25	lb ai/a	PRE	8.3	6.7	6.7	7.0	5.7
	linuron	50	DF	0.5	lb ai/a	PO1					
6	linuron	50	DF	0.5	lb ai/a	PRE	9.7	3.7	2.7	2.7	2.7
7	clomazone	3	ME	0.25	lb ai/a	PRE	9.7	3.7	2.3	2.3	2.7
8	clomazone	3	ME	0.5	lb ai/a	PRE	9.7	6.3	5.7	6.0	4.0
9	napropamide	50	DF	2	lb ai/a	PRE	8.7	2.0	2.0	1.7	1.7
	bentazon	4	L	0.5	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	COC	100	SL	1	% v/v	PO1					
10	Untreated					PRE	1.0	6.7	7.3	7.3	7.0
	terbacil	80	WP	0.5	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	COC	100	SL	1	% v/v	PO1					
LSD (P=.05)							3.07	2.80	2.22	2.18	1.84
Standard Deviation							1.79	1.63	1.30	1.27	1.07
CV							21.98	33.08	29.89	29.62	28.0

Weed Control in Basil – Momence, IL 2008

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	BYGR	LACG	STGR	CAWE	COPU
Pest Code							BYGR	LACG	STGR	CAWE	COPU
Description											
Rating Date							16/Jul/2009	16/Jul/2009	16/Jul/2009	16/Jul/2009	16/Jul/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	napropamide	50	DF	2	lb ai/a	PRE	8.0	5.0	6.3	7.3	6.0
2	napropamide-UV	50	DF	2	lb ai/a	PRE	8.0	6.3	8.3	8.0	7.3
3	terbacil	80	WP	0.3	lb ai/a	PRE	9.0	7.7	4.0	8.3	7.7
4	sulfentrazone	4	F	0.094	lb ai/a	PRE	6.0	1.7	5.7	8.3	7.0
5	linuron	50	DF	0.25	lb ai/a	PRE	3.0	1.0	1.0	10.0	9.7
	linuron	50	DF	0.5	lb ai/a	PO1					
6	linuron	50	DF	0.5	lb ai/a	PRE	4.0	1.3	1.3	8.0	7.3
7	clomazone	3	ME	0.25	lb ai/a	PRE	9.3	2.0	9.0	1.7	8.7
8	clomazone	3	ME	0.5	lb ai/a	PRE	9.7	4.0	10.0	1.0	10.0
9	napropamide	50	DF	2	lb ai/a	PRE	9.7	8.0	7.0	4.3	10.0
	bentazon	4	L	0.5	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	COC	100	SL	1	% v/v	PO1					
10	Untreated					PRE	9.7	9.7	8.3	10.0	10.0
	terbacil	80	WP	0.5	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	COC	100	SL	1	% v/v	PO1					
LSD (P=.05)							3.34	3.03	3.89	1.93	2.10
Standard Deviation							1.95	1.76	2.27	1.12	1.23
CV							25.5	37.82	37.21	16.77	14.66

Weed Control in Basil – Momence, IL 2008

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage		
Pest Code							RRPW	
Description								Basil
Rating Date							16/Jul/2009	18/Aug/2009
Rating Data Type							RATING	HARVEST
Rating Unit							1-10	KG/PLOT
1	napropamide	50	DF	2	lb ai/a	PRE	6.7	25.33
2	napropamide-UV	50	DF	2	lb ai/a	PRE	6.7	20.67
3	terbacil	80	WP	0.3	lb ai/a	PRE	6.3	2.81
4	sulfentrazone	4	F	0.094	lb ai/a	PRE	9.3	14.29
5	linuron	50	DF	0.25	lb ai/a	PRE	9.7	2.66
	linuron	50	DF	0.5	lb ai/a	PO1		
6	linuron	50	DF	0.5	lb ai/a	PRE	8.0	12.56
7	clomazone	3	ME	0.25	lb ai/a	PRE	8.7	19.72
8	clomazone	3	ME	0.5	lb ai/a	PRE	9.7	17.16
9	napropamide	50	DF	2	lb ai/a	PRE	7.0	36.41
	bentazon	4	L	0.5	lb ai/a	PO1		
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1		
	COC	100	SL	1	% v/v	PO1		
10	Untreated					PRE	7.0	6.00
	terbacil	80	WP	0.5	lb ai/a	PO1		
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1		
	COC	100	SL	1	% v/v	PO1		
LSD (P=.05)							3.50	14.392
Standard Deviation							2.04	8.390
CV							25.85	53.24

Weed Control in Cilantro, Dill, Fennel, and Parsley – Momence, IL 2009

Project Code: WC 117-09-03 **Location: Van Drunen Farms**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Cilantro, Dill, Fennel, Parsley **Variety: See notes**
Planting Method: seeded **Planting Date: 6/3/09**
Spacing: 3 inch **Row Spacing: 10 inch**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.3 ft wide x 30 ft long

Soil Type: Loamy Sand **OM: 2.0%** **pH: 5.7**
Sand: 82.7% **Silt: 9.4%** **Clay: 7.9%** **CEC: 7.8**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	6/4/09	12:00 pm	72/67	F	Moderate	2-3 N	43	5% Cloudy	N
PO1	6/30/09	9:45 am	67/76	F	Moderate	2 NW	74	100% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
6/4	Cilantro, Dill, Fennel, Parsley		Planted	
6/30	Cilantro, Dill, Fennel, Parsley	1-3″		
6/30	CAWE = carpetweed	0-1″		Few
6/30	COPU = common purslane	1-3″		Few
6/30	CUDO = curly dock	4-8″		Moderate
6/30	LACG = large crabgrass	2-8″		Many
6/30	RRPW = redroot pigweed	2-6″		Moderate

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. 1 row crop/plot, Cilantro – Long Standing, Dill – Hidi, Fennel - Zefafino, Parsley – Italian Giant.
4. Parsley was not harvested because of a poor stand.

Weed Control in Cilantro, Dill, Fennel, and Parsley – Momence, IL 2009

Dept. of Horticulture, MSU

Trial ID: WC 117-09-03 Study Director: Dr. Bernard Zandstra
Location: Van Drunen Farms Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Fennel 30/Jun/09 RATING 1-10	Dill 30/Jun/09 RATING 1-10	Parsley 30/Jun/09 RATING 1-10	Cilantro 30/Jun/09 RATING 1-10	LACG 30/Jun/09 RATING 1-10	RRPW 30/Jun/09 RATING 1-10
1	pendimethalin	3.8	CS	1.3	lb ai/a	PRE	4.3	3.0	9.3	2.3	9.7	10.0
	s-metolachlor	7.62	EC	0.63	lb ai/a	PRE						
2	s-metolachlor	7.62	EC	0.63	lb ai/a	PRE	5.7	5.3	10.0	3.0	10.0	9.0
3	dimethenamid-p	6	EC	0.56	lb ai/a	PRE	10.0	9.7	10.0	6.3	9.3	9.7
4	propachlor	4	F	2	lb ai/a	PRE	5.7	3.0	6.7	2.7	7.3	9.0
	ethofumesate	4	SC	1	lb ai/a	PO1						
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1						
	NIS	100	SL	0.25	% v/v	PO1						
5	ethofumesate	4	SC	1	lb ai/a	PRE	6.7	2.3	10.0	2.7	7.0	6.7
	linuron	50	DF	0.5	lb ai/a	PO1						
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1						
	NIS	100	SL	0.25	% v/v	PO1						
6	DCPA	75	WP	6	lb ai/a	PRE	3.3	1.3	5.7	1.7	9.7	8.0
7	DCPA	75	WP	6	lb ai/a	PRE	4.3	2.0	9.3	1.7	8.3	8.7
	linuron	50	DF	0.5	lb ai/a	PO1						
8	Untreated Check					PRE	1.0	1.0	1.0	1.0	1.0	1.0
	ethofumesate	4	SC	1	lb ai/a	PO1						
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1						
	NIS	100	SL	0.25	% v/v	PO1						
LSD (P=.05)							2.85	2.00	2.54	1.14	1.05	3.04
Standard Deviation							1.63	1.14	1.45	0.65	0.60	1.74
CV							31.72	33.09	18.7	24.38	7.67	22.42

Weed Control in Cilantro, Dill, Fennel, and Parsley – Momence, IL 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CAWE	COPU	CUDO	Cilantro	Dill	Fennel
	Pest Code						CAWE	COPU	CUDO			
	Description									Cilantro	Dill	Fennel
	Rating Date						30/Jun/09	30/Jun/09	30/Jun/09	18/Aug/09	18/Aug/09	18/Aug/09
	Rating Data Type						RATING	RATING	RATING	HARVEST	HARVEST	HARVEST
	Rating Unit						1-10	1-10	1-10	KG	KG	KG
1	pendimethalin	3.8	CS	1.3	lb ai/a	PRE	10.0	10.0	8.7	2.11	2.60	1.67
	s-metolachlor	7.62	EC	0.63	lb ai/a	PRE						
2	s-metolachlor	7.62	EC	0.63	lb ai/a	PRE	8.0	8.3	7.7	1.63	1.21	0.73
3	dimethenamid-p	6	EC	0.56	lb ai/a	PRE	8.7	8.3	7.7	1.00	0.15	0.05
4	propachlor	4	F	2	lb ai/a	PRE	5.7	5.0	5.0	1.27	1.74	0.95
	ethofumesate	4	SC	1	lb ai/a	PO1						
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1						
	NIS	100	SL	0.25	% v/v	PO1						
5	ethofumesate	4	SC	1	lb ai/a	PRE	3.7	7.0	5.0	2.25	2.10	0.72
	linuron	50	DF	0.5	lb ai/a	PO1						
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1						
	NIS	100	SL	0.25	% v/v	PO1						
6	DCPA	75	WP	6	lb ai/a	PRE	9.7	9.0	5.0	2.49	2.72	1.95
7	DCPA	75	WP	6	lb ai/a	PRE	9.3	8.3	5.3	3.56	3.55	2.51
	linuron	50	DF	0.5	lb ai/a	PO1						
8	Untreated Check					PRE	1.0	1.0	1.0	1.07	1.19	1.02
	ethofumesate	4	SC	1	lb ai/a	PO1						
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1						
	NIS	100	SL	0.25	% v/v	PO1						
LSD (P=.05)							1.29	1.81	3.88	1.875	1.569	2.181
Standard Deviation							0.74	1.04	2.21	1.071	0.896	1.245
CV							10.51	14.53	39.06	55.68	46.97	103.85

Weed Control in Lettuce – Muck Farm 2009

Project Code: WC 116-09-02 **Location: Laingsburg, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Romaine Lettuce **Variety: See Notes**
Planting Method: Seeded **Planting Date: 6/12/09**
Spacing: 12 inch in row **Row Spacing: 24 inch on 36 inch bed**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 3.33 ft wide x 30 ft long

Soil Type: Houghton Muck **OM: 77.3%** **pH: 7.0**
Sand: 0.7% **Silt: 20.9%** **Clay: 1.2%** **CEC:**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PO1	7/7/09	10:30 am	69/61	F	Dry	3-7 W	15	15% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
7/7	LETTUCE (Black Seeded Simpson)	2-3″	4 leaf	
7/7	LETTUCE (Great Lakes)	2-3″	4 leaf	
7/7	LETTUCE (Paris Island)	3-4″	6 leaf	
7/7	COPU = common purslane	1-3″		Many
7/7	LACG = large crabgrass	2-3″		Few
7/7	LATH = ladysthumb	4-6″		Moderate
7/7	RRPW = redroot pigweed	3-5″		Moderate
7/7	YENS = yellow nutsedge	4-6″		Moderate

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. Cultivars: Black Seeded Simpson (leaf), Great Lakes 659 (head), Paris Island Cos (Romaine)
4. The field suffered flood damage after seeding. Head lettuce stand was reduced and therefore not harvested.

Weed Control in Lettuce – Muck Farm 2009

Dept. of Horticulture, MSU

Trial ID: WC 116-09-02 Study Director: Dr. Bernard Zandstra
Location: Lainsburg, MI Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	LEAF 17/Jul/2009 RATING 1-10	HEAD 17/Jul/2009 RATING 1-10	ROMAINE 17/Jul/2009 RATING 1-10	LACG 17/Jul/2009 RATING 1-10	YENS 17/Jul/2009 RATING 1-10
1	pronamide	50	WP	6	lb ai/a	PO1	2.3	3.7	2.3	7.0	6.0
	imazamox	1	AS	0.063	lb ai/a	PO1					
2	sulfentrazone	4	F	0.125	lb ai/a	PO1	5.3	7.3	2.7	5.0	7.7
3	imazosulfuron	75	WDG	0.2	lb ai/a	PO1	3.0	8.3	2.7	3.7	7.3
4	ethofumesate	4	SC	1	lb ai/a	PO1	1.3	3.7	1.0	6.3	5.0
5	imazamox	1	AS	0.031	lb ai/a	PO1	4.0	8.0	5.7	6.7	4.3
6	imazamox	1	AS	0.063	lb ai/a	PO1	2.3	3.7	1.7	8.3	6.7
7	imazethapyr	2	EC	0.063	lb ai/a	PO1	1.0	1.7	1.0	8.3	5.0
8	imazethapyr	2	EC	0.125	lb ai/a	PO1	2.7	3.0	1.7	10.0	2.7
9	ethofumesate	4	SC	0.5	lb ai/a	PO1	1.3	5.0	1.3	7.7	4.0
10	imazosulfuron	75	WDG	0.2	lb ai/a	PO1	6.7	8.3	3.7	3.7	1.7
11	pendimethalin	3.8	CS	0.95	lb ai/a	PO1	3.0	8.3	3.3	6.7	3.7
	imazamox	1	AS	0.063	lb ai/a	PO1					
12	Untreated					PO1	1.3	4.7	1.0	4.0	1.0
LSD (P=.05)							1.16	3.50	2.36	4.96	4.69
Standard Deviation							0.68	2.06	1.40	2.93	2.77
CV							23.89	37.73	59.8	45.47	60.38

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	COLQ 17/Jul/2009 RATING 1-10	COPU 17/Jul/2009 RATING 1-10	RRPW 17/Jul/2009 RATING 1-10	LEAF 3/Aug/2009 RATING 1-10	HEAD 3/Aug/2009 RATING 1-10
1	pronamide	50	WP	6	lb ai/a	PO1	7.0	1.0	10.0	3.3	4.7
	imazamox	1	AS	0.063	lb ai/a	PO1					
2	sulfentrazone	4	F	0.125	lb ai/a	PO1	9.7	6.7	10.0	5.3	7.0
3	imazosulfuron	75	WDG	0.2	lb ai/a	PO1	5.3	1.0	9.0	5.0	7.0
4	ethofumesate	4	SC	1	lb ai/a	PO1	9.7	4.7	3.0	2.3	3.0
5	imazamox	1	AS	0.031	lb ai/a	PO1	8.7	1.0	9.0	6.0	7.0
6	imazamox	1	AS	0.063	lb ai/a	PO1	7.7	1.0	10.0	3.0	3.3
7	imazethapyr	2	EC	0.063	lb ai/a	PO1	6.0	1.0	1.0	2.3	4.3
8	imazethapyr	2	EC	0.125	lb ai/a	PO1	9.3	2.0	9.0	3.3	3.3
9	ethofumesate	4	SC	0.5	lb ai/a	PO1	9.7	1.7	8.0	2.3	5.3
10	imazosulfuron	75	WDG	0.2	lb ai/a	PO1	9.7	1.0	9.0	7.7	7.7
11	pendimethalin	3.8	CS	0.95	lb ai/a	PO1	9.7	2.0	10.0	4.0	6.7
	imazamox	1	AS	0.063	lb ai/a	PO1					
12	Untreated					PO1	1.0	1.0	1.0	3.3	5.3
LSD (P=.05)							3.31	0.98	.	2.58	2.76
Standard Deviation							1.95	0.58	.	1.53	1.63
CV							25.11	28.87	.	38.13	30.29

Weed Control in Lettuce – Muck Farm 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	ROMAINE 3/Aug/2009 RATING 1-10	LEAF 14/Aug/2009 HARVEST KG	ROMAINE 21/Aug/2009 HARVEST KG
1	pronamide	50	WP	6	lb ai/a	PO1	3.3	4.51	5.05
	imazamox	1	AS	0.063	lb ai/a	PO1			
2	sulfentrazone	4	F	0.125	lb ai/a	PO1	5.3	1.88	1.90
3	imazosulfuron	75	WDG	0.2	lb ai/a	PO1	6.0	1.90	3.39
4	ethofumesate	4	SC	1	lb ai/a	PO1	1.7	5.75	5.50
5	imazamox	1	AS	0.031	lb ai/a	PO1	6.3	1.27	1.56
6	imazamox	1	AS	0.063	lb ai/a	PO1	2.3	3.85	5.53
7	imazethapyr	2	EC	0.063	lb ai/a	PO1	2.0	4.49	4.16
8	imazethapyr	2	EC	0.125	lb ai/a	PO1	1.3	4.93	6.47
9	ethofumesate	4	SC	0.5	lb ai/a	PO1	3.0	4.24	3.73
10	imazosulfuron	75	WDG	0.2	lb ai/a	PO1	6.0	0.67	2.14
11	pendimethalin	3.8	CS	0.95	lb ai/a	PO1	3.0	2.91	4.73
	imazamox	1	AS	0.063	lb ai/a	PO1			
12	Untreated					PO1	2.0	3.74	4.38
LSD (P=.05)							2.37	3.755	2.360
Standard Deviation							1.40	2.217	1.394
CV							39.6	66.26	34.46

Weed Control in Lettuce – Imlay City 2009

Project Code: WC 116-09-01 **Location: Van Dyk Farms**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Romaine Lettuce **Variety: Tall Guzmain**
Planting Method: Seeded **Planting Date: 6/2/09**
Spacing: 12 inch in row **Row Spacing: 10 inch**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 3 ft wide x 30 ft long

Soil Type: Adrian Muck **OM: 62.0%** **pH: 6.9**
Sand: 11.6% **Silt: 24.5%** **Clay: 1.9%** **CEC:**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	6/4/09	12:00 pm	57/57	F	Damp	9 NE	41	0% Cloudy	N
PO1	6/25/09	2:08 pm	85/82	F	Dry	4 NW	54	50% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
6/4	LETTUCE			
6/25	LETTUCE	2-3″	3-4 LF	
6/25	COPU = common purslane	0.25-0.5″	1 LF	Moderate
6/25	PAWE = pineappleweed	0.5-1″		Many
6/25	RRPW = redroot pigweed	0.25″		Moderate

Notes and Comments
1. Sprays applied with 2 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.

Weed Control in Lettuce – Imlay City 2009

Dept. of Horticulture, MSU

Trial ID: WC 116-09-01 Study Director: Dr. Bernard Zandstra
Location: Van Dyk Farms Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code								COPU	PAWE	RRPW	
Description							Lettuce				Lettuce
Rating Date							22/Jun/2009	22/Jun/2009	22/Jun/2009	22/Jun/2009	8/Jul/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	pronamide	50	WP	6	lb ai/a	PRE	1.3	9.7	9.0	9.7	1.7
2	sulfentrazone	4	F	0.125	lb ai/a	PRE	2.3	10.0	10.0	10.0	2.7
3	imazosulfuron	75	WDG	0.2	lb ai/a	PRE	2.7	10.0	10.0	10.0	2.3
4	ethofumesate	4	SC	1	lb ai/a	PRE	4.3	8.7	6.7	9.0	3.0
5	pronamide	50	WP	4	lb ai/a	PRE	1.0	9.0	8.3	9.3	1.3
	imazamox	1	AS	0.031	lb ai/a	PO1					
6	pronamide	50	WP	4	lb ai/a	PRE	1.3	9.3	7.3	9.0	1.7
	imazethapyr	2	EC	0.063	lb ai/a	PRE					
7	pronamide	50	WP	4	lb ai/a	PRE	1.3	9.3	6.7	9.0	2.0
	ethofumesate	4	SC	0.5	lb ai/a	PO1					
8	pronamide	50	WP	4	lb ai/a	PRE	1.0	9.0	5.7	8.7	2.7
	imazosulfuron	75	WDG	0.2	lb ai/a	PO1					
LSD (P=.05)							0.87	1.44	2.89	1.09	1.58
Standard Deviation							0.49	0.82	1.65	0.62	0.90
CV							25.77	8.75	20.77	6.66	41.68

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code							COPU	PAWE		COPU	PAWE
Description									Lettuce		
Rating Date							8/Jul/2009	8/Jul/2009	28/Jul/2009	28/Jul/2009	28/Jul/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	pronamide	50	WP	6	lb ai/a	PRE	9.0	7.7	1.0	6.3	8.0
2	sulfentrazone	4	F	0.125	lb ai/a	PRE	9.3	9.0	2.3	4.7	7.0
3	imazosulfuron	75	WDG	0.2	lb ai/a	PRE	9.7	10.0	1.7	7.0	9.0
4	ethofumesate	4	SC	1	lb ai/a	PRE	7.7	5.0	3.0	5.3	4.3
5	pronamide	50	WP	4	lb ai/a	PRE	10.0	7.7	1.0	7.7	8.0
	imazamox	1	AS	0.031	lb ai/a	PO1					
6	pronamide	50	WP	4	lb ai/a	PRE	10.0	6.3	1.0	7.3	8.0
	imazethapyr	2	EC	0.063	lb ai/a	PRE					
7	pronamide	50	WP	4	lb ai/a	PRE	8.3	3.3	1.3	6.7	7.7
	ethofumesate	4	SC	0.5	lb ai/a	PO1					
8	pronamide	50	WP	4	lb ai/a	PRE	9.0	9.7	2.3	6.7	8.7
	imazosulfuron	75	WDG	0.2	lb ai/a	PO1					
LSD (P=.05)							0.98	3.08	0.68	2.36	2.60
Standard Deviation							0.56	1.76	0.39	1.35	1.49
CV							6.16	23.97	22.58	20.83	19.6

Weed Control in Lettuce – Imlay City 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage			
Pest Code							RRPW		
Description								Lettuce	Lettuce
Rating Date							28/Jul/2009	30/Jul/2009	30/Jul/2009
Rating Data Type							RATING	NUMBER	WEIGHT
Rating Unit							1-10	#/PLOT	KG
1	pronamide	50	WP	6	lb ai/a	PRE	4.3	50	60.25
2	sulfentrazone	4	F	0.125	lb ai/a	PRE	6.3	58	66.12
3	imazosulfuron	75	WDG	0.2	lb ai/a	PRE	10.0	61	68.89
4	ethofumesate	4	SC	1	lb ai/a	PRE	4.3	46	51.88
5	pronamide	50	WP	4	lb ai/a	PRE	5.0	58	70.04
	imazamox	1	AS	0.031	lb ai/a	PO1			
6	pronamide	50	WP	4	lb ai/a	PRE	7.3	55	68.35
	imazethapyr	2	EC	0.063	lb ai/a	PRE			
7	pronamide	50	WP	4	lb ai/a	PRE	5.0	64	65.25
	ethofumesate	4	SC	0.5	lb ai/a	PO1			
8	pronamide	50	WP	4	lb ai/a	PRE	10.0	61	62.00
	imazosulfuron	75	WDG	0.2	lb ai/a	PO1			
LSD (P=.05)							3.67	15.7	18.138
Standard Deviation							2.09	9.0	10.357
CV							32.0	15.85	16.16

Weed Control in Mint – St. Johns 2009

Project Code: WC 121-09-01 **Location: Irrer Farm**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Native Spearmint **Variety: See notes**
Planting Method: Roots **Planting Date: 2000**
Spacing: meadow mint **Row Spacing:**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 6 ft wide x 35 ft long

Soil Type: Gilford Loam **OM: 3.4%** **pH: 6.2**
Sand: 57.1% **Silt: 29.2%** **Clay: 13.7%** **CEC: 10.0**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	4/9/09	1:00 pm	54/46	F	Damp	7 SW	29	10% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/9	MINT		Pre-emerge	
4/9	COCW = common chickweed	1-2″		Few
4/9	FIPA = field pansy	1-3″		Moderate
4/9	WHCA = white campion	2-3″		Few

Notes and Comments
1. Sprays applied with 5 ft boom FF8002, 20 gpa, 30 psi, CO2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.

Weed Control in Mint – St. Johns 2009

Dept. of Horticulture, MSU

Trial ID: WC 121-09-01 Study Director: Dr. Bernard Zandstra
Location: Irrer Farm Investigator: Rodney Tocco

Pest Code								ATRI	FIPA	WHCA
Description							Mint			
Rating Date							22/Jun/2009	22/Jun/2009	22/Jun/2009	22/Jun/2009
Rating Data Type							RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage				
							1.3	9.7	8.0	7.7
1	terbacil	80	WP	0.8	lb ai/a	PRE	2.3	10.0	6.7	10.0
2	terbacil	80	WP	1.6	lb ai/a	PRE	2.3	10.0	10.0	9.3
3	oxyfluorfen	2	L	0.31	lb ai/a	PRE				
	paraquat	2	L	0.375	lb ai/a	PRE				
	flumioxazin	51	WDG	0.128	lb ai/a	PRE				
	NIS	100	SL	0.25	% v/v	PRE	1.3	10.0	9.3	9.3
4	paraquat	2	L	0.375	lb ai/a	PRE				
	flumioxazin	51	WDG	0.128	lb ai/a	PRE				
	terbacil	80	WP	0.32	lb ai/a	PRE				
	NIS	100	SL	0.25	% v/v	PRE	1.0	9.7	8.3	9.0
5	oxyfluorfen	2	EC	0.31	lb ai/a	PRE				
	clomazone	3	ME	0.5	lb ai/a	PRE				
	NIS	100	SL	0.25	% v/v	PRE	3.7	9.3	8.3	9.3
6	flumioxazin	51	WDG	0.128	lb ai/a	PRE				
	fluroxypyr	2.8	L	0.23	lb ai/a	PRE				
	NIS	100	SL	0.25	% v/v	PRE	4.7	10.0	9.3	9.3
7	flumioxazin	51	WDG	0.128	lb ai/a	PRE				
	fluroxypyr	2.8	L	0.46	lb ai/a	PRE				
	NIS	100	SL	0.25	% v/v	PRE	3.0	9.7	9.3	9.7
8	flumioxazin	51	WDG	0.128	lb ai/a	PRE				
	fluroxypyr	2.8	L	0.23	lb ai/a	PRE				
	terbacil	80	WP	0.32	lb ai/a	PRE				
	NIS	100	SL	0.25	% v/v	PRE	1.7	8.7	4.0	9.7
9	paraquat	2	L	0.375	lb ai/a	PRE				
	fluroxypyr	2.8	L	0.23	lb ai/a	PRE				
	NIS	100	SL	0.25	% v/v	PRE	1.7	9.3	6.0	10.0
10	paraquat	2	L	0.375	lb ai/a	PRE				
	fluroxypyr	2.8	L	0.46	lb ai/a	PRE				
	NIS	100	SL	0.25	% v/v	PRE	2.0	9.0	6.0	9.0
11	sulfentrazone	4	F	0.188	lb ai/a	PRE				
	terbacil	80	WP	0.32	lb ai/a	PRE	1.7	10.0	9.0	10.0
12	sulfentrazone	4	F	0.28	lb ai/a	PRE				
	terbacil	80	WP	0.32	lb ai/a	PRE	1.3	9.7	8.0	7.7
LSD (P=.05)							1.49	1.31	3.55	2.56
Standard Deviation							0.88	0.77	2.10	1.51
CV							39.69	8.03	26.7	16.15

Preemergence Weed Control in Onion – Muck Farm 2009

Project Code: 112-09-01 **Location: Laingsburg, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Onion **Variety: See notes**
Planting Method: Seeded **Planting Date: 5/13/09**
Spacing: 0.75 IN **Row Spacing: 16 IN**
Tillage Type: Conventional **Study Design: RCB** **Replications: 4**
Plot Size: 5.5 ft wide x 25 ft long

Soil Type: Houghton Muck **OM: 78.4%** **pH: 6.9**
Sand: 2.6% **Silt: 17.8%** **Clay: 1.2%** **CEC:**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	5/15/09	10:00 am	52/51	F	Moist	1 S	94	100%Cloudy	N
PO1	6/26/09	11:00 am	77/71	F	Moist	1 SW	59	100%Cloudy	N
PO2	7/14/09	10:00 am	67/62	F	Dry	6 S	54	100%Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/15	ONION		PRE	
6/26	ONION	3-5″	2 LF	
6/26	COLQ = common lambsquarters	0.5-1″		few
6/26	LATH = ladysthumb	0.5-1″		few
6/26	YENS = yellow nutsedge	3-4″		many
6/26	RRPW = redroot pigweed	2-4″		few
7/14	ONION	10-14″	4-5 LF	
7/14	LATH = ladysthumb	1-3″		few
7/14	YENS = yellow nutsedge	1-3″		few

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. Three rows were 16 inches apart on a raised bed.
4. V1 East- Sherman, V2 Middle- Festival, V3 West- Santana. The 3 cultivars were combined for yield calculation.
5. Field was flooded twice during the season. Stands and yield reduced.
6. Yellow nutsedge was a major problem and had to be removed by hand.

Preemergence Weed Control in Onion – Muck Farm 2009

Dept. of Horticulture, MSU

Trial ID: 112-09-01 Study Director: Dr. Bernard Zandstra
Location: Muck Farm, Laingsburg Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stage	ONION Rating 1-10 10/Jun/09	COLQ Rating 1-10 10/Jun/09	LATH Rating 1-10 10/Jun/09	RRPW Rating 1-10 10/Jun/09	YENS Rating 1-10 10/Jun/09
1	pendimethalin	3.8	CS	2	lb a/a	PRE	1.0	10.0	5.3	5.5	2.3
	pendimethalin	3.8	CS	2	lb a/a	PO1, 2					
2	pendimethalin	3.8	CS	4	lb a/a	PRE	1.3	10.0	8.3	8.5	2.3
	pendimethalin	3.8	CS	4	lb a/a	PO1, 2					
3	pendimethalin	3.3	EC	2	lb a/a	PRE	1.3	10.0	4.5	6.5	2.3
	pendimethalin	3.3	EC	2	lb a/a	PO1, 2					
4	s-metolachlor	7.62	EC	1.3	lb a/a	PRE	2.3	3.3	3.3	8.5	6.8
	s-metolachlor	7.62	EC	1.3	lb a/a	PO1, 2					
5	dimethenamid-p	6	EC	0.98	lb a/a	PRE	3.2	4.5	5.0	9.8	7.5
	dimethenamid-p	6	EC	0.98	lb a/a	PO1, 2					
6	propachlor	4	F	4	lb a/a	PRE	1.3	6.8	5.5	9.8	6.5
	propachlor	4	F	4	lb a/a	PO1, 2					
7	acetochlor	6.4	EC	1	lb a/a	PRE	3.1	7.3	5.0	10.0	6.8
	acetochlor	6.4	EC	1	lb a/a	PO1, 2					
8	ethofumesate	4	SC	1	lb a/a	PRE	1.0	1.8	4.3	6.0	3.0
	ethofumesate	4	SC	1	lb a/a	PO1, 2					
9	flumioxazin	51	WDG	0.032	lb a/a	PRE	2.1	3.5	4.5	9.0	2.5
	flumioxazin	51	WDG	0.032	lb a/a	PO1, 2					
10	pendimethalin	3.8	CS	2	lb a/a	PRE	1.0	10.0	6.8	5.8	2.5
	pendimethalin	3.3	EC	2	lb a/a	PO1, 2					
11	pendimethalin	3.8	CS	2	lb a/a	PRE	1.1	10.0	5.0	6.3	2.0
	dimethenamid-p	6	EC	0.98	lb a/a	PO1					
	s-metolachlor	7.62	EC	1.3	lb a/a	PO2					
12	pendimethalin	3.8	CS	2	lb a/a	PRE	1.1	10.0	5.5	6.0	2.0
	s-metolachlor	7.62	EC	1.3	lb a/a	PO1					
	dimethenamid-p	6	EC	0.98	lb a/a	PO2					
13	pendimethalin	3.8	CS	2	lb a/a	PRE	1.1	10.0	5.0	5.8	1.5
	flumioxazin	51	WDG	0.032	lb a/a	PO1, 2					
14	pendimethalin	3.8	CS	2	lb a/a	PRE	1.2	10.0	6.5	6.0	2.0
	dimethenamid-p	6	EC	0.98	lb a/a	PO1					
	flumioxazin	51	WDG	0.064	lb a/a	PO2					
15	pendimethalin	3.8	CS	2	lb a/a	PRE	1.0	10.0	6.3	6.8	2.5
	acetochlor	6.4	EC	1	lb a/a	PO1, 2					
16	Handweeded						1.0	1.0	1.0	1.0	1.0
LSD (P=.05)							0.43	1.18	1.54	1.11	1.31
Standard Deviation							0.30	0.82	1.08	0.78	0.92
CV							19.76	11.16	21.14	11.24	27.55

Preemergence Weed Control in Onion – Muck Farm 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stg	ONION Rating 1-10 14/Jul/09	ONION Harvest KG/plot 15/Oct/09
1	pendimethalin	3.8	CS	2	lb a/a	PRE	3.5	15.65
	pendimethalin	3.8	CS	2	lb a/a	PO1, 2		
2	pendimethalin	3.8	CS	4	lb a/a	PRE	2.7	16.85
	pendimethalin	3.8	CS	4	lb a/a	PO1, 2		
3	pendimethalin	3.3	EC	2	lb a/a	PRE	3.8	19.08
	pendimethalin	3.3	EC	2	lb a/a	PO1, 2		
4	s-metolachlor	7.62	EC	1.3	lb a/a	PRE	4.8	12.12
	s-metolachlor	7.62	EC	1.3	lb a/a	PO1, 2		
5	dimethenamid-p	6	EC	0.98	lb a/a	PRE	3.6	10.40
	dimethenamid-p	6	EC	0.98	lb a/a	PO1, 2		
6	propachlor	4	F	4	lb a/a	PRE	2.7	11.55
	propachlor	4	F	4	lb a/a	PO1, 2		
7	acetochlor	6.4	EC	1	lb a/a	PRE	3.3	18.95
	acetochlor	6.4	EC	1	lb a/a	PO1, 2		
8	ethofumesate	4	SC	1	lb a/a	PRE	4.8	7.76
	ethofumesate	4	SC	1	lb a/a	PO1, 2		
9	flumioxazin	51	WDG	0.032	lb a/a	PRE	4.3	11.85
	flumioxazin	51	WDG	0.032	lb a/a	PO1, 2		
10	pendimethalin	3.8	CS	2	lb a/a	PRE	2.8	21.31
	pendimethalin	3.3	EC	2	lb a/a	PO1, 2		
11	pendimethalin	3.8	CS	2	lb a/a	PRE	3.2	12.89
	dimethenamid-p	6	EC	0.98	lb a/a	PO1		
	s-metolachlor	7.62	EC	1.3	lb a/a	PO2		
12	pendimethalin	3.8	CS	2	lb a/a	PRE	3.4	9.45
	s-metolachlor	7.62	EC	1.3	lb a/a	PO1		
	dimethenamid-p	6	EC	0.98	lb a/a	PO2		
13	pendimethalin	3.8	CS	2	lb a/a	PRE	4.3	7.79
	flumioxazin	51	WDG	0.032	lb a/a	PO1, 2		
14	pendimethalin	3.8	CS	2	lb a/a	PRE	3.2	17.57
	dimethenamid-p	6	EC	0.98	lb a/a	PO1		
	flumioxazin	51	WDG	0.064	lb a/a	PO2		
15	pendimethalin	3.8	CS	2	lb a/a	PRE	2.8	20.91
	acetochlor	6.4	EC	1	lb a/a	PO1, 2		
16	Handweeded						7.1	1.10
LSD (P=.05)							1.78	11.922
Standard Deviation							1.25	8.343
CV							33.17	62.02

Postemergence Weed Control in Onion – Muck Farm 2009

Project Code: 112-09-02 **Location: Laingsburg, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Onion **Variety: See notes**
Planting Method: Seeded **Planting Date: 5/13/09**
Spacing: 0.75 IN **Row Spacing: 16 IN**
Tillage Type: Conventional **Study Design: RCB** **Replications: 4**
Plot Size: 5.5 ft wide x 25 ft long

Soil Type: Houghton Muck **OM: 78.0%** **pH: 6.8**
Sand: 5.3% **Silt: 15%** **Clay: 1.7%** **CEC:**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PO1	6/18/09	11:45 am	70/62	F	Moist	3 NE	72	100%Cloudy	N
PO2	7/14/09	1:00 pm	78/70	F	Moist	6 S	63	100%Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
6/18	ONION	3-4″	2 LF	
6/18	YENS = yellow nutsedge	1-3″		many
6/18	LATH = ladysthumb	1-3″		moderate
7/14	ONION	8-12″	4 LF	
7/14	COPU = common purslane	1-3″		few
7/14	LATH = ladysthumb	2-8″		few
7/14	YENS = yellow nutsedge	2-5″		many
7/14	RRPW = redroot pigweed	1-3″		moderate

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. Three rows were 16 inches apart on a raised bed.
4. V1 East- Sherman, V2 Middle- Festival, V3 West- Santana. The 3 cultivars were combined for yield calculation.
5. Field was flooded twice during the season. Stands and yield reduced.
6. Yellow nutsedge was a major problem and had to be removed by hand.

Postemergence Weed Control in Onion – Muck Farm 2009

Trial ID: WC 112-09-02 Study Director: Dr. Bernard Zandstra
Location: Muck Farm, Laingsburg Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stage	ONION Rating 1-10 24/Jun/09	COPU Rating 1-10 24/Jun/09	LATH Rating 1-10 24/Jun/09	RRPW Rating 1-10 24/Jun/09	SPSP Rating 1-10 24/Jun/09
1	oxyfluorfen	2	EC	0.063	lb a/a	PO1,2	2.1	10.0	7.8	9.0	5.8
2	oxyfluorfen	4	SC	0.063	lb a/a	PO1,2	1.3	9.8	4.8	9.5	8.8
3	flumioxazin	51	WDG	0.032	lb a/a	PO1,2	1.8	9.5	5.8	9.8	8.8
4	flumioxazin	51	WDG	0.064	lb a/a	PO1,2	2.1	10.0	6.5	10.0	9.0
5	ethofumesate	4	SC	0.5	lb a/a	PO1,2	1.4	6.0	4.0	2.5	5.3
6	ethofumesate	4	SC	1	lb a/a	PO1,2	1.3	5.0	3.5	2.8	5.3
7	fluroxypyr	2.8	L	0.125	lb a/a	PO1,2	3.8	8.0	4.3	4.0	7.3
8	fluroxypyr	2.8	L	0.25	lb a/a	PO1,2	4.8	9.3	6.3	6.0	9.0
9	bentazon	4	L	1	lb a/a	PO1,2	5.2	10.0	10.0	4.8	9.0
10	bromoxynil	2	EC	0.125	lb a/a	PO1,2	2.7	3.5	6.0	8.0	5.5
11	bromoxynil	2	EC	0.25	lb a/a	PO1,2	2.7	3.8	8.8	8.3	7.3
12	oxyfluorfen	4	SC	0.063	lb a/a	PO1,2	3.0	10.0	7.0	10.0	7.8
	flumioxazin	51	WDG	0.032	lb a/a	PO1,2					
13	oxyfluorfen	4	SC	0.063	lb a/a	PO1,2	2.2	10.0	7.5	9.3	9.3
	ethofumesate	4	SC	0.5	lb a/a	PO1,2					
14	oxyfluorfen	4	SC	0.063	lb a/a	PO1,2	4.5	9.8	7.8	9.8	9.5
	fluroxypyr	2.8	L	0.125	lb a/a	PO1,2					
15	oxyfluorfen	4	SC	0.063	lb a/a	PO1,2	4.9	10.0	9.0	9.8	8.3
	bromoxynil	2	EC	0.125	lb a/a	PO1,2					
16	Handweeded						1.0	1.0	1.0	1.0	1.0
LSD (P=.05)							1.61	1.32	1.47	1.57	2.22
Standard Deviation							1.12	0.92	1.03	1.10	1.56
CV							40.29	11.78	16.54	15.41	21.36

Postemergence Weed Control in Onion – Muck Farm 2009

Dept. of Horticulture, MSU

Weed Code							YENS		COLQ	COPU	LACG
Crop Code								ONION			
Rating Data Type							Rating	Rating	Rating	Rating	Rating
Rating Unit							1-10	1-10	1-10	1-10	1-10
Rating Date							24/Jun/09	22/Jul/09	22/Jul/09	22/Jul/09	22/Jul/09
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stage					
1	oxyfluorfen	2	EC	0.063	lb a/a	PO1,2	2.3	2.8	9.3	10.0	4.0
2	oxyfluorfen	4	SC	0.063	lb a/a	PO1,2	2.0	2.2	8.5	10.0	3.3
3	flumioxazin	51	WDG	0.032	lb a/a	PO1,2	2.3	2.5	8.0	10.0	7.0
4	flumioxazin	51	WDG	0.064	lb a/a	PO1,2	2.5	2.4	9.5	10.0	8.8
5	ethofumesate	4	SC	0.5	lb a/a	PO1,2	1.0	3.3	7.0	7.5	6.0
6	ethofumesate	4	SC	1	lb a/a	PO1,2	1.3	3.2	7.3	7.5	6.8
7	fluroxypyr	2.8	L	0.125	lb a/a	PO1,2	1.8	5.3	4.3	10.0	5.0
8	fluroxypyr	2.8	L	0.25	lb a/a	PO1,2	2.0	6.0	5.0	10.0	5.5
9	bentazon	4	L	1	lb a/a	PO1,2	9.0	3.0	6.8	9.5	2.0
10	bromoxynil	2	EC	0.125	lb a/a	PO1,2	1.5	3.8	8.8	1.3	4.0
11	bromoxynil	2	EC	0.25	lb a/a	PO1,2	2.0	4.4	10.0	2.5	4.0
12	oxyfluorfen	4	SC	0.063	lb a/a	PO1,2	2.8	3.8	9.8	10.0	7.5
	flumioxazin	51	WDG	0.032	lb a/a	PO1,2					
13	oxyfluorfen	4	SC	0.063	lb a/a	PO1,2	2.8	2.2	9.8	10.0	6.8
	ethofumesate	4	SC	0.5	lb a/a	PO1,2					
14	oxyfluorfen	4	SC	0.063	lb a/a	PO1,2	2.5	3.8	8.3	10.0	7.3
	fluroxypyr	2.8	L	0.125	lb a/a	PO1,2					
15	oxyfluorfen	4	SC	0.063	lb a/a	PO1,2	2.8	3.3	10.0	10.0	5.5
	bromoxynil	2	EC	0.125	lb a/a	PO1,2					
16	Handweeded						1.0	3.9	1.0	1.0	1.0
LSD (P=.05)							0.72	1.35	2.40	1.15	1.55
Standard Deviation							0.51	0.95	1.68	0.80	1.09
CV							20.68	27.0	21.85	9.93	20.63

Postemergence Weed Control in Onion – Muck Farm 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stage	LATH	RRPW	SPSP	YENS	ONION
Weed Code							LATH	RRPW	SPSP	YENS	
Crop Code											ONION
Rating Data Type							Rating	Rating	Rating	Rating	Yield
Rating Unit							1-10	1-10	1-10	1-10	KG/plot
Rating Date							22/Jul/09	22/Jul/09	22/Jul/09	22/Jul/09	8/Oct/07
1	oxyfluorfen	2	EC	0.063	lb a/a	PO1,2	7.0	10.0	2.5	2.0	14.85
2	oxyfluorfen	4	SC	0.063	lb a/a	PO1,2	5.3	8.5	3.0	2.3	14.75
3	flumioxazin	51	WDG	0.032	lb a/a	PO1,2	7.5	10.0	8.8	2.8	15.82
4	flumioxazin	51	WDG	0.064	lb a/a	PO1,2	10.0	10.0	9.5	3.5	19.84
5	ethofumesate	4	SC	0.5	lb a/a	PO1,2	3.8	3.5	7.5	2.5	9.87
6	ethofumesate	4	SC	1	lb a/a	PO1,2	2.5	4.3	6.0	2.3	10.32
7	fluroxypyr	2.8	L	0.125	lb a/a	PO1,2	5.3	3.0	8.3	2.0	4.67
8	fluroxypyr	2.8	L	0.25	lb a/a	PO1,2	6.3	3.3	9.3	2.0	7.41
9	bentazon	4	L	1	lb a/a	PO1,2	10.0	5.0	2.3	8.8	18.27
10	bromoxynil	2	EC	0.125	lb a/a	PO1,2	3.3	3.0	4.8	1.5	10.85
11	bromoxynil	2	EC	0.25	lb a/a	PO1,2	9.0	6.3	7.5	1.3	7.91
12	oxyfluorfen	4	SC	0.063	lb a/a	PO1,2	9.8	10.0	9.5	3.5	19.62
	flumioxazin	51	WDG	0.032	lb a/a	PO1,2					
13	oxyfluorfen	4	SC	0.063	lb a/a	PO1,2	8.8	8.3	7.0	3.5	16.85
	ethofumesate	4	SC	0.5	lb a/a	PO1,2					
14	oxyfluorfen	4	SC	0.063	lb a/a	PO1,2	8.3	9.5	9.0	2.8	15.14
	fluroxypyr	2.8	L	0.125	lb a/a	PO1,2					
15	oxyfluorfen	4	SC	0.063	lb a/a	PO1,2	9.8	10.0	5.0	2.5	15.95
	bromoxynil	2	EC	0.125	lb a/a	PO1,2					
16	Handweeded						1.0	1.0	1.0	1.0	6.63
LSD (P=.05)							1.53	1.61	2.72	0.96	8.164
Standard Deviation							1.07	1.12	1.90	0.67	5.713
CV							16.01	17.04	30.19	24.39	43.79

Postemergence Weed Control with Basagran in Onion – Muck Farm 2009

Project Code: 112-09-03 **Location: Laingsburg, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Onion **Variety: See notes**
Planting Method: Seeded **Planting Date: 5/13/09**
Spacing: 0.75 IN **Row Spacing: 16 IN**
Tillage Type: Conventional **Study Design: RCB** **Replications: 4**
Plot Size: 5.5 ft wide x 25 ft long

Soil Type: Houghton Muck **OM: 77.4%** **pH: 6.8**
Sand: 0.7% **Silt: 21.2%** **Clay: 0.7%** **CEC:**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PO1	6/18/09	11:00 am	66/64	F	Moist	1 S	83.9	100%Cloudy	N
PO2	6/25/09	11:00 am	83/75	F	Moist	1 SW	57.6	30% Cloudy	N
PO3	7/08/09	2:30 pm	80/61	F	Dry	2 SW	75.4	80% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
6/18	ONION	3-4″	2 LF	
6/18	YENS = yellow nutsedge	3-4″		many
6/25	ONION	6-8″	3 LF	
6/25	YENS = yellow nutsedge	8-12″		many
6/25	COLQ = common lambsquarters	2-3″		few
7/8	ONION	8-20″	4 LF	
7/8	YENS = yellow nutsedge	12-20″		many
7/8	RRPW = redroot pigweed	4-8″		moderate
7/8	LACG = large crabgrass	6-12″		moderate
7/8	COLQ = common lambsquarters	4-6″		few

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. Three rows were 16 inches apart on a raised bed.
4. V1 East- Highlander, V2 Middle- Nebula, V3 West- T-439. The 3 cultivars were combined for yield calculation.
5. Field was flooded twice during the season. Stands and yield reduced.

Postemergence Weed Control with Basagran in Onion – Muck Farm 2009

Dept. of Horticulture, MSU

Trial ID: WC 112-09-03 Study Director: Dr. Bernard Zandstra
Location: Muck Farm, Laingsburg Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stage	ONION	COPU	LATH	RRPW	YENS
Weed Code								COPU	LATH	RRPW	YENS
Crop Code							ONION				
Rating Data Type							Rating	Rating	Rating	Rating	Rating
Rating Unit							1-10	1-10	1-10	1-10	1-10
Rating Date							24/Jun/09	24/Jun/09	24/Jun/09	24/Jun/09	24/Jun/09
1	bentazon	4	L	0.5	lb a/a	PO1, 3	4.3	10.0	9.8	6.5	4.5
2	bentazon	4	L	1	lb a/a	PO1, 3	5.0	10.0	8.0	8.5	9.3
3	bentazon	4	L	0.5	lb a/a	PO1, 3	6.9	9.8	9.8	6.5	4.3
	COC		L	1	% v/v	PO1, 3					
4	bentazon	4	L	1	lb a/a	PO1, 3	8.7	10.0	8.5	8.0	8.8
	COC		L	1	% v/v	PO1, 3					
5	bentazon	4	L	0.5	lb a/a	PO1, 3	5.0	10.0	10.0	9.3	5.5
	oxyfluorfen	4	SC	0.063	lb a/a	PO1, 3					
6	bentazon	4	L	0.5	lb a/a	PO1, 3	3.8	10.0	10.0	10.0	5.5
	flumioxazin	51	WDG	0.032	lb a/a	PO1, 3					
7	bentazon	4	L	0.5	lb a/a	PO2,3	1.0	1.0	1.0	1.0	1.0
8	bentazon	4	L	1	lb a/a	PO2,3	1.0	1.0	1.0	1.0	1.0
9	bentazon	4	L	0.5	lb a/a	PO2,3	1.0	1.0	1.0	1.0	1.0
	COC		L	1	% v/v	PO2,3					
10	bentazon	4	L	1	lb a/a	PO2,3	1.0	1.0	1.0	1.0	1.0
	COC		L	1	% v/v	PO2,3					
11	bentazon	4	L	0.5	lb a/a	PO2,3	1.0	1.0	1.0	1.0	1.0
	NIS		L	0.25	% v/v	PO2,3					
12	bentazon	4	L	1	lb a/a	PO2,3	1.0	1.0	1.0	1.0	1.0
	NIS		L	0.25	% v/v	PO2,3					
13	Handweeded						1.0	1.0	1.0	1.0	1.0
LSD (P=.05)							0.98	0.20	1.61	1.50	0.82
Standard Deviation							0.68	0.14	1.13	1.05	0.57
CV							21.87	2.7	23.26	24.53	16.64

Postemergence Weed Control with Basagran in Onion – Muck Farm 2009

Dept. of Horticulture, MSU

Weed Code							RRPW	YENS		COLQ	RRPW
Crop Code						ONION			ONION		
Rating Data Type						Rating	Rating	Rating	Rating	Rating	Rating
Rating Unit						1-10	1-10	1-10	1-10	1-10	1-10
Rating Date						6/Jul/09	6/Jul/09	6/Jul/09	14/Jul/09	14/Jul/09	14/Jul/09
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stage					
1	bentazon	4	L	0.5	lb a/a	PO1, 3	2.5	7.3	4.5	3.0	8.5	8.3
2	bentazon	4	L	1	lb a/a	PO1, 3	3.8	8.3	8.3	3.8	7.3	8.5
3	bentazon	4	L	0.5	lb a/a	PO1, 3	3.7	7.0	4.0	5.8	8.8	6.5
	COC		L	1	% v/v	PO1, 3						
4	bentazon	4	L	1	lb a/a	PO1, 3	6.1	8.5	8.3	7.4	9.5	8.0
	COC		L	1	% v/v	PO1, 3						
5	bentazon	4	L	0.5	lb a/a	PO1, 3	2.2	9.8	3.5	3.0	8.8	9.5
	oxyfluorfen	4	SC	0.063	lb a/a	PO1, 3						
6	bentazon	4	L	0.5	lb a/a	PO1, 3	2.1	10.0	6.0	2.3	10.0	10.0
	flumioxazin	51	WDG	0.032	lb a/a	PO1, 3						
7	bentazon	4	L	0.5	lb a/a	PO2,3	1.8	4.8	3.8	2.9	4.8	5.8
8	bentazon	4	L	1	lb a/a	PO2,3	2.0	6.0	7.5	2.2	7.8	6.8
9	bentazon	4	L	0.5	lb a/a	PO2,3	2.3	4.3	4.5	3.3	6.3	5.5
	COC		L	1	% v/v	PO2,3						
10	bentazon	4	L	1	lb a/a	PO2,3	2.3	5.5	6.8	3.2	9.5	7.0
	COC		L	1	% v/v	PO2,3						
11	bentazon	4	L	0.5	lb a/a	PO2,3	2.1	4.5	4.8	2.4	7.3	5.3
	NIS		L	0.25	% v/v	PO2,3						
12	bentazon	4	L	1	lb a/a	PO2,3	2.3	6.0	7.0	3.1	9.5	6.3
	NIS		L	0.25	% v/v	PO2,3						
13	Handweeded						1.0	1.0	1.0	3.8	1.0	1.0
LSD (P=.05)							1.18	2.32	0.98	1.15	2.21	2.17
Standard Deviation							0.83	1.61	0.69	0.81	1.55	1.52
CV							31.51	25.22	12.84	22.79	20.4	22.38

Postemergence Weed Control with Basagran in Onion – Muck Farm 2009

Dept. of Horticulture, MSU

Weed Code							LATH	YENS	
Crop Code									ONION
Rating Data Type							Rating	Rating	Harvest
Rating Unit							1-10	1-10	KG/plot
Rating Date							14/Jul/09	14/Jul/09	6/Oct/09
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stage			
1	bentazon	4	L	0.5	lb a/a	PO1, 3	10.0	6.0	8.67
2	bentazon	4	L	1	lb a/a	PO1, 3	10.0	9.3	6.88
3	bentazon	4	L	0.5	lb a/a	PO1, 3	10.0	4.8	4.51
	COC		L	1	% v/v	PO1, 3			
4	bentazon	4	L	1	lb a/a	PO1, 3	10.0	10.0	1.49
	COC		L	1	% v/v	PO1, 3			
5	bentazon	4	L	0.5	lb a/a	PO1, 3	10.0	4.3	10.02
	oxyfluorfen	4	SC	0.063	lb a/a	PO1, 3			
6	bentazon	4	L	0.5	lb a/a	PO1, 3	10.0	5.5	11.99
	flumioxazin	51	WDG	0.032	lb a/a	PO1, 3			
7	bentazon	4	L	0.5	lb a/a	PO2,3	10.0	5.3	5.44
8	bentazon	4	L	1	lb a/a	PO2,3	10.0	10.0	13.25
9	bentazon	4	L	0.5	lb a/a	PO2,3	10.0	7.3	6.14
	COC		L	1	% v/v	PO2,3			
10	bentazon	4	L	1	lb a/a	PO2,3	10.0	10.0	7.56
	COC		L	1	% v/v	PO2,3			
11	bentazon	4	L	0.5	lb a/a	PO2,3	10.0	7.3	10.53
	NIS		L	0.25	% v/v	PO2,3			
12	bentazon	4	L	1	lb a/a	PO2,3	10.0	10.0	9.20
	NIS		L	0.25	% v/v	PO2,3			
13	Handweeded						1.0	1.0	5.95
LSD (P=.05)							0.00	1.15	5.380
Standard Deviation							0.00	0.81	3.765
CV							0.0	11.59	48.16

Postemergence Weed Control with Chateau in Onion – Muck Farm 2009

Project Code: 112-09-04 **Location:** Laingsburg, MI

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Onion **Variety:** See notes
Planting Method: Seeded **Planting Date:** 5/13/09
Spacing: 0.75 IN **Row Spacing:** 16 IN
Tillage Type: Conventional **Study Design:** RCB **Replications:** 4
Plot Size: 5.5 ft wide x 25 ft long

Soil Type: Houghton Muck **OM:** 76.9% **pH:** 6.8
Sand: 5.5% **Silt:** 16.6% **Clay:** 1.0% **CEC:**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PO1	6/18/09	10:00 am	68/60	F	Moist	2 NE	72	100%Cloudy	N
PO2	7/14/09	2:00 pm	78/70	F	Moist	6 S	63	100%Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
6/18	ONION	3-4″	2 LF	
6/18	YENS = yellow nutsedge	1-3″		moderate
6/18	LATH = ladysthumb	1-3″		moderate
7/14	ONION	8-12″	4 LF	
7/14	YENS = yellow nutsedge	1-5″		many
7/14	COLR = common lambsquarters	1-5″		moderate
7/14	COPU = common purslane	3-4″		moderate
7/14	LATH = ladysthumb	2-4″		moderate

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. Three rows were 16 inches apart on a raised bed.
4. V1 East- Sherman, V2 Middle- Festival, V3 West- Santana. The 3 cultivars were combined for yield calculation.
5. Field was flooded twice during the season. Stands and yield reduced.
6. Yellow nutsedge was a major problem and had to be removed by hand.

Postemergence Weed Control with Chateau in Onion – Muck Farm 2009

Dept. of Horticulture, MSU

Trial ID: 112-09-04 Study Director: Dr. Bernard Zandstra
Location: Muck Farm, Laingsburg Investigator: Rodney Tocco

Weed Code								COPU	LATH	RRPW	YENS
Crop Code							ONION				
Rating Data Type							Rating	Rating	Rating	Rating	Rating
Rating Unit							1-10	1-10	1-10	1-10	1-10
Rating Date							24/Jun/09	24/Jun/09	24/Jun/09	24/Jun/09	24/Jun/09
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stage					
1	flumioxazin	51	WDG	0.064	lb a/a	PO1,2	2.1	10.0	5.5	10.0	2.3
	pendimethalin	3.8	CS	2	lb a/a	PO1,2					
2	flumioxazin	51	WDG	0.064	lb a/a	PO1,2	7.8	10.0	10.0	10.0	6.0
	pendimethalin	3.3	EC	2	lb a/a	PO1,2					
3	flumioxazin	51	WDG	0.064	lb a/a	PO1,2	7.7	10.0	10.0	10.0	6.5
	dimethenamid-p	6	EC	0.98	lb a/a	PO1,2					
4	flumioxazin	51	WDG	0.064	lb a/a	PO1,2	7.8	10.0	9.8	10.0	6.3
	s-metolachlor	7.62	EC	1.3	lb a/a	PO1,2					
5	flumioxazin	51	WDG	0.064	lb a/a	PO1,2	2.8	10.0	5.5	10.0	2.0
6	flumioxazin	51	WDG	0.032	lb a/a	PO1,2	2.8	10.0	5.5	10.0	2.0
	pendimethalin	3.8	CS	2	lb a/a	PO1,2					
7	flumioxazin	51	WDG	0.032	lb a/a	PO1,2	7.3	10.0	10.0	10.0	3.3
	pendimethalin	3.3	EC	2	lb a/a	PO1,2					
8	flumioxazin	51	WDG	0.032	lb a/a	PO1,2	7.9	10.0	9.8	10.0	6.0
	dimethenamid-p	6	EC	0.98	lb a/a	PO1,2					
9	flumioxazin	51	WDG	0.032	lb a/a	PO1,2	7.8	10.0	10.0	10.0	5.3
	s-metolachlor	7.62	EC	1.3	lb a/a	PO1,2					
10	flumioxazin	51	WDG	0.032	lb a/a	PO1,2	2.0	10.0	4.5	10.0	2.0
11	flumioxazin	51	WDG	0	lb a/a		1.7	1.0	1.0	1.0	1.0
	pendimethalin	3.8	CS	2	lb a/a	PO1,2					
12	flumioxazin	51	WDG	0	lb a/a		2.1	1.5	1.5	1.5	1.3
	pendimethalin	3.3	EC	2	lb a/a	PO1,2					
13	flumioxazin	51	WDG	0	lb a/a		5.3	6.0	6.0	6.0	5.3
	dimethenamid-p	6	EC	0.98	lb a/a	PO1,2					
14	flumioxazin	51	WDG	0	lb a/a		2.6	1.5	1.5	1.5	1.3
	s-metolachlor	7.62	EC	1.3	lb a/a	PO1,2					
15	flumioxazin	51	WDG	0	lb a/a		1.0	1.0	1.0	1.0	1.0
LSD (P=.05)							1.44	1.82	2.01	1.82	1.24
Standard Deviation							1.01	1.28	1.41	1.28	0.87
CV							22.03	17.25	23.11	17.25	25.47

Postemergence Weed Control with Chateau in Onion – Muck Farm 2009

Weed Code								COLQ	COPU	LACG	LATH
Crop Code							ONION				
Rating Data Type							Rating	Rating	Rating	Rating	Rating
Rating Unit							1-10	1-10	1-10	1-10	1-10
Rating Date							22/Jul/09	22/Jul/09	22/Jul/09	22/Jul/09	22/Jul/09
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stage					
1	flumioxazin	51	WDG	0.064	lb a/a	PO1,2	2.0	9.8	10.0	8.3	8.5
	pendimethalin	3.8	CS	2	lb a/a	PO1,2					
2	flumioxazin	51	WDG	0.064	lb a/a	PO1,2	8.0	10.0	10.0	9.0	10.0
	pendimethalin	3.3	EC	2	lb a/a	PO1,2					
3	flumioxazin	51	WDG	0.064	lb a/a	PO1,2	7.5	10.0	10.0	7.3	10.0
	dimethenamid-p	6	EC	0.98	lb a/a	PO1,2					
4	flumioxazin	51	WDG	0.064	lb a/a	PO1,2	7.8	10.0	10.0	8.8	10.0
	s-metolachlor	7.62	EC	1.3	lb a/a	PO1,2					
5	flumioxazin	51	WDG	0.064	lb a/a	PO1,2	1.8	9.8	9.8	6.8	9.3
6	flumioxazin	51	WDG	0.032	lb a/a	PO1,2	1.8	10.0	10.0	8.3	7.5
	pendimethalin	3.8	CS	2	lb a/a	PO1,2					
7	flumioxazin	51	WDG	0.032	lb a/a	PO1,2	7.4	10.0	10.0	9.5	9.8
	pendimethalin	3.3	EC	2	lb a/a	PO1,2					
8	flumioxazin	51	WDG	0.032	lb a/a	PO1,2	7.8	10.0	10.0	9.3	10.0
	dimethenamid-p	6	EC	0.98	lb a/a	PO1,2					
9	flumioxazin	51	WDG	0.032	lb a/a	PO1,2	7.6	10.0	10.0	7.5	10.0
	s-metolachlor	7.62	EC	1.3	lb a/a	PO1,2					
10	flumioxazin	51	WDG	0.032	lb a/a	PO1,2	2.3	9.5	10.0	8.0	7.8
11	flumioxazin	51	WDG	0	lb a/a		2.4	9.8	7.3	7.5	6.0
	pendimethalin	3.8	CS	2	lb a/a	PO1,2					
12	flumioxazin	51	WDG	0	lb a/a		1.9	10.0	8.8	8.3	7.5
	pendimethalin	3.3	EC	2	lb a/a	PO1,2					
13	flumioxazin	51	WDG	0	lb a/a		3.2	7.8	8.5	7.5	7.3
	dimethenamid-p	6	EC	0.98	lb a/a	PO1,2					
14	flumioxazin	51	WDG	0	lb a/a		3.3	5.8	5.0	8.3	4.3
	s-metolachlor	7.62	EC	1.3	lb a/a	PO1,2					
15	flumioxazin	51	WDG	0	lb a/a		2.9	1.0	1.5	1.0	1.0
LSD (P=.05)							1.55	1.45	1.60	1.72	1.46
Standard Deviation							1.09	1.01	1.12	1.20	1.02
CV							24.03	11.42	12.85	15.68	12.89

Postemergence Weed Control with Chateau in Onion – Muck Farm 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stage	RRPW Rating 1-10 22/Jul/09	YENS Rating 1-10 22/Jul/09	ONION Harvest KG/plot 12/Oct/09
1	flumioxazin	51	WDG	0.064	lb a/a	PO1,2	10.0	3.3	25.24
	pendimethalin	3.8	CS	2	lb a/a	PO1,2			
2	flumioxazin	51	WDG	0.064	lb a/a	PO1,2	10.0	6.8	5.53
	pendimethalin	3.3	EC	2	lb a/a	PO1,2			
3	flumioxazin	51	WDG	0.064	lb a/a	PO1,2	10.0	7.0	10.77
	dimethenamid-p	6	EC	0.98	lb a/a	PO1,2			
4	flumioxazin	51	WDG	0.064	lb a/a	PO1,2	10.0	7.3	9.57
	s-metolachlor	7.62	EC	1.3	lb a/a	PO1,2			
5	flumioxazin	51	WDG	0.064	lb a/a	PO1,2	10.0	3.3	22.11
6	flumioxazin	51	WDG	0.032	lb a/a	PO1,2	10.0	2.8	18.52
	pendimethalin	3.8	CS	2	lb a/a	PO1,2			
7	flumioxazin	51	WDG	0.032	lb a/a	PO1,2	10.0	7.8	7.27
	pendimethalin	3.3	EC	2	lb a/a	PO1,2			
8	flumioxazin	51	WDG	0.032	lb a/a	PO1,2	10.0	7.8	11.09
	dimethenamid-p	6	EC	0.98	lb a/a	PO1,2			
9	flumioxazin	51	WDG	0.032	lb a/a	PO1,2	10.0	7.0	9.16
	s-metolachlor	7.62	EC	1.3	lb a/a	PO1,2			
10	flumioxazin	51	WDG	0.032	lb a/a	PO1,2	10.0	2.8	21.87
11	flumioxazin	51	WDG	0	lb a/a		7.8	1.3	14.23
	pendimethalin	3.8	CS	2	lb a/a	PO1,2			
12	flumioxazin	51	WDG	0	lb a/a		7.5	1.3	24.36
	pendimethalin	3.3	EC	2	lb a/a	PO1,2			
13	flumioxazin	51	WDG	0	lb a/a		8.5	7.5	20.56
	dimethenamid-p	6	EC	0.98	lb a/a	PO1,2			
14	flumioxazin	51	WDG	0	lb a/a		6.5	5.5	15.00
	s-metolachlor	7.62	EC	1.3	lb a/a	PO1,2			
15	flumioxazin	51	WDG	0	lb a/a		1.0	1.0	10.58
LSD (P=.05)							1.45	1.27	7.117
Standard Deviation							1.01	0.89	4.980
CV							11.59	18.49	33.08

Postemergence Weed Control with Goaltender in Onion – Muck Farm 2009

Project Code: 112-09-05 **Location:** Laingsburg, MI

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Onion **Variety:** See notes
Planting Method: Seeded **Planting Date:** 5/13/09
Spacing: 0.75 IN **Row Spacing:** 16 IN
Tillage Type: Conventional **Study Design:** RCB **Replications:** 4
Plot Size: 5.5 ft wide x 25 ft long

Soil Type: Houghton Muck **OM:** 78.2% **pH:** 6.7
Sand: 3.4% **Silt:** 17.5% **Clay:** .9% **CEC:**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PO1	6/10/09	11:00 am	74/63	°F	Wet	4 SW	65	90% Cloudy	N
PO2	6/18/09	11:00 am	66/64	°F	Moist	1 S	57.6	20% Cloudy	N
PO3	7/8/09	1:00 pm	80/61	°F	Moist	2 S	40	80% Cloudy	N
PO4	7/14/09	3:00 pm	78/70	°F	Good	6 N	63	100%Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
6/10	ONION	3-4″	1 LF	
6/10	YENS = yellow nutsedge	3-4″		many
6/10	LATH = ladysthumb	1-3″		moderate
6/10	RRPW = redroot pigweed	0-2″		few
6/18	ONION	2-3″	2 LF	
6/18	YENS = yellow nutsedge	6-12″		many
6/18	LATH = ladysthumb	3-6″		moderate
6/18	RRPW = redroot pigweed	2-3″		Few
7/8	ONION	8-10″	3 LF	
7/8	YENS = yellow nutsedge	10-12″		many
7/14	ONION	8-12″	3-4 LF	
7/14	YENS = yellow nutsedge	1-3″		many
7/14	RRPW = redroot pigweed	2-6″		few
7/14	COPU = common purslane	2-6″		few

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. Three rows were 16 inches apart on a raised bed.
4. V1 East- Sherman, V2 Middle- Festival, V3 West- Santana. The 3 cultivars were combined for yield calculation.
5. Field was flooded twice during the season. Stands and yield reduced.
6. Yellow nutsedge was a major problem and had to be removed by hand.

Postemergence Weed Control with Goaltender in Onion – Muck Farm 2009

Dept. of Horticulture, MSU

Trial ID: 112-09-05 Study Director: Dr. Bernard Zandstra
Location: Muck Farm, Laingsburg Investigator: Rodney Tocco

Weed Code							ONION	LATH	RRPW	YENS	ONION
Crop Code											
Rating Data Type							Rating	Rating	Rating	Rating	Rating
Rating Unit							1-10	1-10	1-10	1-10	1-10
Rating Date							18/Jun/09	18/Jun/09	18/Jun/09	18/Jun/09	24/Jun/09
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stage					
1	oxyfluorfen	4	SC	0.031	lb a/a	PO1,2,3	1.2	5.3	9.8	2.0	1.0
2	oxyfluorfen	4	SC	0.063	lb a/a	PO1,2,3	1.6	6.8	9.5	2.0	1.7
3	oxyfluorfen	4	SC	0.125	lb a/a	PO1,2,3	2.4	8.0	10.0	2.8	3.0
4	oxyfluorfen	4	SC	0.188	lb a/a	PO1,2,3	2.7	8.8	10.0	3.0	3.5
5	oxyfluorfen	2	EC	0.031	lb a/a	PO1,2,3	1.8	7.0	9.8	2.0	2.7
6	oxyfluorfen	2	EC	0.063	lb a/a	PO1,2,3	2.5	8.0	10.0	2.0	2.7
7	oxyfluorfen	2	EC	0.125	lb a/a	PO1,2,3	3.1	9.0	10.0	3.0	4.5
8	oxyfluorfen	2	EC	0.188	lb a/a	PO1,2,3	3.7	9.8	10.0	3.0	4.5
9	oxyfluorfen	4	SC	0.031	lb a/a	PO2, 4	1.0	1.0	1.0	1.0	1.0
10	oxyfluorfen	4	SC	0.063	lb a/a	PO2, 4	1.0	1.0	1.0	1.0	2.5
11	oxyfluorfen	4	SC	0.125	lb a/a	PO2, 4	1.0	1.0	1.0	1.0	2.5
12	oxyfluorfen	4	SC	0.25	lb a/a	PO2, 4	1.0	1.0	1.0	1.0	3.5
13	oxyfluorfen	4	SC	0.188	lb a/a	PO2, 4	1.0	1.0	1.0	1.0	3.2
14	oxyfluorfen	2	EC	0.031	lb a/a	PO2, 4	1.0	1.0	1.0	1.0	2.0
15	oxyfluorfen	2	EC	0.063	lb a/a	PO2, 4	1.0	1.0	1.0	1.0	3.0
16	oxyfluorfen	2	EC	0.125	lb a/a	PO2, 4	1.0	1.0	1.0	1.0	4.0
17	oxyfluorfen	2	EC	0.188	lb a/a	PO2, 4	1.0	1.0	1.0	1.0	4.0
18	Handweeded						1.0	1.0	1.0	1.0	1.0
LSD (P=.05)							0.37	0.67	0.31	0.17	1.29
Standard Deviation							0.26	0.47	0.22	0.12	0.61
CV							16.43	11.79	4.38	7.13	21.95

Postemergence Weed Control with Goaltender in Onion – Muck Farm 2009

Dept. of Horticulture, MSU

Weed Code							LATH	RRPW			COLQ
Crop Code									ONION	ONION	
Rating Data Type							Rating	Rating	Rating	Rating	Rating
Rating Unit							1-10	1-10	1-10	1-10	1-10
Rating Date							24/Jun/09	24/Jun/09	14/Jul/09	22/Jul/09	22/Jul/09
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stage					
1	oxyfluorfen	4	SC	0.031	lb a/a	PO1,2,3	7.0	10.0	4.8	3.0	9.5
2	oxyfluorfen	4	SC	0.063	lb a/a	PO1,2,3	9.5	10.0	4.0	2.3	9.0
3	oxyfluorfen	4	SC	0.125	lb a/a	PO1,2,3	9.5	10.0	3.2	1.0	10.0
4	oxyfluorfen	4	SC	0.188	lb a/a	PO1,2,3	10.0	10.0	4.5	3.0	10.0
5	oxyfluorfen	2	EC	0.031	lb a/a	PO1,2,3	8.5	10.0	4.2	3.2	9.5
6	oxyfluorfen	2	EC	0.063	lb a/a	PO1,2,3	10.0	10.0	3.8	3.0	10.0
7	oxyfluorfen	2	EC	0.125	lb a/a	PO1,2,3	10.0	10.0	4.0	2.5	10.0
8	oxyfluorfen	2	EC	0.188	lb a/a	PO1,2,3	10.0	10.0	4.8	3.5	10.0
9	oxyfluorfen	4	SC	0.031	lb a/a	PO2, 4	4.5	9.5	5.2	3.2	8.0
10	oxyfluorfen	4	SC	0.063	lb a/a	PO2, 4	6.0	10.0	5.2	4.7	10.0
11	oxyfluorfen	4	SC	0.125	lb a/a	PO2, 4	6.0	10.0	5.0	2.7	8.5
12	oxyfluorfen	4	SC	0.25	lb a/a	PO2, 4	7.5	10.0	5.6	3.8	10.0
13	oxyfluorfen	4	SC	0.188	lb a/a	PO2, 4	7.0	10.0	4.4	4.0	9.5
14	oxyfluorfen	2	EC	0.031	lb a/a	PO2, 4	6.0	10.0	4.3	3.3	9.5
15	oxyfluorfen	2	EC	0.063	lb a/a	PO2, 4	7.0	10.0	5.3	4.3	10.0
16	oxyfluorfen	2	EC	0.125	lb a/a	PO2, 4	7.5	10.0	4.8	4.7	10.0
17	oxyfluorfen	2	EC	0.188	lb a/a	PO2, 4	7.0	10.0	4.6	3.8	10.0
18	Handweeded						1.0	1.0	5.3	4.0	1.0
LSD (P=.05)							1.75	0.36	1.28	2.17	1.55
Standard Deviation							0.82	0.17	0.91	1.03	0.73
CV							11.08	1.81	19.67	30.92	8.02

Postemergence Weed Control with Goaltender in Onion – Muck Farm 2009

Dept. of Horticulture, MSU

Weed Code							LATH	RRPW	
Crop Code									ONION
Rating Data Type							Rating	Rating	Harvest
Rating Unit							1-10	1-10	KG/plot
Rating Date							22/Jul/09	22/Jul/09	6/Oct/09
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Grow Stage			
1	oxyfluorfen	4	SC	0.031	lb a/a	PO1,2,3	3.5	8.5	4.74
2	oxyfluorfen	4	SC	0.063	lb a/a	PO1,2,3	4.5	9.0	9.51
3	oxyfluorfen	4	SC	0.125	lb a/a	PO1,2,3	6.0	10.0	14.58
4	oxyfluorfen	4	SC	0.188	lb a/a	PO1,2,3	10.0	10.0	10.34
5	oxyfluorfen	2	EC	0.031	lb a/a	PO1,2,3	8.0	8.5	6.00
6	oxyfluorfen	2	EC	0.063	lb a/a	PO1,2,3	8.0	10.0	8.79
7	oxyfluorfen	2	EC	0.125	lb a/a	PO1,2,3	9.0	10.0	8.76
8	oxyfluorfen	2	EC	0.188	lb a/a	PO1,2,3	10.0	10.0	7.00
9	oxyfluorfen	4	SC	0.031	lb a/a	PO2, 4	6.5	8.0	4.74
10	oxyfluorfen	4	SC	0.063	lb a/a	PO2, 4	7.5	8.5	5.77
11	oxyfluorfen	4	SC	0.125	lb a/a	PO2, 4	4.0	7.0	5.60
12	oxyfluorfen	4	SC	0.25	lb a/a	PO2, 4	6.5	10.0	5.64
13	oxyfluorfen	4	SC	0.188	lb a/a	PO2, 4	8.0	10.0	5.29
14	oxyfluorfen	2	EC	0.031	lb a/a	PO2, 4	5.5	10.0	8.96
15	oxyfluorfen	2	EC	0.063	lb a/a	PO2, 4	7.5	10.0	3.82
16	oxyfluorfen	2	EC	0.125	lb a/a	PO2, 4	10.0	10.0	5.39
17	oxyfluorfen	2	EC	0.188	lb a/a	PO2, 4	9.0	10.0	8.38
18	Handweeded						1.0	1.0	2.44
LSD (P=.05)							2.90	2.93	7.261
Standard Deviation							1.37	1.39	5.134
CV							19.88	15.58	73.5

Weed Control in Onion – Grant 2009

Project Code: WC 112-09-06 **Location: Brink Farm**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Onion **Variety: Prince**
Planting Method: seeded **Planting Date: 4/21/09**
Spacing: 1 inch **Row Spacing: 34 inch; 2 rows/plot**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.33 ft wide x 30 ft long

Soil Type: Adrian Muck **OM: 60.0%** **pH: 6.1**
Sand: 17.0% **Silt: 19.0%** **Clay: 4.0%** **CEC:**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PO1	6/16/09	2:15 pm	80/82	F	Dry	10 E	34	75% Cloudy	N
PO2	7/9/09	4:00 pm	80/74	F	Dry	3-5 SE	31	15% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
6/16	ONION	3-4″	2-3 LF	
6/16	COLQ = common lambsquarters	2-5″		Few
7/9	ONION	12-15″	6-7 LF	
7/9	COLQ = common lambsquarters	3-6″		Moderate
7/9	RRPW = redroot pigweed	4-6″		Few

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. The field was treated with 4 qt. Prowl H2O preemergence.

Weed Control in Onion – Grant 2009

Dept. of Horticulture, MSU

Trial ID: WC 112-09-06 Study Director: Dr. Bernard Zandstra
Location: Brink Farm Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage				
Pest Code								COLQ	RRPW	
Description							Onion			Onion
Rating Date							9/Jul/2009	9/Jul/2009	9/Jul/2009	22/Sep/2009
Rating Data Type							RATING	RATING	RATING	HARVEST
Rating Unit							1-10	1-10	1-10	KG
1	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, PO2	2.0	6.0	9.7	34.57
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, PO2				
	NIS	100	SL	0.25	% v/v	PO1, PO2				
2	oxyfluorfen	4	SC	0.125	lb ai/a	PO1, PO2	3.0	7.3	9.0	39.09
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, PO2				
	NIS	100	SL	0.25	% v/v	PO1, PO2				
3	oxyfluorfen	4	SC	0.25	lb ai/a	PO1, PO2	1.7	8.3	8.7	50.26
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, PO2				
	NIS	100	SL	0.25	% v/v	PO1, PO2				
4	oxyfluorfen	2	L	0.25	lb ai/a	PO1, PO2	2.3	8.7	10.0	38.76
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, PO2				
	NIS	100	SL	0.25	% v/v	PO1, PO2				
5	bentazon	4	L	1	lb ai/a	PO1, PO2	2.0	4.7	5.7	36.28
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, PO2				
6	ethofumesate	4	SC	1	lb ai/a	PO1, PO2	2.7	5.7	6.7	42.08
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, PO2				
7	fluroxypyr	1.5	L	0.063	lb ai/a	PO1, PO2	2.7	5.0	6.0	35.69
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, PO2				
8	bromoxynil	4	EC	0.125	lb ai/a	PO1, PO2	4.0	8.7	7.7	30.29
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, PO2				
LSD (P=.05)							1.88	2.06	1.83	23.080
Standard Deviation							1.07	1.18	1.04	13.178
CV							42.17	17.34	13.18	34.34

Weed Control in Onion – Hudsonville 2009

Project Code: WC 112-09-07 **Location: Schreur Farms**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Onion **Variety: Bradley**
Planting Method: seeded **Planting Date: 4/21/09**
Spacing: 1 inch **Row Spacing: 14 inch; 3 rows/plot**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 3.33 ft wide x 30 ft long

Soil Type: Carlisle Muck **OM: 68.0%** **pH: 6.2**
Sand: 9.0% **Silt: 21.0%** **Clay: 2.0%** **CEC:**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	5/6/09	11:15 am	66/58	F	Moist	6 S	52	90% Cloudy	N
PO1	6/10/09	2:30 pm	69/70	F	Moderate	4 SE	55	0% Cloudy	N
PO2	7/9/09	12:00 pm	78/70	F	Moderate	1-2 SE	42	20% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/6	ONION		Pre-emerge	
6/10	ONION	6-8″	3-4 LF	
6/10	HOWE = horseweed	3-5″		Few
6/10	MAYC = marsh yellowcress	5-6″		Many
6/10	PAWE = pineappleweed	2-4″		Few
6/10	RECL = red clover			
6/10	VIPW = virginia pepperweed	4-6″		Moderate
6/10	WHCL = white clover	1-3″		Few
7/9	ONION	12-18″	5-6 LF	
7/9	HOWE = horseweed	6-12″		Few
7/9	MAYC = marsh yellowcress	2-3′		Many
7/9	PAWE = pineappleweed			
7/9	VIPW = virginia pepperweed			

Notes and Comments
1. Sprays applied with 2 nozzle boom FF11002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. The field was flooded in late May, and growth delayed.

Weed Control in Onion – Hudsonville 2009

Dept. of Horticulture, MSU

Trial ID: WC 112-09-07 Study Director: Dr. Bernard Zandstra
Location: Schreur Farm Investigator: Rodney Tocco

Weed Code								HOWE	MAYC	PAWE
Crop Code							ONION			
Rating Data Type							RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10
Rating Date							28/May/2009	28/May/2009	28/May/2009	28/May/2009
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage				
1	pendimethalin	3.8	CS	2	lb ai/a	PREPO1,2	1.7	10.0	7.0	10.0
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2				
	flumioxazin	51	WDG	0.064	lb ai/a	PO1, 2				
2	pendimethalin	3.8	CS	2	lb ai/a	PRE	1.7	9.0	7.0	9.3
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2				
	s-metolachlor	7.62	EC	1.3	lb ai/a	PO1, 2				
	flumioxazin	51	WDG	0.064	lb ai/a	PO1, 2				
3	pendimethalin	3.8	CS	2	lb ai/a	PRE	1.7	9.3	7.3	9.0
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2				
	dimethenamid-p	6	EC	0.98	lb ai/a	PO1, 2				
	flumioxazin	51	WDG	0.064	lb ai/a	PO1, 2				
4	pendimethalin	3.8	CS	2	lb ai/a	PRE	1.3	9.0	6.3	9.7
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2				
	ethofumesate	4	SC	1	lb ai/a	PO1, 2				
5	pendimethalin	3.8	CS	2	lb ai/a	PRE	1.3	9.0	7.0	8.7
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2				
	fluroxypyr	1.5	L	0.063	lb ai/a	PO1, 2				
6	pendimethalin	3.8	CS	2	lb ai/a	PRE	1.0	8.0	6.7	8.3
	oxyfluorfen	2	L	0.063	lb ai/a	PO1, 2				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2				
	flumioxazin	51	WDG	0.064	lb ai/a	PO1, 2				
7	pendimethalin	3.8	CS	2	lb ai/a	PRE	1.7	8.0	6.3	7.7
	oxyfluorfen	2	L	0.063	lb ai/a	PO1, 2				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2				
	ethofumesate	4	SC	1	lb ai/a	PO1, 2				
8	pendimethalin	3.8	CS	2	lb ai/a	PRE	1.3	7.0	6.3	8.0
	oxyfluorfen	2	L	0.063	lb ai/a	PO1, 2				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2				
	NIS		L	0.25	% v/v	PO1, 2				
9	flumioxazin	51	WDG	0.016	lb ai/a	PREPO1,2	3.0	9.7	9.7	9.7
	pendimethalin	3.8	CS	1.9	lb ai/a	PREPO1,2				
10	flumioxazin	51	WDG	0.032	lb ai/a	PREPO1,2	3.7	10.0	9.7	9.7
	pendimethalin	3.8	CS	1.9	lb ai/a	PREPO1,2				
11	flumioxazin	51	WDG	0.064	lb ai/a	PREPO1,2	6.0	10.0	10.0	9.7
	pendimethalin	3.8	CS	1.9	lb ai/a	PREPO1,2				
12	pendimethalin	3.8	CS	1.9	lb ai/a	PREPO1,2	1.3	9.0	7.7	9.3
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2				
LSD (P=.05)							1.01	1.85	1.50	1.84
Standard Deviation							0.59	1.09	0.88	1.08
CV							27.8	12.12	11.65	11.93

Weed Control in Onion – Hudsonville 2009

Dept. of Horticulture, MSU

Weed Code							RECL		HOWE	MAYC
Crop Code								ONION		
Rating Data Type							RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10
Rating Date							28/May/2009	21/Jun/2009	21/Jun/2009	21/Jun/2009
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage				
1	pendimethalin	3.8	CS	2	lb ai/a	PREPO1,2	8.0	5.0	5.3	3.7
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2				
	flumioxazin	51	WDG	0.064	lb ai/a	PO1, 2				
2	pendimethalin	3.8	CS	2	lb ai/a	PRE	8.0	6.0	7.3	6.7
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2				
	s-metolachlor	7.62	EC	1.3	lb ai/a	PO1, 2				
	flumioxazin	51	WDG	0.064	lb ai/a	PO1, 2				
3	pendimethalin	3.8	CS	2	lb ai/a	PRE	8.0	6.3	8.0	6.7
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2				
	dimethenamid-p	6	EC	0.98	lb ai/a	PO1, 2				
	flumioxazin	51	WDG	0.064	lb ai/a	PO1, 2				
4	pendimethalin	3.8	CS	2	lb ai/a	PRE	7.3	3.7	7.0	2.7
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2				
	ethofumesate	4	SC	1	lb ai/a	PO1, 2				
5	pendimethalin	3.8	CS	2	lb ai/a	PRE	8.0	3.0	7.3	5.0
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2				
	fluroxypyr	1.5	L	0.063	lb ai/a	PO1, 2				
6	pendimethalin	3.8	CS	2	lb ai/a	PRE	8.3	3.7	4.7	3.0
	oxyfluorfen	2	L	0.063	lb ai/a	PO1, 2				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2				
	flumioxazin	51	WDG	0.064	lb ai/a	PO1, 2				
7	pendimethalin	3.8	CS	2	lb ai/a	PRE	7.0	2.0	7.0	2.0
	oxyfluorfen	2	L	0.063	lb ai/a	PO1, 2				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2				
	ethofumesate	4	SC	1	lb ai/a	PO1, 2				
8	pendimethalin	3.8	CS	2	lb ai/a	PRE	7.7	2.3	3.3	1.7
	oxyfluorfen	2	L	0.063	lb ai/a	PO1, 2				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2				
	NIS		L	0.25	% v/v	PO1, 2				
9	flumioxazin	51	WDG	0.016	lb ai/a	PREPO1,2	9.3	2.0	8.7	7.7
	pendimethalin	3.8	CS	1.9	lb ai/a	PREPO1,2				
10	flumioxazin	51	WDG	0.032	lb ai/a	PREPO1,2	9.7	3.0	9.0	8.3
	pendimethalin	3.8	CS	1.9	lb ai/a	PREPO1,2				
11	flumioxazin	51	WDG	0.064	lb ai/a	PREPO1,2	9.7	4.3	9.7	9.7
	pendimethalin	3.8	CS	1.9	lb ai/a	PREPO1,2				
12	pendimethalin	3.8	CS	1.9	lb ai/a	PREPO1,2	8.7	2.0	6.7	4.7
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2				
LSD (P=.05)							1.25	1.41	2.51	2.61
Standard Deviation							0.74	0.83	1.48	1.54
CV							8.87	23.08	21.14	30.0

Weed Control in Onion – Hudsonville 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	PAWE RATING 1-10 21/Jun/2009	ONION RATING 1-10 9/Jul/2009	MAYC RATING 1-10 9/Jul/2009	ONION RATING 1-10 11/Aug/2009	ONION HARVEST KG 17/Sep/2009
1	pendimethalin	3.8	CS	2	lb ai/a	PREPO1,2	6.0	4.0	4.7	5.0	30.90
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2					
	flumioxazin	51	WDG	0.064	lb ai/a	PO1, 2					
2	pendimethalin	3.8	CS	2	lb ai/a	PRE	8.0	4.3	6.0	3.3	36.09
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2					
	s-metolachlor	7.62	EC	1.3	lb ai/a	PO1, 2					
	flumioxazin	51	WDG	0.064	lb ai/a	PO1, 2					
3	pendimethalin	3.8	CS	2	lb ai/a	PRE	7.3	4.7	5.7	3.7	35.21
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2					
	dimethenamid-p	6	EC	0.98	lb ai/a	PO1, 2					
	flumioxazin	51	WDG	0.064	lb ai/a	PO1, 2					
4	pendimethalin	3.8	CS	2	lb ai/a	PRE	7.7	2.0	1.7	4.7	37.63
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2					
	ethofumesate	4	SC	1	lb ai/a	PO1, 2					
5	pendimethalin	3.8	CS	2	lb ai/a	PRE	7.0	2.0	4.7	4.0	51.97
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2					
	fluroxypyr	1.5	L	0.063	lb ai/a	PO1, 2					
6	pendimethalin	3.8	CS	2	lb ai/a	PRE	6.3	3.3	3.0	6.0	22.23
	oxyfluorfen	2	L	0.063	lb ai/a	PO1, 2					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2					
	flumioxazin	51	WDG	0.064	lb ai/a	PO1, 2					
7	pendimethalin	3.8	CS	2	lb ai/a	PRE	5.0	2.0	1.7	5.7	33.15
	oxyfluorfen	2	L	0.063	lb ai/a	PO1, 2					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2					
	ethofumesate	4	SC	1	lb ai/a	PO1, 2					
8	pendimethalin	3.8	CS	2	lb ai/a	PRE	3.7	2.3	1.3	7.3	14.06
	oxyfluorfen	2	L	0.063	lb ai/a	PO1, 2					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2					
	NIS		L	0.25	% v/v	PO1, 2					
9	flumioxazin	51	WDG	0.016	lb ai/a	PREPO1,2	8.7	1.0	6.0	3.0	61.08
	pendimethalin	3.8	CS	1.9	lb ai/a	PREPO1,2					
10	flumioxazin	51	WDG	0.032	lb ai/a	PREPO1,2	8.7	2.0	7.3	1.3	61.22
	pendimethalin	3.8	CS	1.9	lb ai/a	PREPO1,2					
11	flumioxazin	51	WDG	0.064	lb ai/a	PREPO1,2	9.3	2.7	8.7	2.0	57.47
	pendimethalin	3.8	CS	1.9	lb ai/a	PREPO1,2					
12	pendimethalin	3.8	CS	1.9	lb ai/a	PREPO1,2	7.7	2.0	3.3	3.3	57.58
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1, 2					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1, 2					
LSD (P=.05)							3.58	1.90	3.40	2.19	22.279
Standard Deviation							2.11	1.12	2.01	1.30	13.156
CV							29.72	41.7	44.65	31.52	31.67

Weed Control in Green Onion and Leek – Muck Farm 2009

Project Code: WC 112-09-09 **Location: Laingsburg, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Green Onion, Leek **Variety: Long White Bunching, American Flag**
Planting Method: seeded **Planting Date: 4/30/09**
Spacing: 1 inch **Row Spacing: 16 inch; 1 row of each crop/plot**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.33 ft wide x 16.7 ft long

Soil Type: Houghton Muck **OM: 78.4%** **pH: 6.9**
Sand: 2.6% **Silt: 17.8%** **Clay: 1.2%** **CEC:**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	5/15/09	12:30 pm	66/55	F	Wet	5-6 S	59	100% Cloudy	N
PO1	7/6/09	10:30 am	78/65	F	Moderate	2-4 NW	55	50% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
7/6	GREEN ONION, LEEK		2-4, 2-3 Leaf	
7/6	COLQ = common lambsquarters	2-6″		Many
7/6	COPU = common purslane	2-6″		Many
7/6	LATH = ladysthumb	2-6″		Many
7/6	SMCG = smooth crabgrass	3-6″		Many
7/6	YENS = yellow nutsedge	6-18″		Many

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. Chives were also planted, but they did not germinate.
4. Experiment suffered severe flooding twice during season. Growth was stunted.

Weed Control in Green Onion and Leek – Muck Farm 2009

Dept. of Horticulture, MSU

Trial ID: WC 112-09-09 Study Director: Dr. Bernard Zandstra
Location: Muck Farm, Laingsburg Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code										LATH	YENS
Description							Tok Lng Wht	Wht Lisb	Leek		
Rating Date							15/Jun/09	15/Jun/09	15/Jun/09	15/Jun/09	15/Jun/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	Untreated						1.0	1.0	1.0	1.0	1.0
2	pendimethalin	3.8	CS	1	lb ai/a	PRE	1.0	1.0	1.7	3.7	2.3
3	pendimethalin	3.8	CS	2	lb ai/a	PRE	2.3	1.7	1.7	6.7	2.3
4	pendimethalin	3.8	CS	4	lb ai/a	PRE	2.7	2.7	3.3	8.7	2.3
5	pendimethalin	3.8	CS	2	lb ai/a	PRE	1.3	1.7	2.3	6.7	2.3
	pendimethalin	3.8	CS	2	lb ai/a	PO1					
6	propachlor	4	F	4	lb ai/a	PRE	1.0	1.0	1.0	5.7	6.7
	pendimethalin	3.8	CS	1	lb ai/a	PO1					
7	propachlor	4	F	4	lb ai/a	PRE	1.0	1.0	1.7	5.3	7.0
	pendimethalin	3.8	CS	2	lb ai/a	PO1					
8	propachlor	4	F	4	lb ai/a	PRE	1.0	1.0	2.0	6.0	6.0
	pendimethalin	3.8	CS	4	lb ai/a	PO1					
9	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	2.7	3.0	3.3	5.0	7.0
10	flumioxazin	51	WDG	0.064	lb ai/a	PRE	1.0	1.3	2.7	6.3	2.0
11	dimethenamid-p	6	EC	0.98	lb ai/a	PRE	3.0	2.7	3.0	5.3	6.7
12	propachlor	4	F	4	lb ai/a	PRE	1.0	1.0	1.3	5.3	5.7
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
13	propachlor	4	F	4	lb ai/a	PRE	1.0	1.3	1.3	4.7	6.3
	pendimethalin	3.8	CS	1.9	lb ai/a	PO1					
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
14	propachlor	4	F	4	lb ai/a	PRE	1.0	1.0	2.3	5.0	5.0
	flumioxazin	51	WDG	0.064	lb ai/a	PO1					
15	Untreated					PRE	1.0	1.0	1.0	1.0	1.0
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
LSD (P=.05)							0.50	0.72	0.94	1.42	1.71
Standard Deviation							0.30	0.43	0.56	0.85	1.02
CV							20.51	28.82	28.27	16.64	24.04

Weed Control in Green Onion and Leek – Muck Farm 2009

Dept. of Horticulture, MSU

Pest Code							COPU	RRPW			LACG
Description									Grn On	Leek	
Rating Date							15/Jun/09	15/Jun/09	6/Jul/09	6/Jul/09	6/Jul/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	Untreated						1.0	1.0	1.0	1.0	1.0
2	pendimethalin	3.8	CS	1	lb ai/a	PRE	3.7	4.3	1.0	2.0	4.0
3	pendimethalin	3.8	CS	2	lb ai/a	PRE	6.7	7.0	1.0	2.0	3.3
4	pendimethalin	3.8	CS	4	lb ai/a	PRE	10.0	9.0	1.0	1.7	8.7
5	pendimethalin	3.8	CS	2	lb ai/a	PRE	6.7	6.3	1.0	3.7	3.0
	pendimethalin	3.8	CS	2	lb ai/a	PO1					
6	propachlor	4	F	4	lb ai/a	PRE	9.0	9.0	1.0	1.3	9.0
	pendimethalin	3.8	CS	1	lb ai/a	PO1					
7	propachlor	4	F	4	lb ai/a	PRE	9.0	10.0	2.0	2.3	9.3
	pendimethalin	3.8	CS	2	lb ai/a	PO1					
8	propachlor	4	F	4	lb ai/a	PRE	9.0	8.3	1.0	3.0	8.3
	pendimethalin	3.8	CS	4	lb ai/a	PO1					
9	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	7.3	9.3	1.0	4.7	10.0
10	flumioxazin	51	WDG	0.064	lb ai/a	PRE	2.0	8.0	1.3	3.0	6.0
11	dimethenamid-p	6	EC	0.98	lb ai/a	PRE	9.3	9.7	1.0	1.3	9.0
12	propachlor	4	F	4	lb ai/a	PRE	9.0	9.0	1.0	5.3	9.0
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
13	propachlor	4	F	4	lb ai/a	PRE	8.3	9.0	1.0	5.0	9.0
	pendimethalin	3.8	CS	1.9	lb ai/a	PO1					
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
14	propachlor	4	F	4	lb ai/a	PRE	9.0	8.0	2.0	4.0	9.3
	flumioxazin	51	WDG	0.064	lb ai/a	PO1					
15	Untreated					PRE	1.0	1.0	1.0	1.0	1.0
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
LSD (P=.05)							1.11	1.33	0.68	1.86	1.74
Standard Deviation							0.66	0.79	0.41	1.11	1.04
CV							9.83	10.91	35.16	40.28	15.63

Weed Control in Green Onion and Leek – Muck Farm 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	YENS 6/Jul/09 RATING 1-10	COPU 6/Jul/09 RATING 1-10	LATH 6/Jul/09 RATING 1-10	Tok Lng Wht 25/Aug/09 HARVEST KG	Wht Lisb 25/Aug/09 HARVEST KG	Leek 13/Oct/09 HARVEST KG
1	Untreated						3.3	1.0	4.0	0.67	0.77	0.90
2	pendimethalin	3.8	CS	1	lb ai/a	PRE	2.7	1.0	7.0	1.04	1.06	1.14
3	pendimethalin	3.8	CS	2	lb ai/a	PRE	4.3	2.7	5.0	0.96	1.24	1.18
4	pendimethalin	3.8	CS	4	lb ai/a	PRE	5.7	7.3	8.7	1.26	1.90	1.72
5	pendimethalin	3.8	CS	2	lb ai/a	PRE	6.0	2.7	6.7	1.52	1.94	1.71
	pendimethalin	3.8	CS	2	lb ai/a	PO1						
6	propachlor	4	F	4	lb ai/a	PRE	3.3	2.7	7.0	1.15	2.07	1.76
	pendimethalin	3.8	CS	1	lb ai/a	PO1						
7	propachlor	4	F	4	lb ai/a	PRE	4.7	2.7	9.0	1.32	2.85	2.10
	pendimethalin	3.8	CS	2	lb ai/a	PO1						
8	propachlor	4	F	4	lb ai/a	PRE	3.0	2.7	9.0	1.27	1.82	1.51
	pendimethalin	3.8	CS	4	lb ai/a	PO1						
9	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	9.7	1.7	8.0	1.24	1.87	2.16
10	flumioxazin	51	WDG	0.064	lb ai/a	PRE	4.7	3.0	9.3	1.08	1.57	1.58
11	dimethenamid-p	6	EC	0.98	lb ai/a	PRE	9.0	5.3	8.7	1.10	2.10	2.16
12	propachlor	4	F	4	lb ai/a	PRE	1.0	5.0	1.3	0.75	0.83	0.95
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1						
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1						
13	propachlor	4	F	4	lb ai/a	PRE	1.0	2.3	1.0	0.75	0.82	1.12
	pendimethalin	3.8	CS	1.9	lb ai/a	PO1						
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1						
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1						
14	propachlor	4	F	4	lb ai/a	PRE	1.0	2.0	1.0	0.70	0.79	1.21
	flumioxazin	51	WDG	0.064	lb ai/a	PO1						
15	Untreated					PRE	1.0	1.0	1.0	0.50	0.38	0.60
	oxyfluorfen	4	SC	0.063	lb ai/a	PO1						
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1						
LSD (P=.05)							2.44	2.37	2.97	0.443	0.700	0.796
Standard Deviation							1.46	1.42	1.77	0.265	0.419	0.476
CV							36.22	49.45	30.7	25.95	28.53	32.74

Weed Control in Banana and Jalapeno Pepper – HTRC 2008

Project Code: WC 101-09-02 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Sweet Banana,Cherry Sweet **Variety: Sweet Banana, Cherry Sweet**
Planting Method: Transplant **Planting Date: 5/18/09**
Spacing: 22 inch **Row Spacing: 36 inch; 1 row of each type/plot**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 16 ft wide x 50 ft long

Soil Type: Marlette Fine Sandy Loam **OM: 3.1%** **pH: 5.3**
Sand: 61.1% **Silt: 25.5%** **Clay: 13.4%** **CEC: 13.8**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRT	5/21/09	10:30 am	77/63	F	Wet	7-8 W	34	0% Cloudy	N
POT	5/22/09	11:28 am	65/65	F	Medium	5 E	43	60% Cloudy	N
POTDIR	5/22/09	11:28 am	65/65	F	Medium	5 E	43	60% Cloudy	N
PO1	6/15/09	11:00 am	77/72	F	Dry	2-4 E	56	5% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/22	BANANA PEPPER	6-8″		
5/22	CHERRY PEPPER	6-8″		
6/23	BANANA PEPPER	6-8″		
6/23	CHERRY PEPPER	6-8″		
6/15	BYGR = barnyardgrass	8-11″		Moderate
6/15	CORW = common ragweed	2-4″		Many
6/15	LATH = ladysthumb	2-4″		Moderate
6/15	WIBW = wild buckwheat	2-3″		Few

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.

Weed Control in Banana and Jalapeno Pepper – HTRC 2008

Dept. of Horticulture, MSU

Trial ID: WC 101-09-02 Study Director: Dr. Bernard Zandstra
Location: HTRC Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Banana	Cherry Pepper	BYGR	CORW	LATH
Pest Code									BYGR	CORW	LATH
Description							Banana	Cherry Pepper			
Rating Date							15/Jun/2009	15/Jun/2009	15/Jun/2009	15/Jun/2009	15/Jun/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	s-metolachlor	7.62	EC	0.95	lb ai/a	PRT	1.0	1.0	10.0	2.7	8.0
2	s-metolachlor	7.62	EC	1.9	lb ai/a	PRT	2.0	2.0	10.0	4.3	9.0
3	s-metolachlor	7.62	EC	0.95	lb ai/a	POT	1.0	1.7	10.0	4.3	9.3
4	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	2.0	1.7	10.0	5.3	10.0
5	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	1.3	1.3	9.3	3.3	8.3
6	pendimethalin	3.8	CS	1.4	lb ai/a	POT	1.0	1.0	10.0	1.3	6.3
7	clomazone	3	ME	1	lb ai/a	PRT	1.0	1.7	10.0	9.3	10.0
8	fomesafen	2	EC	0.5	lb ai/a	PRT	1.7	1.3	9.3	9.3	9.7
9	flumioxazin	51	WDG	0.096	lb ai/a	POTDIR	5.7	5.3	9.7	9.7	10.0
10	flumioxazin	51	WDG	0.192	lb ai/a	POTDIR	7.0	6.3	9.7	10.0	10.0
11	halosulfuron	75	WG	0.047	lb ai/a	POTDIR	4.0	4.3	6.7	9.3	10.0
12	Untreated					POT	1.0	1.0	1.0	1.0	1.0
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
13	Untreated					POT	1.3	1.3	1.0	2.3	3.3
	rimsulfuron	25	DF	0.031	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
14	Untreated						1.0	1.0	1.0	1.0	1.0
LSD (P=.05)							1.46	1.58	1.44	2.41	2.48
Standard Deviation							0.87	0.94	0.85	1.44	1.48
CV							39.28	42.48	11.12	27.4	19.49

Weed Control in Banana and Jalapeno Pepper – HTRC 2008

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	WIBW	Banana Pepper	Cherry Pepper	Banana Pepper
Pest Code										
Description								Banana Pepper	Cherry Pepper	Banana Pepper
Rating Date							15/Jun/2009	22/Jun/2009	22/Jun/2009	22/Jun/2009
Rating Data Type							RATING	PLANT COUNT	PLANT COUNT	RATING
Rating Unit							1-10	#	#	1-10
1	s-metolachlor	7.62	EC	0.95	lb ai/a	PRT	8.3	17.3	18.7	1.7
2	s-metolachlor	7.62	EC	1.9	lb ai/a	PRT	9.7	19.0	18.3	3.0
3	s-metolachlor	7.62	EC	0.95	lb ai/a	POT	9.3	16.3	17.7	4.3
4	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	8.7	17.3	18.7	2.0
5	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	10.0	16.0	17.3	2.0
6	pendimethalin	3.8	CS	1.4	lb ai/a	POT	10.0	17.7	17.7	2.3
7	clomazone	3	ME	1	lb ai/a	PRT	10.0	18.0	17.3	1.7
8	fomesafen	2	EC	0.5	lb ai/a	PRT	10.0	18.3	18.0	3.3
9	flumioxazin	51	WDG	0.096	lb ai/a	POTDIR	10.0	10.0	11.3	9.0
10	flumioxazin	51	WDG	0.192	lb ai/a	POTDIR	10.0	12.0	11.3	9.3
11	halosulfuron	75	WG	0.047	lb ai/a	POTDIR	9.7	18.3	16.3	5.7
12	Untreated					POT	1.0	17.3	18.7	2.0
	halosulfuron	75	WG	0.023	lb ai/a	PO1				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1				
13	Untreated					POT	1.0	18.3	18.7	4.0
	rimsulfuron	25	DF	0.031	lb ai/a	PO1				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1				
14	Untreated						1.0	17.0	18.7	1.0
LSD (P=.05)							1.14	4.24	3.67	2.46
Standard Deviation							0.68	2.53	2.18	1.46
CV							8.75	15.19	12.81	39.94

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Cherry Pepper	BYGR	COLQ	CORW	LATH
Pest Code											
Description							Cherry Pepper				
Rating Date							22/Jun/2009	22/Jun/2009	22/Jun/2009	22/Jun/2009	22/Jun/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	s-metolachlor	7.62	EC	0.95	lb ai/a	PRT	2.7	10.0	8.7	1.3	8.3
2	s-metolachlor	7.62	EC	1.9	lb ai/a	PRT	4.3	10.0	10.0	2.7	9.3
3	s-metolachlor	7.62	EC	0.95	lb ai/a	POT	3.0	10.0	10.0	3.7	9.3
4	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	2.3	10.0	9.0	3.7	10.0
5	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	2.0	7.3	10.0	1.3	7.7
6	pendimethalin	3.8	CS	1.4	lb ai/a	POT	2.3	10.0	10.0	1.0	10.0
7	clomazone	3	ME	1	lb ai/a	PRT	2.3	10.0	10.0	9.3	10.0
8	fomesafen	2	EC	0.5	lb ai/a	PRT	3.0	6.3	10.0	10.0	9.7
9	flumioxazin	51	WDG	0.096	lb ai/a	POTDIR	9.0	8.7	10.0	9.7	9.7
10	flumioxazin	51	WDG	0.192	lb ai/a	POTDIR	9.3	9.0	10.0	9.7	10.0
11	halosulfuron	75	WG	0.047	lb ai/a	POTDIR	8.0	1.0	8.3	8.7	10.0
12	Untreated					POT	3.0	3.0	7.3	7.0	9.0
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
13	Untreated					POT	4.3	9.7	9.0	7.0	9.7
	rimsulfuron	25	DF	0.031	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
14	Untreated						1.0	5.7	9.0	6.0	7.7
LSD (P=.05)							1.66	2.59	0.78	3.51	1.87
Standard Deviation							0.99	1.54	0.47	2.09	1.12
CV							24.39	19.54	4.98	36.12	12.0

Weed Control in Banana and Jalapeno Pepper – HTRC 2008

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Banana Pepper 10/Aug/2009 WEIGHT KG	Banana Pepper 3/Sep/2009 WEIGHT KG	Banana Pepper 29/Sep/2009 WEIGHT KG	Banana Pepper 30/Sep/2009 WEIGHT KG
1	s-metolachlor	7.62	EC	0.95	lb ai/a	PRT	2.23	3.19	3.54	1.25
2	s-metolachlor	7.62	EC	1.9	lb ai/a	PRT	2.13	2.93	5.36	1.22
3	s-metolachlor	7.62	EC	0.95	lb ai/a	POT	1.26	2.04	1.89	1.25
4	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	3.07	3.38	3.87	2.15
5	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	3.03	4.29	3.24	4.25
6	pendimethalin	3.8	CS	1.4	lb ai/a	POT	0.79	3.31	6.61	4.19
7	clomazone	3	ME	1	lb ai/a	PRT	5.16	7.77	7.45	2.91
8	fomesafen	2	EC	0.5	lb ai/a	PRT	2.85	5.08	5.85	1.68
9	flumioxazin	51	WDG	0.096	lb ai/a	POTDIR	0.11	0.89	1.64	0.69
10	flumioxazin	51	WDG	0.192	lb ai/a	POTDIR	0.33	0.73	2.25	0.42
11	halosulfuron	75	WG	0.047	lb ai/a	POTDIR	0.54	0.69	2.15	0.49
12	Untreated					POT	3.49	2.77	3.99	1.11
	halosulfuron	75	WG	0.023	lb ai/a	PO1				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1				
13	Untreated					POT	2.58	3.50	4.23	3.27
	rimsulfuron	25	DF	0.031	lb ai/a	PO1				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1				
14	Untreated						3.93	2.08	4.96	1.48
LSD (P=.05)							2.216	1.822	3.748	1.946
Standard Deviation							1.320	1.085	2.233	1.159
CV							58.69	35.62	54.82	61.55

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Banana Pepper TOTAL WT KG	Cherry Pepper 10/Sep/2009 WEIGHT KG	Cherry Pepper 30/Sep/2009 WEIGHT KG	Cherry Pepper TOTAL WT KG
1	s-metolachlor	7.62	EC	0.95	lb ai/a	PRT	10.22	2.32	2.93	5.25
2	s-metolachlor	7.62	EC	1.9	lb ai/a	PRT	11.64	3.33	3.09	6.41
3	s-metolachlor	7.62	EC	0.95	lb ai/a	POT	6.44	3.95	1.63	5.58
4	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	12.47	3.35	2.78	6.13
5	pendimethalin	3.8	CS	1.4	lb ai/a	PRT	14.81	4.19	2.70	6.89
6	pendimethalin	3.8	CS	1.4	lb ai/a	POT	14.90	3.01	6.33	9.34
7	clomazone	3	ME	1	lb ai/a	PRT	23.28	5.47	4.01	9.48
8	fomesafen	2	EC	0.5	lb ai/a	PRT	15.45	4.57	3.25	7.82
9	flumioxazin	51	WDG	0.096	lb ai/a	POTDIR	3.33	1.94	1.94	3.88
10	flumioxazin	51	WDG	0.192	lb ai/a	POTDIR	3.74	0.95	1.32	2.27
11	halosulfuron	75	WG	0.047	lb ai/a	POTDIR	3.86	0.53	0.42	0.95
12	Untreated					POT	11.35	4.57	1.73	6.30
	halosulfuron	75	WG	0.023	lb ai/a	PO1				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1				
13	Untreated					POT	13.58	4.28	2.87	7.15
	rimsulfuron	25	DF	0.031	lb ai/a	PO1				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1				
14	Untreated						12.45	2.98	4.90	7.88
LSD (P=.05)							6.598	2.846	3.643	4.045
Standard Deviation							3.930	1.696	2.170	2.410
CV							34.93	52.25	76.13	39.53

Weed Control in Bell Pepper and Tomato – HTRC 2009

Project Code: WC 101-09-01 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Bell Pepper, Tomato **Variety: King Arthur, Sunbrite**
Planting Method: Transplant **Planting Date: 5/18/09**
Spacing: 22 inches in row **Row Spacing: 36 inches**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.33 ft wide x 30 ft long

Soil Type: Marlette Fine Sandy Loam **OM: 1.9%** **pH: 5.4**
Sand: 59.5% **Silt: 27.1%** **Clay: 13.4%** **CEC: 9.0**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRT	5/18/09	2:00 pm	67/64	F	Damp	3-5 SW	27	0% Cloudy	N
POT	5/18/09	4:00 pm	66/69	F	Damp	5-7 S	28	0% Cloudy	N
PO1	6/15/09	11:25 am	78/72	F	Dry	2-4 E	56.8	5% Cloudy	N
POSDIR	6/15/09	11:25 am	78/72	F	Dry	2-4 E	56.8	5% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
5/18	TOMATO			
5/18	BELL PEPPER			
6/15	BYGR = barnyardgrass	8-10″		Many
6/15	CORW = common ragweed	2-4″		Many
6/15	LATH = ladysthumb	2-3″		Many
6/15	WIBW = wild buckwheat	2-4″		Moderate

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.

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Trial ID: WC 101-09-01 Study Director: Dr. Bernard Zandstra
Location: HTRC, East Lansing Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Pepper	Tomato	BYGR	CORW
Pest Code									BYGR	CORW
Description							Pepper	Tomato		
Rating Date							15/Jun/2009	15/Jun/2009	15/Jun/2009	15/Jun/2009
Rating Data Type							RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10
1	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	1.7	1.7	7.0	6.3
2	fomesafen	2	EC	0.5	lb ai/a	PRT	1.3	1.7	10.0	10.0
3	napropamide	50	DF	2	lb ai/a	POT	2.3	1.7	9.7	5.3
	s-metolachlor	7.62	EC	1.9	lb ai/a	PO1				
4	napropamide-UV	50	DF	2	lb ai/a	POT	1.0	1.0	10.0	7.0
5	napropamide	50	DF	2	lb ai/a	POT	1.0	1.0	9.7	4.7
6	pendimethalin	3.8	CS	0.95	lb ai/a	PRT	1.0	1.0	10.0	1.3
7	pendimethalin	3.8	CS	0.95	lb ai/a	POT	1.3	1.7	9.3	2.0
8	pendimethalin	3.8	CS	0.95	lb ai/a	PRT	2.7	1.3	10.0	8.0
	metribuzin	75	DF	0.188	lb ai/a	PRT				
9	pendimethalin	3.8	CS	0.95	lb ai/a	POT	8.7	3.0	10.0	8.3
	metribuzin	75	DF	0.188	lb ai/a	POT				
10	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	3.0	3.3	10.0	9.7
	clomazone	3	ME	0.5	lb ai/a	POT				
11	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	2.3	3.0	10.0	6.7
	rimsulfuron	25	DF	0.031	lb ai/a	PO1				
12	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	2.3	3.7	10.0	6.7
	halosulfuron	75	WG	0.023	lb ai/a	PO1				
13	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	2.0	1.7	10.0	6.7
	metribuzin	75	DF	0.25	lb ai/a	PO1				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1				
	NIS	100	SL	0.25	% v/v	PO1				
14	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	2.0	2.7	10.0	6.0
	pyraflufen	0.208	EC	0.00163	lb ai/a	POSDIR				
	NIS	100	SL	0.25	% v/v	POSDIR				
15	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	2.0	2.7	10.0	6.0
	pyraflufen	0.208	EC	0.00163	lb ai/a	POSDIR				
	clethodim	0.97	EC	0.09	lb ai/a	POSDIR				
	NIS	100	SL	0.25	% v/v	POSDIR				
16	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	2.0	1.7	10.0	7.0
	pyraflufen	0.208	EC	0.00163	lb ai/a	POSDIR				
	halosulfuron	75	WG	0.023	lb ai/a	POSDIR				
	clethodim	0.97	EC	0.09	lb ai/a	POSDIR				
	NIS	100	SL	0.25	% v/v	POSDIR				
17	Untreated						1.0	1.0	1.0	1.0
LSD (P=.05)							1.13	0.88	2.12	1.86
Standard Deviation							0.68	0.53	1.27	1.12
CV							30.6	26.52	13.83	18.48

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Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	LATH	WIBW	Bell Pepper	Tomato
Pest Code							LATH	WIBW		
Description									Bell Pepper	Tomato
Rating Date							15/Jun/2009	15/Jun/2009	22/Jun/2009	22/Jun/2009
Rating Data Type							RATING	RATING	PlantCounts	PlantCounts
Rating Unit							1-10	1-10	#	#
1	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	8.7	9.0	16.7	16.0
2	fomesafen	2	EC	0.5	lb ai/a	PRT	10.0	10.0	17.7	17.3
3	napropamide	50	DF	2	lb ai/a	POT	6.3	8.3	16.0	16.7
	s-metolachlor	7.62	EC	1.9	lb ai/a	PO1				
4	napropamide-UV	50	DF	2	lb ai/a	POT	6.0	9.0	16.3	18.3
5	napropamide	50	DF	2	lb ai/a	POT	8.3	7.7	16.3	18.0
6	pendimethalin	3.8	CS	0.95	lb ai/a	PRT	5.8	10.0	17.3	17.0
7	pendimethalin	3.8	CS	0.95	lb ai/a	POT	4.0	8.3	15.3	15.0
8	pendimethalin	3.8	CS	0.95	lb ai/a	PRT	9.7	10.0	15.0	16.7
	metribuzin	75	DF	0.188	lb ai/a	PRT				
9	pendimethalin	3.8	CS	0.95	lb ai/a	POT	10.0	10.0	3.3	14.0
	metribuzin	75	DF	0.188	lb ai/a	POT				
10	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	9.7	10.0	14.3	16.3
	clomazone	3	ME	0.5	lb ai/a	POT				
11	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	9.3	10.0	16.7	15.0
	rimsulfuron	25	DF	0.031	lb ai/a	PO1				
12	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	9.3	9.7	16.7	15.0
	halosulfuron	75	WG	0.023	lb ai/a	PO1				
13	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	8.7	8.0	16.3	17.3
	metribuzin	75	DF	0.25	lb ai/a	PO1				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1				
	NIS	100	SL	0.25	% v/v	PO1				
14	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	8.3	10.0	16.3	17.7
	pyraflufen	0.208	EC	0.00163	lb ai/a	POSDIR				
	NIS	100	SL	0.25	% v/v	POSDIR				
15	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	8.3	10.0	16.3	15.7
	pyraflufen	0.208	EC	0.00163	lb ai/a	POSDIR				
	clethodim	0.97	EC	0.09	lb ai/a	POSDIR				
	NIS	100	SL	0.25	% v/v	POSDIR				
16	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	9.3	10.0	16.3	17.0
	pyraflufen	0.208	EC	0.00163	lb ai/a	POSDIR				
	halosulfuron	75	WG	0.023	lb ai/a	POSDIR				
	clethodim	0.97	EC	0.09	lb ai/a	POSDIR				
	NIS	100	SL	0.25	% v/v	POSDIR				
17	Untreated						4.0	1.0	17.3	16.3
LSD (P=.05)							4.28	2.29	2.47	2.45
Standard Deviation							2.57	1.38	1.48	1.47
CV							32.18	15.49	9.53	8.95

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Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage				
Pest Code									BYGR	COLQ
Description							Bell Pepper	Tomato		
Rating Date							22/Jun/2009	22/Jun/2009	22/Jun/2009	22/Jun/2009
Rating Data Type							RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10
1	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	3.0	5.3	10.0	9.3
2	fomesafen	2	EC	0.5	lb ai/a	PRT	1.3	2.0	8.0	10.0
3	napropamide	50	DF	2	lb ai/a	POT	3.3	2.7	8.7	9.0
	s-metolachlor	7.62	EC	1.9	lb ai/a	PO1				
4	napropamide-UV	50	DF	2	lb ai/a	POT	1.3	1.7	9.7	8.3
5	napropamide	50	DF	2	lb ai/a	POT	3.3	1.0	10.0	7.0
6	pendimethalin	3.8	CS	0.95	lb ai/a	PRT	3.0	2.3	9.0	9.3
7	pendimethalin	3.8	CS	0.95	lb ai/a	POT	4.0	6.7	10.0	10.0
8	pendimethalin	3.8	CS	0.95	lb ai/a	PRT	7.3	3.3	10.0	9.0
	metribuzin	75	DF	0.188	lb ai/a	PRT				
9	pendimethalin	3.8	CS	0.95	lb ai/a	POT	9.3	6.3	9.7	10.0
	metribuzin	75	DF	0.188	lb ai/a	POT				
10	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	7.0	8.0	10.0	10.0
	clomazone	3	ME	0.5	lb ai/a	POT				
11	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	5.7	8.3	10.0	10.0
	rimsulfuron	25	DF	0.031	lb ai/a	PO1				
12	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	5.3	8.0	10.0	10.0
	halosulfuron	75	WG	0.023	lb ai/a	PO1				
13	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	7.0	6.7	9.7	10.0
	metribuzin	75	DF	0.25	lb ai/a	PO1				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1				
	NIS	100	SL	0.25	% v/v	PO1				
14	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	4.3	7.3	10.0	10.0
	pyraflufen	0.208	EC	0.00163	lb ai/a	POSDIR				
	NIS	100	SL	0.25	% v/v	POSDIR				
15	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	5.0	7.0	10.0	10.0
	pyraflufen	0.208	EC	0.00163	lb ai/a	POSDIR				
	clethodim	0.97	EC	0.09	lb ai/a	POSDIR				
	NIS	100	SL	0.25	% v/v	POSDIR				
16	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	5.7	7.3	10.0	10.0
	pyraflufen	0.208	EC	0.00163	lb ai/a	POSDIR				
	halosulfuron	75	WG	0.023	lb ai/a	POSDIR				
	clethodim	0.97	EC	0.09	lb ai/a	POSDIR				
	NIS	100	SL	0.25	% v/v	POSDIR				
17	Untreated						1.3	1.7	6.7	5.7
LSD (P=.05)							2.02	1.85	1.61	1.00
Standard Deviation							1.21	1.11	0.96	0.60
CV							26.62	21.98	10.16	6.48

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Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CORW	LATH	Bell Pepper	Bell Pepper	Bell Pepper
Pest Code							CORW	LATH			
Description									Bell Pepper	Bell Pepper	Bell Pepper
Rating Date							22/Jun/2009	22/Jun/2009	6/Aug/2009	6/Aug/2009	18/Aug/2009
Rating Data Type							RATING	RATING	FRUIT	WEIGHT	FRUIT
Rating Unit							1-10	1-10	#	KG	#
1	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	1.3	9.3	8.3	3.05	24.3
2	fomesafen	2	EC	0.5	lb ai/a	PRT	10.0	10.0	16.7	3.76	30.7
3	napropamide	50	DF	2	lb ai/a	POT	1.0	9.3	9.3	1.67	14.3
	s-metolachlor	7.62	EC	1.9	lb ai/a	PO1					
4	napropamide-UV	50	DF	2	lb ai/a	POT	2.0	8.0	15.0	3.43	35.7
5	napropamide	50	DF	2	lb ai/a	POT	1.3	6.3	12.3	2.48	37.3
6	pendimethalin	3.8	CS	0.95	lb ai/a	PRT	1.0	9.0	7.7	1.65	21.3
7	pendimethalin	3.8	CS	0.95	lb ai/a	POT	1.0	9.7	2.0	0.29	24.3
8	pendimethalin	3.8	CS	0.95	lb ai/a	PRT	3.3	10.0	10.0	2.18	29.7
	metribuzin	75	DF	0.188	lb ai/a	PRT					
9	pendimethalin	3.8	CS	0.95	lb ai/a	POT	4.7	10.0	0.0	0.00	6.3
	metribuzin	75	DF	0.188	lb ai/a	POT					
10	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	9.7	10.0	8.0	1.62	18.3
	clomazone	3	ME	0.5	lb ai/a	POT					
11	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	5.7	10.0	7.0	1.53	24.0
	rimsulfuron	25	DF	0.031	lb ai/a	PO1					
12	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	7.7	10.0	9.3	1.86	24.0
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
13	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	8.0	10.0	8.3	1.58	21.3
	metribuzin	75	DF	0.25	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
14	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	7.7	10.0	11.0	1.88	19.0
	pyraflufen	0.208	EC	0.00163	lb ai/a	POSDIR					
	NIS	100	SL	0.25	% v/v	POSDIR					
15	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	8.3	10.0	11.3	2.37	28.3
	pyraflufen	0.208	EC	0.00163	lb ai/a	POSDIR					
	clethodim	0.97	EC	0.09	lb ai/a	POSDIR					
	NIS	100	SL	0.25	% v/v	POSDIR					
16	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	9.7	10.0	7.7	1.63	17.7
	pyraflufen	0.208	EC	0.00163	lb ai/a	POSDIR					
	halosulfuron	75	WG	0.023	lb ai/a	POSDIR					
	clethodim	0.97	EC	0.09	lb ai/a	POSDIR					
	NIS	100	SL	0.25	% v/v	POSDIR					
17	Untreated						2.3	5.0	8.3	1.67	25.3
LSD (P=.05)							1.90	1.87	6.58	1.616	17.47
Standard Deviation							1.14	1.12	3.95	0.969	10.48
CV							22.91	12.16	44.04	50.46	44.31

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Pest Code Description Rating Date Rating Data Type Rating Unit							Bell Pepper 18/Aug/2009 WEIGHT KG	Bell Pepper 10/Sep/2009 FRUIT #	Bell Pepper 10/Sep/2009 WEIGHT KG	Bell Pepper 29/Sep/2009 FRUIT #
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage				
1	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	4.21	19.0	4.14	45.0
2	fomesafen	2	EC	0.5	lb ai/a	PRT	6.29	13.3	2.80	38.3
3	napropamide	50	DF	2	lb ai/a	POT	2.35	10.0	1.75	26.7
	s-metolachlor	7.62	EC	1.9	lb ai/a	PO1				
4	napropamide-UV	50	DF	2	lb ai/a	POT	6.91	23.0	4.18	33.7
5	napropamide	50	DF	2	lb ai/a	POT	7.29	11.7	2.50	36.0
6	pendimethalin	3.8	CS	0.95	lb ai/a	PRT	3.83	19.7	3.41	34.3
7	pendimethalin	3.8	CS	0.95	lb ai/a	POT	4.03	21.7	4.24	42.7
8	pendimethalin	3.8	CS	0.95	lb ai/a	PRT	5.39	16.3	3.55	37.7
	metribuzin	75	DF	0.188	lb ai/a	PRT				
9	pendimethalin	3.8	CS	0.95	lb ai/a	POT	0.98	2.7	0.49	8.4
	metribuzin	75	DF	0.188	lb ai/a	POT				
10	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	3.20	17.7	3.28	29.0
	clomazone	3	ME	0.5	lb ai/a	POT				
11	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	4.13	17.3	2.93	40.7
	rimsulfuron	25	DF	0.031	lb ai/a	PO1				
12	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	4.17	12.7	2.64	38.7
	halosulfuron	75	WG	0.023	lb ai/a	PO1				
13	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	3.18	32.7	6.39	31.3
	metribuzin	75	DF	0.25	lb ai/a	PO1				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1				
	NIS	100	SL	0.25	% v/v	PO1				
14	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	3.55	20.3	4.29	31.0
	pyraflufen	0.208	EC	0.00163	lb ai/a	POSDIR				
	NIS	100	SL	0.25	% v/v	POSDIR				
15	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	4.91	21.3	4.58	27.7
	pyraflufen	0.208	EC	0.00163	lb ai/a	POSDIR				
	clethodim	0.97	EC	0.09	lb ai/a	POSDIR				
	NIS	100	SL	0.25	% v/v	POSDIR				
16	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	3.13	13.0	2.49	28.3
	pyraflufen	0.208	EC	0.00163	lb ai/a	POSDIR				
	halosulfuron	75	WG	0.023	lb ai/a	POSDIR				
	clethodim	0.97	EC	0.09	lb ai/a	POSDIR				
	NIS	100	SL	0.25	% v/v	POSDIR				
17	Untreated						4.67	10.3	1.81	23.0
LSD (P=.05)							3.288	13.03	2.632	23.10
Standard Deviation							1.972	7.82	1.578	13.85
CV							46.42	47.02	48.37	42.63

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Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Bell Pepper 29/Sep/2009 WEIGHT KG	Bell Pepper TOTAL # #	Bell Pepper TOTAL WT KG	Tomato 21/Aug/2009 HARVEST KG	Tomato 27/Aug/2009 HARVEST KG
1	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	7.37	96.7	18.77	6.03	8.15
2	fomesafen	2	EC	0.5	lb ai/a	PRT	7.59	99.0	20.44	9.30	17.22
3	napropamide	50	DF	2	lb ai/a	POT	4.54	60.3	10.31	10.76	10.27
	s-metolachlor	7.62	EC	1.9	lb ai/a	PO1					
4	napropamide-UV	50	DF	2	lb ai/a	POT	5.09	107.3	19.61	14.84	18.75
5	napropamide	50	DF	2	lb ai/a	POT	6.39	97.3	18.66	9.93	16.02
6	pendimethalin	3.8	CS	0.95	lb ai/a	PRT	5.89	83.0	14.79	9.83	12.66
7	pendimethalin	3.8	CS	0.95	lb ai/a	POT	7.17	90.7	15.74	3.31	5.83
8	pendimethalin	3.8	CS	0.95	lb ai/a	PRT	7.44	93.7	18.57	11.12	19.94
	metribuzin	75	DF	0.188	lb ai/a	PRT					
9	pendimethalin	3.8	CS	0.95	lb ai/a	POT	0.85	13.7	2.32	8.11	9.29
	metribuzin	75	DF	0.188	lb ai/a	POT					
10	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	5.17	73.0	13.27	3.26	6.88
	clomazone	3	ME	0.5	lb ai/a	POT					
11	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	6.47	89.0	15.06	2.91	6.59
	rimsulfuron	25	DF	0.031	lb ai/a	PO1					
12	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	7.10	84.7	15.77	3.23	4.84
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
13	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	5.87	93.7	17.02	10.85	7.35
	metribuzin	75	DF	0.25	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
14	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	5.18	81.3	14.90	3.43	7.44
	pyraflufen	0.208	EC	0.00163	lb ai/a	POSDIR					
	NIS	100	SL	0.25	% v/v	POSDIR					
15	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	4.95	88.7	16.80	4.40	8.40
	pyraflufen	0.208	EC	0.00163	lb ai/a	POSDIR					
	clethodim	0.97	EC	0.09	lb ai/a	POSDIR					
	NIS	100	SL	0.25	% v/v	POSDIR					
16	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	4.56	66.7	11.82	4.99	9.56
	pyraflufen	0.208	EC	0.00163	lb ai/a	POSDIR					
	halosulfuron	75	WG	0.023	lb ai/a	POSDIR					
	clethodim	0.97	EC	0.09	lb ai/a	POSDIR					
	NIS	100	SL	0.25	% v/v	POSDIR					
17	Untreated						4.03	67.0	12.19	10.41	17.96
LSD (P=.05)							3.619	35.51	7.172	5.516	6.565
Standard Deviation							2.170	21.30	4.302	3.308	3.938
CV							38.57	26.13	28.56	44.39	35.77

Weed Control in Bell Pepper and Tomato – HTRC 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Tomato 3/Sep/2009 HARVEST KG	Tomato 10/Sep/2009 HARVEST KG	Tomato 17/Sep/2009 HARVEST KG	Tomato 24/Sep/2009 HARVEST KG	Tomato TOTAL WT KG
1	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	8.66	16.80	10.87	25.45	75.95
2	fomesafen	2	EC	0.5	lb ai/a	PRT	16.69	25.10	29.80	32.55	130.67
3	napropamide	50	DF	2	lb ai/a	POT	17.95	16.15	14.24	28.13	97.50
	s-metolachlor	7.62	EC	1.9	lb ai/a	PO1					
4	napropamide-UV	50	DF	2	lb ai/a	POT	23.93	23.15	15.22	31.81	127.69
5	napropamide	50	DF	2	lb ai/a	POT	13.41	19.75	16.26	20.32	95.69
6	pendimethalin	3.8	CS	0.95	lb ai/a	PRT	18.06	16.79	14.68	30.77	102.80
7	pendimethalin	3.8	CS	0.95	lb ai/a	POT	6.66	6.45	8.46	25.54	56.24
8	pendimethalin	3.8	CS	0.95	lb ai/a	PRT	23.89	28.93	20.50	29.44	133.83
	metribuzin	75	DF	0.188	lb ai/a	PRT					
9	pendimethalin	3.8	CS	0.95	lb ai/a	POT	11.11	16.95	13.39	23.29	82.13
	metribuzin	75	DF	0.188	lb ai/a	POT					
10	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	14.27	25.16	15.90	33.89	99.35
	clomazone	3	ME	0.5	lb ai/a	POT					
11	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	11.35	14.59	17.72	29.19	82.34
	rimsulfuron	25	DF	0.031	lb ai/a	PO1					
12	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	12.93	15.87	12.20	34.37	83.44
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
13	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	14.14	22.52	18.73	36.85	110.45
	metribuzin	75	DF	0.25	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
	NIS	100	SL	0.25	% v/v	PO1					
14	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	14.22	17.12	13.54	34.69	90.44
	pyraflufen	0.208	EC	0.00163	lb ai/a	POSDIR					
	NIS	100	SL	0.25	% v/v	POSDIR					
15	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	12.75	19.51	16.81	37.88	99.75
	pyraflufen	0.208	EC	0.00163	lb ai/a	POSDIR					
	clethodim	0.97	EC	0.09	lb ai/a	POSDIR					
	NIS	100	SL	0.25	% v/v	POSDIR					
16	s-metolachlor	7.62	EC	1.9	lb ai/a	POT	14.07	20.74	22.31	40.87	112.53
	pyraflufen	0.208	EC	0.00163	lb ai/a	POSDIR					
	halosulfuron	75	WG	0.023	lb ai/a	POSDIR					
	clethodim	0.97	EC	0.09	lb ai/a	POSDIR					
	NIS	100	SL	0.25	% v/v	POSDIR					
17	Untreated						16.39	12.55	11.18	24.97	93.45
LSD (P=.05)							8.649	9.737	8.763	13.172	31.674
Standard Deviation							5.187	5.840	5.256	7.900	18.997
CV							35.21	31.21	32.87	25.83	19.29

Weed Control in Pumpkin and Squash – HTRC 2009

Project Code: WC 108-09-01 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Pumpkin, Squash **Variety: Howden, Waltham Butternut, Golden Hubbard**
Planting Method: seeded **Planting Date: 6/3/09**
Spacing: 10 inch **Row Spacing: 28 inch; 1 row each crop/plot**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 16 ft wide x 50 ft long

Soil Type: Capac Loam **OM: 2.0%** **pH: 6.4**
Sand: 53.8% **Silt: 33.8%** **Clay: 12.4%** **CEC: 6.2**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	6/5/09	2:30 pm	76/74	F	Moderate	6 SW	24	0% Cloudy	N
PO1	6/25/09	10:30 am	86/79	F	Dry	1-3 W	72	3% Cloudy	N
POSDIR	6/25/09			F					

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
6/25	PUMPKIN, SQUASH	1-4″		
6/25	COLQ = common lambsquarters	1-3″		Moderate
6/25	GRFT = green foxtail	1-4″		Many
6/25	RRPW = redroot pigweed	<1″		Many
6/25	WIRA = wild radish	1″		Many

Notes and Comments
1. Sprays applied with 16 ft, 12 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 tractor mounted sprayer.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.

Weed Control in Pumpkin and Squash – HTRC 2009

Dept. of Horticulture, MSU

Trial ID: WC 108-09-01 Study Director: Dr. Bernard Zandstra
Location: HTRC Investigator: Rodney Tocco, Jr

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Howden	Hubbard	Butternut	COLQ	GRFT
Pest Code										COLQ	GRFT
Description							Howden	Hubbard	Butternut		
Rating Date							25/Jun/2009	25/Jun/2009	25/Jun/2009	25/Jun/2009	25/Jun/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	ethalfluralin	3	EC	1.13	lb ai/a	PRE	1.0	1.0	3.5	8.5	7.0
2	ethalfluralin	3	EC	1.13	lb ai/a	PRE	4.0	2.5	1.5	10.0	10.0
	clomazone	3	ME	0.375	lb ai/a	PRE					
3	enthalfluralin	2.1	SE	6	pt/a	PRE	4.5	3.5	4.5	10.0	10.0
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	5.0	5.0	6.0	8.0	9.5
5	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	3.5	3.5	4.0	7.0	10.0
6	ethalfluralin	3	EC	0.75	lb ai/a	PRE	6.0	4.5	5.0	7.5	10.0
	halosulfuron	75	WG	0.023	lb ai/a	PRE					
7	ethalfluralin	3	EC	1.13	lb ai/a	PRE	7.0	5.5	6.0	10.0	10.0
	halosulfuron	75	WG	0.047	lb ai/a	PRE					
8	ethalfluralin	3	EC	1.13	lb ai/a	PRE	3.5	5.5	6.0	10.0	10.0
	sulfentrazone	4	F	0.14	lb ai/a	PRE					
9	ethalfluralin	3	EC	1.13	lb ai/a	PRE	7.5	5.0	5.0	10.0	10.0
	imazosulfuron	75	WDG	0.1	lb ai/a	PRE					
10	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	3.0	3.5	4.5	6.0	10.0
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
11	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	4.0	4.0	4.5	7.0	10.0
	imazosulfuron	75	WDG	0.1	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
12	ethalfluralin	3	EC	1.13	lb ai/a	PRE	2.0	2.0	6.5	9.5	7.5
	flumioxazin	51	WDG	0.032	lb ai/a	POSDIR					
13	fomesafen	2	EC	0.5	lb ai/a	PRE		9.0	9.5	10.0	10.0
14	Untreated					PRE		1.0	1.0	1.0	1.0
	halosulfuron	75	WG	0.023	lb ai/a	POSDIR					
	sethoxydim	1.53	EC	0.19	lb ai/a	POSDIR					
LSD (P=.05)							1.26	1.54	3.12	3.01	0.55
Standard Deviation							0.53	0.71	1.45	1.39	0.26
CV							12.58	17.98	29.99	17.02	2.88

Weed Control in Pumpkin and Squash – HTRC 2009

Dept. of Horticulture, MSU

Pest Code							RRPW	WIRA			
Description									Howden	Hubbard	Butternut
Rating Date							25/Jun/2009	25/Jun/2009	6/Jul/2009	6/Jul/2009	6/Jul/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	ethalfluralin	3	EC	1.13	lb ai/a	PRE	8.0	7.0	1.7	1.0	4.3
2	ethalfluralin	3	EC	1.13	lb ai/a	PRE	9.5	8.5	3.0	1.3	1.3
	clomazone	3	ME	0.375	lb ai/a	PRE					
3	enthalfluralin	2.1	SE	6	pt/a	PRE	10.0	7.5	2.0	1.3	1.7
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	10.0	8.5	2.5	2.3	3.3
5	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	10.0	6.5	1.7	2.0	2.0
6	ethalfluralin	3	EC	0.75	lb ai/a	PRE	9.0	9.0	2.5	1.7	2.0
	halosulfuron	75	WG	0.023	lb ai/a	PRE					
7	ethalfluralin	3	EC	1.13	lb ai/a	PRE	10.0	10.0	4.5	3.7	4.7
	halosulfuron	75	WG	0.047	lb ai/a	PRE					
8	ethalfluralin	3	EC	1.13	lb ai/a	PRE	10.0	9.0	2.0	3.0	3.0
	sulfentrazone	4	F	0.14	lb ai/a	PRE					
9	ethalfluralin	3	EC	1.13	lb ai/a	PRE	10.0	10.0	3.0	3.7	4.7
	imazosulfuron	75	WDG	0.1	lb ai/a	PRE					
10	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	10.0	8.0	2.0	2.0	2.0
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
11	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	10.0	8.5	2.5	2.0	2.0
	imazosulfuron	75	WDG	0.1	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
12	ethalfluralin	3	EC	1.13	lb ai/a	PRE	7.0	6.5	3.0	4.3	4.7
	flumioxazin	51	WDG	0.032	lb ai/a	POSDIR					
13	fomesafen	2	EC	0.5	lb ai/a	PRE	10.0	10.0	10.0	8.0	8.0
14	Untreated					PRE	1.0	1.0	1.0	1.0	1.7
	halosulfuron	75	WG	0.023	lb ai/a	POSDIR					
	sethoxydim	1.53	EC	0.19	lb ai/a	POSDIR					
LSD (P=.05)							1.14	2.11	1.62	2.24	3.41
Standard Deviation							0.53	0.98	0.93	1.33	2.03
CV							5.92	12.44	31.49	50.06	62.65

Weed Control in Pumpkin and Squash – HTRC 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	GRFT	COLQ	EBNS	WIRA	ORN Howden
Pest Code							GRFT	COLQ	EBNS	WIRA	
Description											ORN Howden
Rating Date							6/Jul/2009	6/Jul/2009	6/Jul/2009	6/Jul/2009	30/Sep/2009
Rating Data Type							RATING	RATING	RATING	RATING	FRUIT
Rating Unit							1-10	1-10	1-10	1-10	#
1	ethalfluralin	3	EC	1.13	lb ai/a	PRE	6.3	9.7	5.0	6.7	23.7
2	ethalfluralin	3	EC	1.13	lb ai/a	PRE	10.0	10.0	9.0	9.0	23.7
	clomazone	3	ME	0.375	lb ai/a	PRE					
3	enthalfluralin	2.1	SE	6	pt/a	PRE	10.0	10.0	10.0	7.3	26.7
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	9.0	10.0	6.3	9.0	18.0
5	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	7.0	9.3	6.7	6.3	18.3
6	ethalfluralin	3	EC	0.75	lb ai/a	PRE	9.3	8.0	9.0	9.0	26.0
	halosulfuron	75	WG	0.023	lb ai/a	PRE					
7	ethalfluralin	3	EC	1.13	lb ai/a	PRE	9.0	10.0	9.0	10.0	18.0
	halosulfuron	75	WG	0.047	lb ai/a	PRE					
8	ethalfluralin	3	EC	1.13	lb ai/a	PRE	10.0	10.0	10.0	9.7	17.3
	sulfentrazone	4	F	0.14	lb ai/a	PRE					
9	ethalfluralin	3	EC	1.13	lb ai/a	PRE	8.7	10.0	5.3	9.7	17.3
	imazosulfuron	75	WDG	0.1	lb ai/a	PRE					
10	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	10.0	4.3	10.0	10.0	23.0
	halosulfuron	75	WG	0.023	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
11	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	10.0	3.0	10.0	10.0	26.3
	imazosulfuron	75	WDG	0.1	lb ai/a	PO1					
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1					
12	ethalfluralin	3	EC	1.13	lb ai/a	PRE	3.3	10.0	10.0	4.3	16.7
	flumioxazin	51	WDG	0.032	lb ai/a	POSDIR					
13	fomesafen	2	EC	0.5	lb ai/a	PRE	9.7	10.0	10.0	10.0	7.3
14	Untreated					PRE	8.0	1.7	2.0	10.0	27.3
	halosulfuron	75	WG	0.023	lb ai/a	POSDIR					
	sethoxydim	1.53	EC	0.19	lb ai/a	POSDIR					
LSD (P=.05)							2.94	2.26	3.78	2.85	9.30
Standard Deviation							1.75	1.35	2.25	1.70	5.54
CV							20.39	16.24	28.08	19.65	26.78

Weed Control in Pumpkin and Squash – HTRC 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	ORN Howden 30/Sep/2009 WEIGHT KG	GRN Howden 30/Sep/2009 FRUIT #	GRN Howden 30/Sep/2009 WEIGHT KG	Golden Hubbard 30/Sep/2009 FRUIT #
Pest Code										
Description										
Rating Date										
Rating Data Type										
Rating Unit										
1	ethalfluralin	3	EC	1.13	lb ai/a	PRE	164.77	6.0	48.55	12.7
2	ethalfluralin	3	EC	1.13	lb ai/a	PRE	188.10	6.0	36.72	13.0
	clomazone	3	ME	0.375	lb ai/a	PRE				
3	enthalfluralin	2.1	SE	6	pt/a	PRE	137.65	7.7	53.12	14.0
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	165.17	6.7	44.73	13.5
5	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	140.60	5.0	31.27	18.3
6	ethalfluralin	3	EC	0.75	lb ai/a	PRE	204.07	9.3	58.01	16.5
	halosulfuron	75	WG	0.023	lb ai/a	PRE				
7	ethalfluralin	3	EC	1.13	lb ai/a	PRE	154.38	7.7	58.52	12.0
	halosulfuron	75	WG	0.047	lb ai/a	PRE				
8	ethalfluralin	3	EC	1.13	lb ai/a	PRE	134.83	8.0	67.75	19.3
	sulfentrazone	4	F	0.14	lb ai/a	PRE				
9	ethalfluralin	3	EC	1.13	lb ai/a	PRE	133.56	10.3	71.12	11.3
	imazosulfuron	75	WDG	0.1	lb ai/a	PRE				
10	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	179.07	9.3	79.49	17.3
	halosulfuron	75	WG	0.023	lb ai/a	PO1				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1				
11	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	185.53	11.0	80.47	15.5
	imazosulfuron	75	WDG	0.1	lb ai/a	PO1				
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1				
12	ethalfluralin	3	EC	1.13	lb ai/a	PRE	131.75	9.7	88.89	14.5
	flumioxazin	51	WDG	0.032	lb ai/a	POSDIR				
13	fomesafen	2	EC	0.5	lb ai/a	PRE	65.49	10.0	89.87	
14	Untreated					PRE	199.04	9.3	56.10	23.0
	halosulfuron	75	WG	0.023	lb ai/a	POSDIR				
	sethoxydim	1.53	EC	0.19	lb ai/a	POSDIR				
LSD (P=.05)							79.303	6.76	63.877	8.52
Standard Deviation							47.240	4.02	38.051	4.89
CV							30.28	48.58	61.61	31.66

Weed Control in Pumpkin and Squash – HTRC 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Golden Hubbard 30/Sep/2009 WEIGHT KG	Butternut 30/Sep/2009 FRUIT #	Butternut 30/Sep/2009 WEIGHT KG
1	ethalfluralin	3	EC	1.13	lb ai/a	PRE	17.99	7.0	7.21
2	ethalfluralin	3	EC	1.13	lb ai/a	PRE	25.38	36.3	36.22
	clomazone	3	ME	0.375	lb ai/a	PRE			
3	enthalfluralin	2.1	SE	6	pt/a	PRE	19.87	13.7	11.24
4	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	20.51	16.7	15.18
5	s-metolachlor	7.62	EC	1.9	lb ai/a	PRE	24.36	16.7	13.89
6	ethalfluralin	3	EC	0.75	lb ai/a	PRE	22.49	19.3	17.35
	halosulfuron	75	WG	0.023	lb ai/a	PRE			
7	ethalfluralin	3	EC	1.13	lb ai/a	PRE	16.95	19.7	18.23
	halosulfuron	75	WG	0.047	lb ai/a	PRE			
8	ethalfluralin	3	EC	1.13	lb ai/a	PRE	37.93	22.7	19.94
	sulfentrazone	4	F	0.14	lb ai/a	PRE			
9	ethalfluralin	3	EC	1.13	lb ai/a	PRE	20.93	22.0	19.60
	imazosulfuron	75	WDG	0.1	lb ai/a	PRE			
10	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	27.74	31.3	25.25
	halosulfuron	75	WG	0.023	lb ai/a	PO1			
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1			
11	s-metolachlor	7.62	EC	1.26	lb ai/a	PRE	24.64	33.0	25.16
	imazosulfuron	75	WDG	0.1	lb ai/a	PO1			
	sethoxydim	1.53	EC	0.19	lb ai/a	PO1			
12	ethalfluralin	3	EC	1.13	lb ai/a	PRE	22.62	6.3	6.33
	flumioxazin	51	WDG	0.032	lb ai/a	POSDIR			
13	fomesafen	2	EC	0.5	lb ai/a	PRE		9.7	8.02
14	Untreated					PRE	34.21	24.3	17.99
	halosulfuron	75	WG	0.023	lb ai/a	POSDIR			
	sethoxydim	1.53	EC	0.19	lb ai/a	POSDIR			
LSD (P=.05)							14.731	14.07	11.909
Standard Deviation							8.467	8.37	7.080
CV							34.88	42.04	41.02

Weed Control in Rhubarb – Fall 2008 & Spring 2009

Project Code: WC 102-09-01 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Rhubarb **Variety: German Wine**
Planting Method: Root Divisions **Planting Date: 5/21/07**
Spacing: 4 FT **Row Spacing: 6 FT**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.3 ft wide x 24 ft long; 6 plants/plot

Soil Type: Marlette Fine Sandy Loam **OM: 2.6%** **pH: 5.6**
Sand: 73.8% **Silt: 20.5%** **Clay: 5.7%** **CEC: 8.4**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
FALL08PRE	11/3/08	3:00 pm	72/55	F	Damp	3 SW	61	0% Cloudy	N
SPRING09PRE	3/27/09	10:30 am	54/42	F	Dry	4-5 W	52	10% Cloudy	N
PO1	5/5/09	11:30 am	69/55	F	Moist	7 SW	52	0% Cloudy	N

Crop and Weed Information at Application

Date	Crop or Weed	Height or Diameter	Growth Stage	Density
11/3	RHUBARB			
3/27	RHUBARB		Dormant	
3/27	COCW = common chickweed	2-4″		Few
3/27	QUGR = quackgrass	4-6″		Few
3/27	WHCA = white campion	2-4″		Few
3/27	WHCL = white clover	2″		Few
5/5	RHUBARB			
5/5	DAND = dandelion			Many
5/5	HOWE = horseweed			Moderate
5/5	QUGR = quackgrass			Many
5/5	WHCL = white clover			Many
5/5	WICA = wild carrot			Few

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.

Weed Control in Rhubarb – Fall 2008 & Spring 2009

Dept. of Horticulture, MSU

Trial ID: 102-09-01 Study Director: Dr. Bernard Zandstra
Location: HTRC B.119 Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	RHUBARB 30/Apr/2009 RATING 1-10	QUGR 30/Apr/2009 RATING 1-10	DAND 30/Apr/2009 RATING 1-10	WHCA 30/Apr/2009 RATING 1-10	RHUBARB 7/May/2009 RATING 1-10
1	pronamide	50	WP	2	lb ai/a	FALL08	2.3	5.7	1.7	1.0	2.0
2	pronamide	50	WP	2	lb ai/a	FALL08	2.0	7.0	1.0	2.7	2.0
	clethodim	0.97	EC	0.12	lb ai/a	FALL08					
	COC	100	SL	1	lb ai/a	FALL08					
3	mesotrione	4	SC	0.188	lb ai/a	FALL08	2.3	5.7	9.0	6.7	2.0
	pronamide	50	WP	2	lb ai/a	FALL08					
4	sulfentrazone	4	F	0.375	lb ai/a	FALL08	1.3	5.7	1.7	1.0	1.3
5	halosulfuron	75	WG	0.047	lb ai/a	FALL08	1.7	7.3	2.7	1.7	1.7
	pronamide	50	WP	2	lb ai/a	FALL08					
6	pronamide	50	WP	2	lb ai/a	Spring09	2.7	5.7	1.3	1.0	2.3
	quinclorac	75	DF	0.375	lb ai/a	PO1					
7	s-metolachlor	7.62	EC	1.3	lb ai/a	Spring09	1.3	3.0	1.7	1.0	1.3
8	simazine	90	WDG	2	lb ai/a	Spring09	1.3	5.3	3.7	3.0	1.7
9	sulfentrazone	4	F	0.375	lb ai/a	Spring09	1.7	5.0	2.3	5.7	1.3
10	glyphosate	5.5	L	1	lb ai/a	FALL08	2.3	10.0	10.0	9.7	2.0
	Ammonium Sulfate	100	SG	2.5	lb ai/a	FALL08					
	pronamide	50	WP	2	lb ai/a	Spring09					
LSD (P=.05)							1.48	4.94	2.66	3.80	1.26
Standard Deviation							0.86	2.88	1.55	2.22	0.74
CV							45.41	47.77	44.3	66.51	41.62

Weed Control in Rhubarb – Fall 2008 & Spring 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	QUGR	DAND	WHCA	HOWE	RHUBARB
Pest Code							QUGR	DAND	WHCA	HOWE	
Description											RHUBARB
Rating Date							7/May/2009	7/May/2009	7/May/2009	7/May/2009	9/Jun/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	pronamide	50	WP	2	lb ai/a	FALL08	4.0	3.0	1.7	6.7	3.7
2	pronamide	50	WP	2	lb ai/a	FALL08	6.3	2.7	1.0	1.0	2.3
	clethodim	0.97	EC	0.12	lb ai/a	FALL08					
	COC	100	SL	1	lb ai/a	FALL08					
3	mesotrione	4	SC	0.188	lb ai/a	FALL08	5.7	9.3	4.0	9.3	1.7
	pronamide	50	WP	2	lb ai/a	FALL08					
4	sulfentrazone	4	F	0.375	lb ai/a	FALL08	4.3	3.0	3.3	9.7	4.0
5	halosulfuron	75	WG	0.047	lb ai/a	FALL08	7.0	3.7	4.0	9.7	2.3
	pronamide	50	WP	2	lb ai/a	FALL08					
6	pronamide	50	WP	2	lb ai/a	Spring09	6.3	4.7	3.7	6.7	4.3
	quinclorac	75	DF	0.375	lb ai/a	PO1					
7	s-metolachlor	7.62	EC	1.3	lb ai/a	Spring09	3.0	4.0	4.0	3.0	2.0
8	simazine	90	WDG	2	lb ai/a	Spring09	4.7	4.7	5.3	10.0	2.0
9	sulfentrazone	4	F	0.375	lb ai/a	Spring09	5.3	4.7	5.0	7.7	1.7
10	glyphosate	5.5	L	1	lb ai/a	FALL08	9.3	9.7	10.0	10.0	2.7
	Ammonium Sulfate	100	SG	2.5	lb ai/a	FALL08					
	pronamide	50	WP	2	lb ai/a	Spring09					
LSD (P=.05)							4.77	2.84	6.61	3.91	3.10
Standard Deviation							2.78	1.65	3.85	2.28	1.81
CV							49.67	33.51	91.75	30.94	67.78

Weed Control in Rhubarb – Fall 2008 & Spring 2009

Dept. of Horticulture, MSU

Pest Code							QUGR	CATH	ROFB	WHCA	WHCL
Description											
Rating Date							9/Jun/2009	9/Jun/2009	9/Jun/2009	9/Jun/2009	9/Jun/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	pronamide	50	WP	2	lb ai/a	FALL08	5.3	6.3	3.7	8.0	4.0
2	pronamide	50	WP	2	lb ai/a	FALL08	6.3	7.0	7.0	7.0	7.3
	clethodim	0.97	EC	0.12	lb ai/a	FALL08					
	COC	100	SL	1	lb ai/a	FALL08					
3	mesotrione	4	SC	0.188	lb ai/a	FALL08	4.7	4.0	10.0	4.0	7.7
	pronamide	50	WP	2	lb ai/a	FALL08					
4	sulfentrazone	4	F	0.375	lb ai/a	FALL08	4.3	4.3	7.3	4.0	7.3
5	halosulfuron	75	WG	0.047	lb ai/a	FALL08	6.3	4.0	9.3	4.7	4.0
	pronamide	50	WP	2	lb ai/a	FALL08					
6	pronamide	50	WP	2	lb ai/a	Spring09	5.3	9.3	10.0	5.0	7.7
	quinclorac	75	DF	0.375	lb ai/a	PO1					
7	s-metolachlor	7.62	EC	1.3	lb ai/a	Spring09	2.3	7.0	4.3	4.7	1.3
8	simazine	90	WDG	2	lb ai/a	Spring09	5.7	4.7	10.0	6.3	5.0
9	sulfentrazone	4	F	0.375	lb ai/a	Spring09	4.3	5.0	6.7	7.0	3.3
10	glyphosate	5.5	L	1	lb ai/a	FALL08	8.0	9.3	9.7	9.3	8.7
	Ammonium Sulfate	100	SG	2.5	lb ai/a	FALL08					
	pronamide	50	WP	2	lb ai/a	Spring09					
LSD (P=.05)							4.65	5.20	5.49	6.32	6.36
Standard Deviation							2.71	3.03	3.20	3.68	3.71
CV							51.44	49.65	41.06	61.37	65.84

Weed Control in Rhubarb – Fall 2008 & Spring 2009

Dept. of Horticulture, MSU

Pest Code							HOWE		
Description								Rhubarb	Rhubarb
Rating Date							9/Jun/2009	9/Jun/2009	
Rating Data Type							RATING	Number	TOTAL
Rating Unit							1-10	#	KG/PLOT
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage			
1	pronamide	50	WP	2	lb ai/a	FALL08	6.3	5.7	8.08
2	pronamide	50	WP	2	lb ai/a	FALL08	7.3	6.7	13.37
	clethodim	0.97	EC	0.12	lb ai/a	FALL08			
	COC	100	SL	1	lb ai/a	FALL08			
3	mesotrione	4	SC	0.188	lb ai/a	FALL08	10.0	6.3	14.53
	pronamide	50	WP	2	lb ai/a	FALL08			
4	sulfentrazone	4	F	0.375	lb ai/a	FALL08	7.3	4.3	13.23
5	halosulfuron	75	WG	0.047	lb ai/a	FALL08	10.0	7.0	16.30
	pronamide	50	WP	2	lb ai/a	FALL08			
6	pronamide	50	WP	2	lb ai/a	Spring09	10.0	6.7	6.61
	quinclorac	75	DF	0.375	lb ai/a	PO1			
7	s-metolachlor	7.62	EC	1.3	lb ai/a	Spring09	10.0	7.0	11.71
8	simazine	90	WDG	2	lb ai/a	Spring09	6.0	7.3	16.07
9	sulfentrazone	4	F	0.375	lb ai/a	Spring09	8.7	6.7	13.53
10	glyphosate	5.5	L	1	lb ai/a	FALL08	9.0	5.3	12.03
	Ammonium Sulfate	100	SG	2.5	lb ai/a	FALL08			
	pronamide	50	WP	2	lb ai/a	Spring09			
LSD (P=.05)							4.92	2.49	11.093
Standard Deviation							2.87	1.45	6.466
CV							33.84	23.04	51.54

Weed Control in Strawberry – Fall 2008 & Spring 2009

Project Code: WC 126-09-01 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Strawberry **Variety: Jewel**
Planting Method: Transplant **Planting Date: 4/18/08**
Spacing: Solid row **Row Spacing: 6 FT**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.3 ft wide x 30 ft long

Soil Type: Spinks Loamy Sand **OM: 1.3%** **pH: 7.0**
Sand: 88.2% **Silt: 8.1%** **Clay: 3.7%** **CEC: 4.1**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
FALL	11/3/08	2:30 pm	70/58	F	Damp	3 SW	62	0% Cloudy	N
PRE	4/15/09	3:00 pm	66/58	F	Damp	5-9 N	44	5% Cloudy	N

Crop and Weed Information at Application

Date	Crop or Weed	Height or Diameter	Growth Stage	Density
11/3	STBE = strawberry	50% Gr.	Dormant	
11/3	WIRA = wild radish			Few
4/15	STBE = strawberry	100% Gr.		
4/15	ANBG = annual bluegrass	1-3″		Few
4/15	MECR = mouseear cress	1-3″		Moderate
4/15	QUGR = quackgrass	2-4″		Few
4/15	WIRA = wild radish			Few
4/15	WHCA = white campion	1-2″		Many

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.

Weed Control in Strawberry – Fall 2008 & Spring 2009

Dept. of Horticulture, MSU

Trial ID: WC 126-09-01 Study Director: Dr. Bernard Zandstra
Location: HTRC Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Strawberry 30/Apr/2009 RATING 1-10	Strawberry 18/Jun/2009 RATING 1-10	QUGR 18/Jun/2009 RATING 1-10	HOWE 18/Jun/2009 RATING 1-10	Strawberry 12/Jun/2009 Harvest KG
1	terbacil	80	WP	0.4	lb ai/a	FALL08	2.0	1.7	8.3	8.3	0.80
2	sulfentrazone	4	F	0.375	lb ai/a	FALL08	1.3	1.3	8.0	5.3	0.97
3	acifluorfen	2	L	0.375	lb ai/a	FALL08	2.0	3.0	9.3	4.3	0.85
4	oxyfluorfen	4	SC	0.5	lb ai/a	FALL08	2.7	2.7	10.0	2.0	0.69
5	flumioxazin	51	WDG	0.096	lb ai/a	FALL08	2.0	3.3	10.0	4.0	0.31
6	pendimethalin	3.8	CS	1.5	lb ai/a	FALL08	1.3	1.7	9.3	3.0	0.39
7	flumioxazin	51	WDG	0.096	lb ai/a	Spring09	1.7	2.7	9.3	4.3	0.50
8	napropamide	50	DF	4	lb ai/a	Spring09	1.0	1.3	10.0	2.7	0.76
9	acifluorfen	2	L	0.375	lb ai/a	Spring09	2.0	2.0	10.0	2.0	1.03
10	s-metolachlor	7.62	EC	1.3	lb ai/a	Spring09	2.0	1.7	8.3	2.0	1.03
11	sulfentrazone	4	F	0.375	lb ai/a	Spring09	1.7	2.0	9.7	6.7	0.59
12	napropamide-UV	50	DF	4	lb ai/a	Spring09	1.0	2.0	10.0	1.7	0.69
13	Untreated						1.7	2.7	1.0	4.0	0.23
LSD (P=.05)							1.19	1.73	1.63	3.44	0.580
Standard Deviation							0.71	1.03	0.97	2.04	0.344
CV							41.07	47.75	11.12	52.68	50.64

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Strawberry 17/Jun/2009 Harvest KG	Strawberry 19/Jun/2009 Harvest KG	Strawberry 22/Jun/2009 Harvest KG	Strawberry 25/Jun/2009 Harvest KG	Strawberry TOTAL WT. KG
1	terbacil	80	WP	0.4	lb ai/a	FALL08	4.30	2.90	3.94	4.00	15.94
2	sulfentrazone	4	F	0.375	lb ai/a	FALL08	4.67	3.60	5.46	5.61	20.31
3	acifluorfen	2	L	0.375	lb ai/a	FALL08	3.51	3.73	4.63	4.39	17.11
4	oxyfluorfen	4	SC	0.5	lb ai/a	FALL08	3.69	5.05	4.89	3.06	17.38
5	flumioxazin	51	WDG	0.096	lb ai/a	FALL08	3.21	1.75	3.21	3.61	12.10
6	pendimethalin	3.8	CS	1.5	lb ai/a	FALL08	3.48	3.66	5.21	3.97	16.71
7	flumioxazin	51	WDG	0.096	lb ai/a	Spring09	3.42	3.21	3.56	3.54	14.24
8	napropamide	50	DF	4	lb ai/a	Spring09	3.69	3.72	5.05	3.72	16.93
9	acifluorfen	2	L	0.375	lb ai/a	Spring09	4.42	3.97	4.84	3.82	18.07
10	s-metolachlor	7.62	EC	1.3	lb ai/a	Spring09	4.29	3.53	5.74	4.46	19.05
11	sulfentrazone	4	F	0.375	lb ai/a	Spring09	4.65	2.49	4.33	4.24	16.30
12	napropamide-UV	50	DF	4	lb ai/a	Spring09	4.43	3.13	5.23	4.74	18.21
13	Untreated						1.14	1.96	3.32	3.97	10.62
LSD (P=.05)							1.805	1.875	1.847	1.979	3.866
Standard Deviation							1.071	1.112	1.096	1.175	2.294
CV							28.48	33.86	23.98	28.74	14.0

Postemergence Weed Control in Strawberry with Vida – HTRC 2009

Project Code: WC 126-09-02 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Strawberry **Variety: Jewel**
Planting Method: Transplant **Planting Date: 4/18/08**
Spacing: Solid row **Row Spacing: 6 FT**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 32 inches wide x 30 ft long

Soil Type: Marlette Fine Sandy Loam **OM: 1.3%** **pH: 7.0**
Sand: 88.2% **Silt: 8.1%** **Clay: 3.7%** **CEC: 4.1**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
POSDIR	5/21/09	12:05 pm	77/70	F	Dry	7-8 SW	35	0% Cloudy	N

Crop and Weed Information at Application

Date	Crop or Weed	Height or Diameter	Growth Stage	Density
5/21	STBE = strawberry	6″	Blooming	
5/21	COCW = common chickweed	3-5″		Many
5/21	MWCH = Mayweed chamomile	4-8″		Few
5/21	SHPU = shepherd's purse	10-14″		Moderate
5/21	VIPW = virginia pepperweed	16-18″		Moderate

Notes and Comments
1. Apply as directed spray to row middles with 2 nozzle shielded boom.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.

Postemergence Weed Control in Strawberry with Vida – HTRC 2009

Dept. of Horticulture, MSU

Trial ID: WC 126-09-02 Study Director: Dr. Bernard Zandstra
Location: HTRC Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code								VIPW		LACG	VIPW
Description							Strawberry		Strawberry		
Rating Date							18/Jun/2009	18/Jun/2009	13/Jul/2009	13/Jul/2009	13/Jul/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	pyraflufen	0.208	EC	0.00163	lb ai/a	POSDIR	2.0	3.7	2.3	4.0	5.3
	COC	100	SL	1	% v/v	POSDIR					
2	pyraflufen	0.208	EC	0.00325	lb ai/a	POSDIR	2.0	3.3	2.0	5.0	6.3
	COC	100	SL	1	% v/v	POSDIR					
3	pyraflufen	0.208	EC	0.00163	lb ai/a	POSDIR	2.3	5.3	1.7	2.3	8.3
	clethodim	0.97	EC	0.09	lb ai/a	POSDIR					
	COC	100	SL	1	% v/v	POSDIR					
4	flumioxazin	51	WDG	0.096	lb ai/a	POSDIR	2.7	9.0	1.7	9.0	8.7
5	clopyralid	3	EC	0.125	lb ai/a	POSDIR	1.3	4.3	1.3	5.7	9.7
	clethodim	0.97	EC	0.09	lb ai/a	POSDIR					
6	Untreated						1.7	4.0	1.7	3.7	6.3
LSD (P=.05)							1.85	5.44	1.58	3.51	5.25
Standard Deviation							1.02	2.99	0.87	1.93	2.88
CV							50.83	60.52	48.89	39.02	38.75

Weed Control in Apple – Clarksville 2009

Project Code: WC 128-09-01 **Location: Clarksville, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Apple **Variety: Liberty, Empire, Ida Red**
Planting Method: Transplant **Planting Date: 2005**
Spacing: 4 FT **Row Spacing: 15 FT**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 11 ft wide x 60 ft long

Soil Type: Lapeer Sandy Loam **OM: 2.2%** **pH: 6.8**
Sand: 43.8% **Silt: 44.5%** **Clay: 11.7%** **CEC: 6.7**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
FALL08	10/29/08	2:00 pm	43/43	F	Damp	5-6 NW	51	50% Cloudy	N
EPRE	4/16/09	1:00 pm	58/48	F	Damp	7.0 NE	34	0% Cloudy	N
LPRE	5/15/09	2:00 pm	65/59	F	Damp	5.0 S	60	100% Cloudy	N
EPOS	6/9/09	10:15 am	63/61	F	Moist	5-7 W	70.2	100% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
10/29	APPLE		Dormant	
10/29	ANBG = annual bluegrass	3-4″		Many
10/29	COCW = common chickweed	0.5-1″		Many
10/29	HOWE = horseweed (marestail)	0.5-1″		Many
4/16	APPLE	4-6″	Green Tip	
4/16	ANBG = annual bluegrass	2-3″		Many
4/16	COCW = common chickweed	2-3″		Moderate
4/16	MECR = mouseear cress	2-4″	Flower	Few
4/16	PERG = perennial rye grass	2-3″		Moderate
5/15	APPLE	2-3″	Flower	
5/15	COCW = common chickweed	1-3″		Many
5/15	DAND = dandelion	4-8″		Few
5/15	HOWE = horseweed	1-3″		Many
5/15	PERG = perennial rye grass	4-6″		Many
5/15	PRKW = prostrate knotweed	1-3″		Few
5/15	PUDN = purple deadnettle	1-5″		Few
5/15	SHPU = shepherd's purse	2-6″		Moderate
5/15	YERO = yellow rocket	12-16″		Moderate
6/9	APPLE		Small Fruit	Many
6/9	HOWE = horseweed	6-12″		Many
6/9	PERG = perennial ryegrass	6-8″		Moderate
6/9	PRKW = prostrate knotweed	2-4″		Many
6/9	RSFI = redstem filaree	1-4″		Few
6/9	SHPU = shepherd's purse	6-12″		
6/9	WHCL = white clover	6-12″		Moderate

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer. One pass on each side of row.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.

Weed Control in Apple – Clarksville 2009

Dept. of Horticulture, MSU

Trial ID: 128-09-01 Study Director: Dr. Bernard Zandstra
Location: CHES Investigator: Rodney Tocco

Pest Code								PERG	COCW	DAND	HOWE
Description							APPLE				
Rating Date							15/May/09	15/May/09	15/May/09	15/May/09	15/May/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	Untreated					FALL08	1.0	6.3	9.7	10.0	10.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
2	glyphosate	5.5	L	0.43	lb ai/a	FALL08	1.0	9.3	9.7	10.0	9.7
	2, 4-D	3.8	L	0.5	lb ai/a	FALL08					
	AMS	100	SG	2.5	lb ai/a	FALL08					
3	flumioxazin	51	WDG	0.383	lb ai/a	FALL08	1.3	10.0	10.0	10.0	10.0
	glyphosate	5.5	L	0.43	lb ai/a	FALL08					
	2, 4-D	3.8	L	0.5	lb ai/a	FALL08					
	AMS	100	SG	2.5	lb ai/a	FALL08					
4	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	1.3	8.3	10.0	10.0	10.0
	glyphosate	5.5	L	0.43	lb ai/a	EPRE					
	AMS	100	SG	2.5	lb ai/a	EPRE					
5	flumioxazin	51	WDG	0.383	lb ai/a	LPRE	1.0	3.3	4.0	6.3	3.0
	glyphosate	5.5	L	0.43	lb ai/a	LPRE					
	AMS	100	SG	2.5	lb ai/a	LPRE					
6	flumioxazin	51	WDG	0.256	lb ai/a	LPRE	1.3	2.3	3.7	7.3	3.0
	glyphosate	5.5	L	0.43	lb ai/a	LPRE					
	AMS	100	SG	2.5	lb ai/a	LPRE					
7	saflufenacil	70	WG	0.045	lb ai/a	EPRE	1.0	4.3	9.3	9.0	10.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
8	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	1.0	8.7	10.0	10.0	10.0
	glufosinate	1.67	L	1.02	lb ai/a	EPRE					
9	rimsulfuron	25	DF	0.064	lb ai/a	EPRE	1.0	6.3	9.3	10.0	10.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
10	sulfentrazone	4	F	0.375	lb ai/a	EPRE	1.3	3.0	8.7	7.0	7.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
11	mesotrione	4	SC	0.188	lb ai/a	EPRE	1.3	1.7	9.3	10.0	9.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
12	terbacil	80	WP	2.4	lb ai/a	EPRE	1.0	10.0	10.0	9.3	10.0
	glufosinate	1.67	L	1.04	lb ai/a	EPOS					
LSD (P=.05)							0.64	2.82	3.03	1.98	2.53
Standard Deviation							0.38	1.66	1.79	1.17	1.50
CV							33.02	27.11	20.74	12.86	17.67

Weed Control in Apple – Clarksville 2009

Dept. of Horticulture, MSU

Pest Code							PRKW	SHPU	YERO		PERG
Description										APPLE	
Rating Date							15/May/09	15/May/09	15/May/09	9/Jun/09	9/Jun/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	Untreated					FALL08	10.0	9.3	9.7	1.0	1.7
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
2	glyphosate	5.5	L	0.43	lb ai/a	FALL08	4.3	9.7	9.7	1.7	9.3
	2, 4-D	3.8	L	0.5	lb ai/a	FALL08					
	AMS	100	SG	2.5	lb ai/a	FALL08					
3	flumioxazin	51	WDG	0.383	lb ai/a	FALL08	10.0	10.0	10.0	1.0	10.0
	glyphosate	5.5	L	0.43	lb ai/a	FALL08					
	2, 4-D	3.8	L	0.5	lb ai/a	FALL08					
	AMS	100	SG	2.5	lb ai/a	FALL08					
4	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	10.0	10.0	10.0	1.0	1.7
	glyphosate	5.5	L	0.43	lb ai/a	EPRE					
	AMS	100	SG	2.5	lb ai/a	EPRE					
5	flumioxazin	51	WDG	0.383	lb ai/a	LPRE	7.3	3.3	8.3	3.3	9.0
	glyphosate	5.5	L	0.43	lb ai/a	LPRE					
	AMS	100	SG	2.5	lb ai/a	LPRE					
6	flumioxazin	51	WDG	0.256	lb ai/a	LPRE	9.3	1.7	7.0	2.3	7.7
	glyphosate	5.5	L	0.43	lb ai/a	LPRE					
	AMS	100	SG	2.5	lb ai/a	LPRE					
7	saflufenacil	70	WG	0.045	lb ai/a	EPRE	10.0	7.3	10.0	1.0	1.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
8	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	9.7	10.0	10.0	1.7	6.0
	glufosinate	1.67	L	1.02	lb ai/a	EPRE					
9	rimsulfuron	25	DF	0.064	lb ai/a	EPRE	9.0	9.7	10.0	1.0	6.3
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
10	sulfentrazone	4	F	0.375	lb ai/a	EPRE	10.0	3.0	10.0	1.0	1.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
11	mesotrione	4	SC	0.188	lb ai/a	EPRE	10.0	10.0	10.0	1.0	1.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
12	terbacil	80	WP	2.4	lb ai/a	EPRE	10.0	10.0	10.0	1.0	10.0
	glufosinate	1.67	L	1.04	lb ai/a	EPOS					
LSD (P=.05)							3.31	2.39	2.39	0.74	3.20
Standard Deviation							1.95	1.41	1.41	0.44	1.89
CV							21.37	18.02	14.76	30.72	35.08

Weed Control in Apple – Clarksville 2009

Dept. of Horticulture, MSU

Pest Code							COLQ	HOWE	PRKW	RSFI	SHPU	WHCL
Description												
Rating Date							9/Jun/09	9/Jun/09	9/Jun/09	9/Jun/09	9/Jun/09	9/Jun/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage						
1	Untreated					FALL08	5.3	4.0	7.0	10.0	2.7	8.7
	glyphosate	5.5	L	0.43	lb ai/a	EPOS						
2	glyphosate	5.5	L	0.43	lb ai/a	FALL08	6.3	2.7	4.0	10.0	3.0	9.7
	2, 4-D	3.8	L	0.5	lb ai/a	FALL08						
	AMS	100	SG	2.5	lb ai/a	FALL08						
3	flumioxazin	51	WDG	0.383	lb ai/a	FALL08	10.0	10.0	9.3	10.0	10.0	10.0
	glyphosate	5.5	L	0.43	lb ai/a	FALL08						
	2, 4-D	3.8	L	0.5	lb ai/a	FALL08						
	AMS	100	SG	2.5	lb ai/a	FALL08						
4	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	10.0	9.7	10.0	10.0	9.7	10.0
	glyphosate	5.5	L	0.43	lb ai/a	EPRE						
	AMS	100	SG	2.5	lb ai/a	EPRE						
5	flumioxazin	51	WDG	0.383	lb ai/a	LPRE	10.0	9.7	9.0	10.0	10.0	10.0
	glyphosate	5.5	L	0.43	lb ai/a	LPRE						
	AMS	100	SG	2.5	lb ai/a	LPRE						
6	flumioxazin	51	WDG	0.256	lb ai/a	LPRE	10.0	10.0	10.0	10.0	9.3	10.0
	glyphosate	5.5	L	0.43	lb ai/a	LPRE						
	AMS	100	SG	2.5	lb ai/a	LPRE						
7	saflufenacil	70	WG	0.045	lb ai/a	EPRE	10.0	10.0	9.7	9.3	1.3	10.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS						
8	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	10.0	7.0	6.0	10.0	8.3	10.0
	glufosinate	1.67	L	1.02	lb ai/a	EPRE						
9	rimsulfuron	25	DF	0.064	lb ai/a	EPRE	10.0	9.3	7.0	7.7	8.7	8.7
	glyphosate	5.5	L	0.43	lb ai/a	EPOS						
10	sulfentrazone	4	F	0.375	lb ai/a	EPRE	10.0	4.0	10.0	8.3	6.3	9.3
	glyphosate	5.5	L	0.43	lb ai/a	EPOS						
11	mesotrione	4	SC	0.188	lb ai/a	EPRE	8.0	8.0	10.0	10.0	10.0	10.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS						
12	terbacil	80	WP	2.4	lb ai/a	EPRE	10.0	10.0	10.0	10.0	10.0	10.0
	glufosinate	1.67	L	1.04	lb ai/a	EPOS						
LSD (P=.05)							2.80	3.86	5.20	1.81	2.12	1.60
Standard Deviation							1.65	2.28	3.07	1.07	1.25	0.94
CV							18.06	28.99	36.1	11.12	16.81	9.74

Weed Control in Apple – Clarksville 2009

Dept. of Horticulture, MSU

Pest Code								PERG	HOWE	PRKW	SHPU	WHCL
Description							APPLE					
Rating Date							18/Jun/09	18/Jun/09	18/Jun/09	18/Jun/09	18/Jun/09	18/Jun/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage						
1	Untreated					FALL08	1.0	5.0	10.0	9.3	10.0	9.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS						
2	glyphosate	5.5	L	0.43	lb ai/a	FALL08	1.0	6.0	1.0	4.7	1.0	3.7
	2, 4-D	3.8	L	0.5	lb ai/a	FALL08						
	AMS	100	SG	2.5	lb ai/a	FALL08						
3	flumioxazin	51	WDG	0.383	lb ai/a	FALL08	1.0	10.0	10.0	7.3	10.0	8.7
	glyphosate	5.5	L	0.43	lb ai/a	FALL08						
	2, 4-D	3.8	L	0.5	lb ai/a	FALL08						
	AMS	100	SG	2.5	lb ai/a	FALL08						
4	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	1.0	3.0	7.3	10.0	10.0	7.7
	glyphosate	5.5	L	0.43	lb ai/a	EPRE						
	AMS	100	SG	2.5	lb ai/a	EPRE						
5	flumioxazin	51	WDG	0.383	lb ai/a	LPRE	1.0	9.0	9.7	10.0	10.0	9.7
	glyphosate	5.5	L	0.43	lb ai/a	LPRE						
	AMS	100	SG	2.5	lb ai/a	LPRE						
6	flumioxazin	51	WDG	0.256	lb ai/a	LPRE	1.0	7.0	9.3	10.0	10.0	10.0
	glyphosate	5.5	L	0.43	lb ai/a	LPRE						
	AMS	100	SG	2.5	lb ai/a	LPRE						
7	saflufenacil	70	WG	0.045	lb ai/a	EPRE	1.0	4.7	10.0	7.7	9.3	9.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS						
8	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	1.0	9.0	9.7	9.3	10.0	10.0
	glufosinate	1.67	L	1.02	lb ai/a	EPRE						
9	rimsulfuron	25	DF	0.064	lb ai/a	EPRE	1.0	6.7	10.0	7.7	10.0	9.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS						
10	sulfentrazone	4	F	0.375	lb ai/a	EPRE	1.0	3.0	8.7	10.0	10.0	8.7
	glyphosate	5.5	L	0.43	lb ai/a	EPOS						
11	mesotrione	4	SC	0.188	lb ai/a	EPRE	1.0	3.3	9.7	10.0	10.0	10.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS						
12	terbacil	80	WP	2.4	lb ai/a	EPRE	1.0	10.0	10.0	10.0	10.0	10.0
	glufosinate	1.67	L	1.04	lb ai/a	EPOS						
LSD (P=.05)							0.00	3.42	1.12	4.00	0.56	2.96
Standard Deviation							0.00	2.02	0.66	2.36	0.33	1.75
CV							0.0	31.62	7.53	26.71	3.63	19.92

Weed Control in Apple – Clarksville 2009

Dept. of Horticulture, MSU

Pest Code								LACG	PERG	HOWE	PRKW
Description							APPLE				
Rating Date							7/Jul/09	7/Jul/09	7/Jul/09	7/Jul/09	7/Jul/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	Untreated					FALL08	1.0	8.7	6.3	10.0	7.7
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
2	glyphosate	5.5	L	0.43	lb ai/a	FALL08	1.0	9.3	8.7	1.7	1.7
	2, 4-D	3.8	L	0.5	lb ai/a	FALL08					
	AMS	100	SG	2.5	lb ai/a	FALL08					
3	flumioxazin	51	WDG	0.383	lb ai/a	FALL08	1.0	8.0	10.0	9.3	5.7
	glyphosate	5.5	L	0.43	lb ai/a	FALL08					
	2, 4-D	3.8	L	0.5	lb ai/a	FALL08					
	AMS	100	SG	2.5	lb ai/a	FALL08					
4	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	1.0	10.0	3.7	6.0	10.0
	glyphosate	5.5	L	0.43	lb ai/a	EPRE					
	AMS	100	SG	2.5	lb ai/a	EPRE					
5	flumioxazin	51	WDG	0.383	lb ai/a	LPRE	1.0	10.0	8.0	8.7	7.3
	glyphosate	5.5	L	0.43	lb ai/a	LPRE					
	AMS	100	SG	2.5	lb ai/a	LPRE					
6	flumioxazin	51	WDG	0.256	lb ai/a	LPRE	1.7	10.0	4.7	7.3	10.0
	glyphosate	5.5	L	0.43	lb ai/a	LPRE					
	AMS	100	SG	2.5	lb ai/a	LPRE					
7	saflufenacil	70	WG	0.045	lb ai/a	EPRE	1.0	6.7	5.0	10.0	10.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
8	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	1.0	9.7	8.0	9.7	10.0
	glufosinate	1.67	L	1.02	lb ai/a	EPRE					
9	rimsulfuron	25	DF	0.064	lb ai/a	EPRE	1.0	10.0	7.7	9.3	7.7
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
10	sulfentrazone	4	F	0.375	lb ai/a	EPRE	1.7	10.0	4.3	9.3	10.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
11	mesotrione	4	SC	0.188	lb ai/a	EPRE	1.0	9.7	4.7	9.7	10.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
12	terbacil	80	WP	2.4	lb ai/a	EPRE	1.0	9.7	10.0	10.0	10.0
	glufosinate	1.67	L	1.04	lb ai/a	EPOS					
LSD (P=.05)							0.41	2.06	2.64	2.21	4.00
Standard Deviation							0.24	1.22	1.56	1.30	2.36
CV							21.69	13.08	23.1	15.48	28.34

Weed Control in Apple – Clarksville 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	WHCL	APPLE	LACG	PERG	COLQ
Pest Code											
Description								APPLE			
Rating Date							7/Jul/09	29/Jul/09	29/Jul/09	29/Jul/09	29/Jul/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	Untreated					FALL08	7.7	1.0	4.3	3.7	5.7
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
2	glyphosate	5.5	L	0.43	lb ai/a	FALL08	5.0	1.0	10.0	8.3	6.7
	2, 4-D	3.8	L	0.5	lb ai/a	FALL08					
	AMS	100	SG	2.5	lb ai/a	FALL08					
3	flumioxazin	51	WDG	0.383	lb ai/a	FALL08	8.7	1.0	4.7	9.7	9.3
	glyphosate	5.5	L	0.43	lb ai/a	FALL08					
	2, 4-D	3.8	L	0.5	lb ai/a	FALL08					
	AMS	100	SG	2.5	lb ai/a	FALL08					
4	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	4.3	1.0	9.7	3.7	10.0
	glyphosate	5.5	L	0.43	lb ai/a	EPRE					
	AMS	100	SG	2.5	lb ai/a	EPRE					
5	flumioxazin	51	WDG	0.383	lb ai/a	LPRE	9.7	1.3	10.0	6.3	10.0
	glyphosate	5.5	L	0.43	lb ai/a	LPRE					
	AMS	100	SG	2.5	lb ai/a	LPRE					
6	flumioxazin	51	WDG	0.256	lb ai/a	LPRE	9.0	1.3	10.0	4.7	10.0
	glyphosate	5.5	L	0.43	lb ai/a	LPRE					
	AMS	100	SG	2.5	lb ai/a	LPRE					
7	saflufenacil	70	WG	0.045	lb ai/a	EPRE	9.3	2.0	6.7	4.0	8.3
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
8	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	10.0	1.0	9.3	7.7	10.0
	glufosinate	1.67	L	1.02	lb ai/a	EPRE					
9	rimsulfuron	25	DF	0.064	lb ai/a	EPRE	8.7	1.0	7.3	6.7	8.3
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
10	sulfentrazone	4	F	0.375	lb ai/a	EPRE	8.7	1.3	8.7	4.7	10.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
11	mesotrione	4	SC	0.188	lb ai/a	EPRE	10.0	1.7	8.7	4.3	10.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
12	terbacil	80	WP	2.4	lb ai/a	EPRE	10.0	1.0	10.0	10.0	10.0
	glufosinate	1.67	L	1.04	lb ai/a	EPOS					
LSD (P=.05)							3.22	0.54	2.91	2.95	2.73
Standard Deviation							1.90	0.32	1.72	1.74	1.61
CV							22.59	26.33	20.76	28.42	17.85

Weed Control in Apple – Clarksville 2009

Dept. of Horticulture, MSU

Pest Code							HOWE	PRKW	RRPW	WHCL	
Description											APPLE
Rating Date							29/Jul/09	29/Jul/09	29/Jul/09	29/Jul/09	4/Sep/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	Untreated					FALL08	8.7	7.7	6.3	3.0	1.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
2	glyphosate	5.5	L	0.43	lb ai/a	FALL08	1.7	3.3	10.0	7.3	1.3
	2, 4-D	3.8	L	0.5	lb ai/a	FALL08					
	AMS	100	SG	2.5	lb ai/a	FALL08					
3	flumioxazin	51	WDG	0.383	lb ai/a	FALL08	8.0	6.3	10.0	8.7	1.7
	glyphosate	5.5	L	0.43	lb ai/a	FALL08					
	2, 4-D	3.8	L	0.5	lb ai/a	FALL08					
	AMS	100	SG	2.5	lb ai/a	FALL08					
4	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	5.0	9.3	10.0	6.0	1.3
	glyphosate	5.5	L	0.43	lb ai/a	EPRE					
	AMS	100	SG	2.5	lb ai/a	EPRE					
5	flumioxazin	51	WDG	0.383	lb ai/a	LPRE	7.3	5.7	9.7	10.0	1.3
	glyphosate	5.5	L	0.43	lb ai/a	LPRE					
	AMS	100	SG	2.5	lb ai/a	LPRE					
6	flumioxazin	51	WDG	0.256	lb ai/a	LPRE	6.0	10.0	10.0	9.3	1.3
	glyphosate	5.5	L	0.43	lb ai/a	LPRE					
	AMS	100	SG	2.5	lb ai/a	LPRE					
7	saflufenacil	70	WG	0.045	lb ai/a	EPRE	9.0	9.0	7.7	8.3	1.7
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
8	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	10.0	9.3	8.7	10.0	1.0
	glufosinate	1.67	L	1.02	lb ai/a	EPRE					
9	rimsulfuron	25	DF	0.064	lb ai/a	EPRE	7.7	7.3	9.7	9.3	1.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
10	sulfentrazone	4	F	0.375	lb ai/a	EPRE	9.7	10.0	10.0	6.3	1.7
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
11	mesotrione	4	SC	0.188	lb ai/a	EPRE	10.0	10.0	9.3	9.7	1.7
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
12	terbacil	80	WP	2.4	lb ai/a	EPRE	10.0	10.0	8.0	10.0	1.0
	glufosinate	1.67	L	1.04	lb ai/a	EPOS					
LSD (P=.05)							2.73	4.29	1.86	3.11	1.09
Standard Deviation							1.61	2.54	1.10	1.83	0.65
CV							20.8	31.05	12.07	22.46	48.41

Weed Control in Apple – Clarksville 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	LACG	PERG	COGR	DAND	HOWE
Pest Code							LACG	PERG	COGR	DAND	HOWE
Description											
Rating Date							4/Sep/09	4/Sep/09	4/Sep/09	4/Sep/09	4/Sep/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	Untreated					FALL08	2.3	6.3	7.7	3.0	8.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
2	glyphosate	5.5	L	0.43	lb ai/a	FALL08	9.7	8.7	10.0	9.3	2.7
	2, 4-D	3.8	L	0.5	lb ai/a	FALL08					
	AMS	100	SG	2.5	lb ai/a	FALL08					
3	flumioxazin	51	WDG	0.383	lb ai/a	FALL08	2.0	9.0	9.7	7.7	8.7
	glyphosate	5.5	L	0.43	lb ai/a	FALL08					
	2, 4-D	3.8	L	0.5	lb ai/a	FALL08					
	AMS	100	SG	2.5	lb ai/a	FALL08					
4	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	9.0	4.7	10.0	9.0	4.0
	glyphosate	5.5	L	0.43	lb ai/a	EPRE					
	AMS	100	SG	2.5	lb ai/a	EPRE					
5	flumioxazin	51	WDG	0.383	lb ai/a	LPRE	9.3	6.7	10.0	9.0	6.0
	glyphosate	5.5	L	0.43	lb ai/a	LPRE					
	AMS	100	SG	2.5	lb ai/a	LPRE					
6	flumioxazin	51	WDG	0.256	lb ai/a	LPRE	9.7	4.3	10.0	9.3	4.7
	glyphosate	5.5	L	0.43	lb ai/a	LPRE					
	AMS	100	SG	2.5	lb ai/a	LPRE					
7	saflufenacil	70	WG	0.045	lb ai/a	EPRE	4.7	3.0	9.7	6.0	7.7
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
8	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	8.3	7.7	10.0	9.3	9.3
	glufosinate	1.67	L	1.02	lb ai/a	EPRE					
9	rimsulfuron	25	DF	0.064	lb ai/a	EPRE	4.0	5.7	6.3	7.0	6.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
10	sulfentrazone	4	F	0.375	lb ai/a	EPRE	8.0	2.0	9.7	2.3	9.3
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
11	mesotrione	4	SC	0.188	lb ai/a	EPRE	7.7	3.3	9.7	6.3	9.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
12	terbacil	80	WP	2.4	lb ai/a	EPRE	10.0	10.0	1.7	10.0	10.0
	glufosinate	1.67	L	1.04	lb ai/a	EPOS					
LSD (P=.05)							3.87	3.01	2.54	3.72	3.30
Standard Deviation							2.28	1.77	1.50	2.20	1.95
CV							32.35	29.85	17.27	29.88	27.44

Weed Control in Apple – New Herbicides HTRC 2009

Project Code: WC 128-09-03 **Location: East Lansing, MI**
Block 153, 154, 159, 160

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Apple **Variety: Gala, Fugi, Luckyjon, Honeycrisp**
Planting Method: Transplant **Planting Date: 2006**
Spacing: 12 FT **Row Spacing: 18 FT**
Tillage Type: None **Study Design: RCB** **Replications: 4**
Plot Size: 11 ft wide x 48 ft long

Soil Type: Marlette Fine Sandy Loam **OM: 2.1%** **pH: 6.8**
Sand: 54.8% **Silt: 34.5%** **Clay: 10.7%** **CEC: 6.5**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
EPRE	4/23/09	10:30 am	42/47	F	Wet	2-3 SW	47	0% Cloudy	N
EPOS	6/10/09	1:45 pm	76/65	F	Moist	1-3 SE	47	75% Cloudy	N
LPOS	7/10/09	10:30 am	80/67	F	Dry	1-3 SW	61	100% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/23	APPLE		Small Bud	
4/23	ANBG = annual bluegrass			Moderate
4/23	CUDO = curly dock			Moderate
4/23	DAND = dandelion			Moderate
4/23	HOWE = horseweed (marestail)			Few
4/23	RESO = red sorrel			Few
4/23	WHCA = white campion			Few
4/23	YERO = yellow rocket			Moderate
6/10	APPLE		Small Green Fruit	
6/10	ANBG = annual bluegrass	3-6″		Many
6/10	CUDO = curly dock	6-10″		Few
6/10	DAND = dandelion	6-12″		Many
6/10	HOWE = horseweed (marestail)	2-3″		Many
6/10	RESO = red sorrel	4-8″		Many
6/10	ROFB = rough fleabane	2-3″		Moderate
6/10	WHCA = white campion	4-6″		Many
6/10	YERO = yellow rocket	1-2″		Moderate
7/10	APPLE	2-3″	Fruit	
7/10	ANBG = annual bluegrass	5-8″		Many
7/10	CUDO = curly dock	10-14″		Moderate
7/10	DAND = dandelion	6-10″		Few
7/10	HOWE = horseweed	2-3″		Moderate
7/10	RESO = red sorrel	6-8″		Moderate
7/10	ROFB = rough fleabane			Few
7/10	WHCA = white campion	2-3″		Few
7/10	YERO = yellow rocket	2-3″		Moderate

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer. One pass on each side of row.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. Keep plot clean with mowing.
4. This is a 2 year experiment. Reapply treatments in 2010.

Weed Control in Apple – New Herbicides HTRC 2009

Dept. of Horticulture, MSU

Trial ID: 128-09-03 Study Director: Dr. Bernard Zandstra
Location: CHES Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	APPLE	ANBG	DAND	ROFB
Pest Code										
Description							APPLE			
Rating Date							12/May/2009	12/May/2009	12/May/2009	12/May/2009
Rating Data Type							RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10
1	Untreated						1.0	4.5	1.5	4.8
	glyphosate	5.5	L	0.43	lb ai/a	EPRE				
	glyphosate	5.5	L	0.43	lb ai/a	EPOS				
	glyphosate	5.5	L	0.43	lb ai/a	LPOS				
2	saflufenacil	70	WG	0.09	lb ai/a	ALL	1.0	1.5	5.5	6.8
	COC	100	SL	1	% v/v	ALL				
	Ammonium Sulfate	100	SG	3	lb ai/a	ALL				
3	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	1.0	9.8	6.3	5.8
	glyphosate	5.5	L	0.43	lb ai/a	EPOS				
	glyphosate	5.5	L	0.43	lb ai/a	LPOS				
4	rimsulfuron	25	DF	0.063	lb ai/a	EPRE	1.0	6.3	7.8	6.8
	glyphosate	5.5	L	0.43	lb ai/a	EPOS				
	glyphosate	5.5	L	0.43	lb ai/a	LPOS				
5	sulfentrazone	4	F	0.375	lb ai/a	EPRE	1.0	5.8	1.5	3.8
	glyphosate	5.5	L	0.43	lb ai/a	EPOS				
	glyphosate	5.5	L	0.43	lb ai/a	LPOS				
6	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	1.0	7.0	2.3	1.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS				
	glyphosate	5.5	L	0.43	lb ai/a	LPOS				
LSD (P=.05)							0.00	2.82	2.40	5.24
Standard Deviation							0.00	1.87	1.59	3.48
CV							0.0	32.29	38.65	72.62

Weed Control in Apple – New Herbicides HTRC 2009

Dept. of Horticulture, MSU

Pest Code							WICA	YERO		QUGR	ALFA
Description									APPLE		
Rating Date							12/May/2009	12/May/2009	1/Jun/2009	1/Jun/2009	1/Jun/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	Untreated						7.8	6.0	1.0	10.0	1.5
	glyphosate	5.5	L	0.43	lb ai/a	EPRE					
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
	glyphosate	5.5	L	0.43	lb ai/a	LPOS					
2	saflufenacil	70	WG	0.09	lb ai/a	ALL	7.5	9.8	1.0	5.5	6.0
	COC	100	SL	1	% v/v	ALL					
	Ammonium Sulfate	100	SG	3	lb ai/a	ALL					
3	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	6.5	10.0	1.0	10.0	7.3
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
	glyphosate	5.5	L	0.43	lb ai/a	LPOS					
4	rimsulfuron	25	DF	0.063	lb ai/a	EPRE	8.0	5.3	1.0	10.0	3.8
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
	glyphosate	5.5	L	0.43	lb ai/a	LPOS					
5	sulfentrazone	4	F	0.375	lb ai/a	EPRE	7.8	4.8	1.0	7.5	2.3
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
	glyphosate	5.5	L	0.43	lb ai/a	LPOS					
6	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	7.8	1.0	1.0	8.3	5.8
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
	glyphosate	5.5	L	0.43	lb ai/a	LPOS					
LSD (P=.05)							4.75	3.71	0.00	3.85	2.89
Standard Deviation							3.15	2.46	0.00	2.56	1.92
CV							41.76	40.17	0.0	29.92	43.42

Pest Code							BHPL	CUDO	DAND	RECL	RESO
Description											
Rating Date							1/Jun/2009	1/Jun/2009	1/Jun/2009	1/Jun/2009	1/Jun/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	Untreated						5.8	1.8	1.8	4.5	7.8
	glyphosate	5.5	L	0.43	lb ai/a	EPRE					
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
	glyphosate	5.5	L	0.43	lb ai/a	LPOS					
2	saflufenacil	70	WG	0.09	lb ai/a	ALL	7.5	1.5	3.0	6.8	6.3
	COC	100	SL	1	% v/v	ALL					
	Ammonium Sulfate	100	SG	3	lb ai/a	ALL					
3	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	9.5	4.3	2.0	3.3	7.8
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
	glyphosate	5.5	L	0.43	lb ai/a	LPOS					
4	rimsulfuron	25	DF	0.063	lb ai/a	EPRE	8.3	1.5	8.0	8.3	3.3
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
	glyphosate	5.5	L	0.43	lb ai/a	LPOS					
5	sulfentrazone	4	F	0.375	lb ai/a	EPRE	9.0	3.8	3.0	1.8	9.8
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
	glyphosate	5.5	L	0.43	lb ai/a	LPOS					
6	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	10.0	1.5	5.5	4.3	2.8
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
	glyphosate	5.5	L	0.43	lb ai/a	LPOS					
LSD (P=.05)							3.80	1.88	2.18	3.49	6.12
Standard Deviation							2.52	1.25	1.44	2.31	4.06
CV							30.23	52.65	37.27	48.28	65.01

Weed Control in Apple – New Herbicides HTRC 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	WICA	WHCA	APPLE	QUGR	TAFE
Pest Code							WICA	WHCA		QUGR	TAFE
Description									APPLE		
Rating Date							1/Jun/2009	1/Jun/2009	9/Jul/2009	9/Jul/2009	9/Jul/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	Untreated						7.8	10.0	1.0	9.8	8.3
	glyphosate	5.5	L	0.43	lb ai/a	EPRE					
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
	glyphosate	5.5	L	0.43	lb ai/a	LPOS					
2	saflufenacil	70	WG	0.09	lb ai/a	ALL	7.8	5.3	1.0	9.0	7.3
	COC	100	SL	1	% v/v	ALL					
	Ammonium Sulfate	100	SG	3	lb ai/a	ALL					
3	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	7.5	9.3	1.0	9.0	7.5
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
	glyphosate	5.5	L	0.43	lb ai/a	LPOS					
4	rimsulfuron	25	DF	0.063	lb ai/a	EPRE	10.0	2.3	1.0	9.5	7.3
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
	glyphosate	5.5	L	0.43	lb ai/a	LPOS					
5	sulfentrazone	4	F	0.375	lb ai/a	EPRE	8.0	2.3	1.0	9.5	8.8
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
	glyphosate	5.5	L	0.43	lb ai/a	LPOS					
6	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	7.8	6.5	1.0	9.3	7.8
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
	glyphosate	5.5	L	0.43	lb ai/a	LPOS					
LSD (P=.05)							5.69	3.67	0.00	1.30	1.80
Standard Deviation							3.78	2.44	0.00	0.86	1.19
CV							46.5	41.21	0.0	9.24	15.29

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	BFTF	DAND	ROFB	WICA	APPLE
Pest Code							BFTF	DAND	ROFB	WICA	
Description											APPLE
Rating Date							9/Jul/2009	9/Jul/2009	9/Jul/2009	9/Jul/2009	24/Aug/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	Untreated						2.3	3.0	6.5	9.3	1.0
	glyphosate	5.5	L	0.43	lb ai/a	EPRE					
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
	glyphosate	5.5	L	0.43	lb ai/a	LPOS					
2	saflufenacil	70	WG	0.09	lb ai/a	ALL	8.3	7.8	8.8	8.0	1.3
	COC	100	SL	1	% v/v	ALL					
	Ammonium Sulfate	100	SG	3	lb ai/a	ALL					
3	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	3.8	3.3	5.3	9.5	1.3
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
	glyphosate	5.5	L	0.43	lb ai/a	LPOS					
4	rimsulfuron	25	DF	0.063	lb ai/a	EPRE	3.0	4.8	8.3	9.5	1.5
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
	glyphosate	5.5	L	0.43	lb ai/a	LPOS					
5	sulfentrazone	4	F	0.375	lb ai/a	EPRE	3.0	3.5	6.3	7.0	1.5
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
	glyphosate	5.5	L	0.43	lb ai/a	LPOS					
6	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	5.0	3.3	4.0	8.8	1.5
	glyphosate	5.5	L	0.43	lb ai/a	EPOS					
	glyphosate	5.5	L	0.43	lb ai/a	LPOS					
LSD (P=.05)							2.88	2.14	2.92	3.34	1.24
Standard Deviation							1.91	1.42	1.94	2.21	0.82
CV							45.42	33.37	29.81	25.54	61.75

Weed Control in Apple – New Herbicides HTRC 2009

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Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	BFTF	DAND	WICA
Pest Code							BFTF	DAND	WICA
Description									
Rating Date							24/Aug/2009	24/Aug/2009	24/Aug/2009
Rating Data Type							RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10
1	Untreated						1.5	2.8	9.0
	glyphosate	5.5	L	0.43	lb ai/a	EPRE			
	glyphosate	5.5	L	0.43	lb ai/a	EPOS			
	glyphosate	5.5	L	0.43	lb ai/a	LPOS			
2	saflufenacil	70	WG	0.09	lb ai/a	ALL	9.5	6.3	8.8
	COC	100	SL	1	% v/v	ALL			
	Ammonium Sulfate	100	SG	3	lb ai/a	ALL			
3	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	3.3	4.8	6.8
	glyphosate	5.5	L	0.43	lb ai/a	EPOS			
	glyphosate	5.5	L	0.43	lb ai/a	LPOS			
4	rimsulfuron	25	DF	0.063	lb ai/a	EPRE	2.8	5.3	9.0
	glyphosate	5.5	L	0.43	lb ai/a	EPOS			
	glyphosate	5.5	L	0.43	lb ai/a	LPOS			
5	sulfentrazone	4	F	0.375	lb ai/a	EPRE	1.8	3.3	8.3
	glyphosate	5.5	L	0.43	lb ai/a	EPOS			
	glyphosate	5.5	L	0.43	lb ai/a	LPOS			
6	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	3.8	4.3	8.8
	glyphosate	5.5	L	0.43	lb ai/a	EPOS			
	glyphosate	5.5	L	0.43	lb ai/a	LPOS			
LSD (P=.05)							2.15	2.45	3.27
Standard Deviation							1.43	1.63	2.17
CV							38.03	36.82	25.82

Weed Control in Apple with Pruven Herbicide – HTRC 2009

Project Code: WC 128-09-07 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Apple **Variety: Liberty, Empire, Ida Red**
Planting Method: Transplant **Planting Date: 2005**
Spacing: 4 FT **Row Spacing: 18 FT**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 11 ft wide x 50 ft long

Soil Type: Marlette Fine Sandy Loam **OM: 2.1%** **pH: 6.8**
Sand: 59.8% **Silt: 24.8%** **Clay: 15.4%** **CEC: 6.3**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
EPOS	6/8/09	3:00 pm	75/65	F	Wet	1-5 SE	80	100% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
6/8	APPLE		Small Fruit	
6/8	DAND = dandelion	6-12″		Many
6/8	ROFB = rough fleabane	12-15″		Moderate
6/8	WHCA = white campion	12-14″		Many
6/8	WICA = wild carrot	2-4″		Many

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. All treatments mowed to 6″ before application

Weed Control in Apple with Pruven Herbicide – HTRC 2009

Dept. of Horticulture, MSU

Trial ID: 128-09-07 Study Director: Dr. Bernard Zandstra
Location: HTRC – East Lansing Investigator: Rodney Tocco

Pest Code								TAFE	BFTF	BHPL	DAND	ROFB
Description							Apple					
Rating Date							9/Jul/2009	9/Jul/2009	9/Jul/2009	9/Jul/2009	9/Jul/2009	9/Jul/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage						
1	rimsulfuron (P)	25	DF	0.031	lb ai/a	EPOS	1.0	6.7	3.3	2.7	5.3	6.3
	glyphosate	5.5	L	0.7	lb ai/a	EPOS						
	NIS	100	SL	0.5	% v/v	EPOS						
2	rimsulfuron (M)	25	DF	0.031	lb ai/a	EPOS	1.0	5.3	7.7	5.7	3.3	4.3
	glyphosate	5.5	L	0.7	lb ai/a	EPOS						
	NIS	100	SL	0.5	% v/v	EPOS						
3	rimsulfuron (P)	25	DF	0.063	lb ai/a	EPOS	1.0	4.7	7.3	4.0	2.7	2.7
	glyphosate	5.5	L	0.7	lb ai/a	EPOS						
	NIS	100	SL	0.5	% v/v	EPOS						
4	rimsulfuron (M)	25	DF	0.063	lb ai/a	EPOS	1.0	5.0	5.3	1.7	5.0	5.7
	glyphosate	5.5	L	0.7	lb ai/a	EPOS						
	NIS	100	SL	0.5	% v/v	EPOS						
5	rimsulfuron (P)	25	DF	0.125	lb ai/a	EPOS	1.0	8.0	7.3	3.7	3.3	7.7
	glyphosate	5.5	L	0.7	lb ai/a	EPOS						
	NIS	100	SL	0.5	% v/v	EPOS						
6	rimsulfuron (M)	25	DF	0.125	lb ai/a	EPOS	1.0	7.3	4.3	1.7	5.7	7.7
	glyphosate	5.5	L	0.7	lb ai/a	EPOS						
	NIS	100	SL	0.5	% v/v	EPOS						
7	flumioxazin	51	WDG	0.383	lb ai/a	EPOS	1.0	6.7	4.7	6.0	4.7	5.0
	glyphosate	5.5	L	0.7	lb ai/a	EPOS						
	NIS	100	SL	0.5	% v/v	EPOS						
8	Untreated					EPOS	1.0	3.3	3.7	1.0	1.3	5.7
LSD (P=.05)							0.00	4.70	6.57	3.27	3.35	6.38
Standard Deviation							0.00	2.68	3.75	1.87	1.91	3.64
CV							0.0	45.66	68.72	56.69	48.77	64.74

Weed Control in Apple with Pruven Herbicide – HTRC 2009

Dept. of Horticulture, MSU

Pest Code							WHCA	WICA		YEFT	ALFA
Description									Apple		
Rating Date							9/Jul/2009	9/Jul/2009	24/Aug/2009	24/Aug/2009	24/Aug/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	rimsulfuron (P)	25	DF	0.031	lb ai/a	EPOS	3.3	4.7	1.0	6.3	9.0
	glyphosate	5.5	L	0.7	lb ai/a	EPOS					
	NIS	100	SL	0.5	% v/v	EPOS					
2	rimsulfuron (M)	25	DF	0.031	lb ai/a	EPOS	7.0	7.7	1.7	9.3	8.7
	glyphosate	5.5	L	0.7	lb ai/a	EPOS					
	NIS	100	SL	0.5	% v/v	EPOS					
3	rimsulfuron (P)	25	DF	0.063	lb ai/a	EPOS	5.0	3.7	1.7	9.3	7.0
	glyphosate	5.5	L	0.7	lb ai/a	EPOS					
	NIS	100	SL	0.5	% v/v	EPOS					
4	rimsulfuron (M)	25	DF	0.063	lb ai/a	EPOS	1.7	3.3	1.7	7.7	6.0
	glyphosate	5.5	L	0.7	lb ai/a	EPOS					
	NIS	100	SL	0.5	% v/v	EPOS					
5	rimsulfuron (P)	25	DF	0.125	lb ai/a	EPOS	3.3	8.0	2.7	9.7	6.3
	glyphosate	5.5	L	0.7	lb ai/a	EPOS					
	NIS	100	SL	0.5	% v/v	EPOS					
6	rimsulfuron (M)	25	DF	0.125	lb ai/a	EPOS	4.7	4.7	1.7	9.3	8.3
	glyphosate	5.5	L	0.7	lb ai/a	EPOS					
	NIS	100	SL	0.5	% v/v	EPOS					
7	flumioxazin	51	WDG	0.383	lb ai/a	EPOS	8.3	1.3	1.0	9.7	6.3
	glyphosate	5.5	L	0.7	lb ai/a	EPOS					
	NIS	100	SL	0.5	% v/v	EPOS					
8	Untreated					EPOS	2.3	2.3	1.0	7.7	6.3
LSD (P=.05)							3.68	4.55	1.34	4.34	3.81
Standard Deviation							2.10	2.60	0.77	2.48	2.18
CV							47.07	58.22	49.79	28.75	30.02

Weed Control in Apple with Pruven Herbicide – HTRC 2009

Dept. of Horticulture, MSU

Pest Code							BFTF	BHPL	DAND	ROFB	WICA
Description											
Rating Date							24/Aug/2009	24/Aug/2009	24/Aug/2009	24/Aug/2009	24/Aug/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	rimsulfuron (P)	25	DF	0.031	lb ai/a	EPOS	3.0	4.7	4.3	4.7	5.0
	glyphosate	5.5	L	0.7	lb ai/a	EPOS					
	NIS	100	SL	0.5	% v/v	EPOS					
2	rimsulfuron (M)	25	DF	0.031	lb ai/a	EPOS	4.7	2.7	1.7	1.3	7.3
	glyphosate	5.5	L	0.7	lb ai/a	EPOS					
	NIS	100	SL	0.5	% v/v	EPOS					
3	rimsulfuron (P)	25	DF	0.063	lb ai/a	EPOS	6.7	4.7	3.0	2.0	4.7
	glyphosate	5.5	L	0.7	lb ai/a	EPOS					
	NIS	100	SL	0.5	% v/v	EPOS					
4	rimsulfuron (M)	25	DF	0.063	lb ai/a	EPOS	3.0	3.3	3.3	6.3	3.7
	glyphosate	5.5	L	0.7	lb ai/a	EPOS					
	NIS	100	SL	0.5	% v/v	EPOS					
5	rimsulfuron (P)	25	DF	0.125	lb ai/a	EPOS	5.0	3.7	3.0	4.0	6.0
	glyphosate	5.5	L	0.7	lb ai/a	EPOS					
	NIS	100	SL	0.5	% v/v	EPOS					
6	rimsulfuron (M)	25	DF	0.125	lb ai/a	EPOS	2.3	3.0	4.3	5.3	5.0
	glyphosate	5.5	L	0.7	lb ai/a	EPOS					
	NIS	100	SL	0.5	% v/v	EPOS					
7	flumioxazin	51	WDG	0.383	lb ai/a	EPOS	1.7	5.0	4.3	3.7	1.3
	glyphosate	5.5	L	0.7	lb ai/a	EPOS					
	NIS	100	SL	0.5	% v/v	EPOS					
8	Untreated					EPOS	3.7	5.0	3.3	6.0	3.3
LSD (P=.05)							5.39	3.07	3.26	3.06	3.38
Standard Deviation							3.08	1.75	1.86	1.75	1.93
CV							82.06	43.86	54.43	41.94	42.54

Weed Control in Apple with Treevix – HTRC 2009

Project Code: WC 128-09-02 **Location: East Lansing, MI**
Block 153, 154, 159, 160

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Apple **Variety: Luckyjon, Spartan, Gala, Honey Crisp**
Planting Method: Transplant **Planting Date: 2006**
Spacing: 12 FT **Row Spacing: 18 FT**
Tillage Type: None **Study Design: RCB** **Replications: 3**
Plot Size: 11 ft wide x 48 ft long

Soil Type: Marlette Fine Sandy Loam **OM: 2.1%** **pH: 6.8**
Sand: 54.8% **Silt: 34.5%** **Clay: 10.7%** **CEC: 6.5**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
LPRE	4/23/09	9:30 am	41/47	F	Wet	2-3 SW	45	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/23	APPLE		Small Bud	
4/23	BHPL = buckhorn plantain			Few
4/23	DAND = dandelion			Few
4/23	WICA = wild carrot			Moderate
4/23	YERO = yellow rocket			Many

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer. One pass on each side of the row.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. Plots maintained with mowing.

Weed Control in Apple with Treevix – HTRC 2009

Dept. of Horticulture, MSU

Trial ID: 128-09-02 Study Director: Dr. Bernard Zandstra
Location: East Lansing, MI Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	APPLE	ANBG	TAFE	DAND
Pest Code								ANBG	TAFE	DAND
Description							APPLE			
Rating Date							12/May/09	12/May/09	12/May/09	12/May/09
Rating Data Type							RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10
1	Untreated						1.0	1.0	1.3	1.0
2	glyphosate	4	L	1	lb ai/a	LPRE	1.0	9.3	9.0	8.0
	NIS	100	SL	0.25	% v/v	LPRE				
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE				
3	saflufenacil	70	WG	0.033	lb ai/a	LPRE	1.0	8.7	9.0	8.3
	glyphosate	4	L	1	lb ai/a	LPRE				
	COC	100	SL	1	% v/v	LPRE				
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE				
4	saflufenacil	70	WG	0.045	lb ai/a	LPRE	1.0	9.0	9.7	8.0
	glyphosate	4	L	1	lb ai/a	LPRE				
	COC	100	SL	1	% v/v	LPRE				
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE				
5	saflufenacil	70	WG	0.045	lb ai/a	LPRE	1.0	9.7	10.0	7.3
	pendimethalin	3.8	CS	1.9	lb ai/a	LPRE				
	glyphosate	4	L	1	lb ai/a	LPRE				
	COC	100	SL	1	% v/v	LPRE				
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE				
6	rimsulfuron	25	DF	0.063	lb ai/a	LPRE	1.0	8.3	9.3	8.0
	glyphosate	4	L	1	lb ai/a	LPRE				
	COC	100	SL	1	% v/v	LPRE				
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE				
7	diuron	80	WP	3	lb ai/a	LPRE	1.0	9.3	8.7	6.0
	glyphosate	4	L	1	lb ai/a	LPRE				
	NIS	100	SL	0.25	% v/v	LPRE				
8	saflufenacil	70	WG	0.135	lb ai/a	LPRE	1.0	7.7	9.3	9.0
	glyphosate	4	L	1	lb ai/a	LPRE				
	COC	100	SL	1	% v/v	LPRE				
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE				
LSD (P=.05)							0.00	1.70	1.53	2.03
Standard Deviation							0.00	0.97	0.88	1.16
CV							0.0	12.35	10.57	16.63

Weed Control in Apple with Treevix – HTRC 2009

Dept. of Horticulture, MSU

Pest Code							RECL	WICA	YERO		QUGR
Description										APPLE	
Rating Date							12/May/09	12/May/09	12/May/09	1/Jun/09	1/Jun/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	Untreated						1.0	1.0	1.0	1.0	1.7
2	glyphosate	4	L	1	lb ai/a	LPRE	9.7	6.7	10.0	1.0	9.7
	NIS	100	SL	0.25	% v/v	LPRE					
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE					
3	saflufenacil	70	WG	0.033	lb ai/a	LPRE	8.0	7.0	10.0	1.0	10.0
	glyphosate	4	L	1	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE					
4	saflufenacil	70	WG	0.045	lb ai/a	LPRE	9.0	6.7	10.0	1.0	10.0
	glyphosate	4	L	1	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE					
5	saflufenacil	70	WG	0.045	lb ai/a	LPRE	9.3	5.3	10.0	1.0	10.0
	pendimethalin	3.8	CS	1.9	lb ai/a	LPRE					
	glyphosate	4	L	1	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE					
6	rimsulfuron	25	DF	0.063	lb ai/a	LPRE	9.0	8.0	10.0	1.0	10.0
	glyphosate	4	L	1	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE					
7	diuron	80	WP	3	lb ai/a	LPRE	9.7	2.3	9.3	1.0	10.0
	glyphosate	4	L	1	lb ai/a	LPRE					
	NIS	100	SL	0.25	% v/v	LPRE					
8	saflufenacil	70	WG	0.135	lb ai/a	LPRE	9.3	6.0	10.0	1.0	10.0
	glyphosate	4	L	1	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE					
LSD (P=.05)							1.55	2.91	0.72	0.00	0.78
Standard Deviation							0.88	1.66	0.41	0.00	0.44
CV							10.87	30.92	4.64	0.0	4.97

Weed Control in Apple with Treevix – HTRC 2009

Dept. of Horticulture, MSU

Pest Code							ALFA	BHPL	DAND	RECL	WHCA
Description											
Rating Date							1/Jun/09	1/Jun/09	1/Jun/09	1/Jun/09	1/Jun/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	Untreated						1.7	1.0	1.7	4.0	1.0
2	glyphosate	4	L	1	lb ai/a	LPRE	3.7	6.0	9.3	8.7	8.7
	NIS	100	SL	0.25	% v/v	LPRE					
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE					
3	saflufenacil	70	WG	0.033	lb ai/a	LPRE	4.7	7.3	7.3	9.0	6.7
	glyphosate	4	L	1	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE					
4	saflufenacil	70	WG	0.045	lb ai/a	LPRE	2.7	6.3	7.0	9.7	5.3
	glyphosate	4	L	1	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE					
5	saflufenacil	70	WG	0.045	lb ai/a	LPRE	4.0	4.3	4.7	10.0	9.0
	pendimethalin	3.8	CS	1.9	lb ai/a	LPRE					
	glyphosate	4	L	1	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE					
6	rimsulfuron	25	DF	0.063	lb ai/a	LPRE	6.7	4.3	9.3	9.7	7.7
	glyphosate	4	L	1	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE					
7	diuron	80	WP	3	lb ai/a	LPRE	3.3	6.0	4.7	10.0	8.7
	glyphosate	4	L	1	lb ai/a	LPRE					
	NIS	100	SL	0.25	% v/v	LPRE					
8	saflufenacil	70	WG	0.135	lb ai/a	LPRE	3.3	5.3	7.0	10.0	10.0
	glyphosate	4	L	1	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE					
LSD (P=.05)							4.21	4.56	2.84	3.43	3.76
Standard Deviation							2.40	2.60	1.62	1.96	2.15
CV							64.11	51.24	25.41	22.08	30.14

Weed Control in Apple with Treevix – HTRC 2009

Dept. of Horticulture, MSU

Pest Code							WICA		TAFE	ALFA	BFTF	BHPL
Description								APPLE				
Rating Date							1/Jun/09	9/Jul/09	9/Jul/09	9/Jul/09	9/Jul/09	9/Jul/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage						
1	Untreated						1.0	1.0	2.0	1.7	2.7	2.0
2	glyphosate	4	L	1	lb ai/a	LPRE	4.0	1.0	7.3	2.7	3.7	3.0
	NIS	100	SL	0.25	% v/v	LPRE						
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE						
3	saflufenacil	70	WG	0.033	lb ai/a	LPRE	1.7	1.0	7.3	6.0	3.7	3.3
	glyphosate	4	L	1	lb ai/a	LPRE						
	COC	100	SL	1	% v/v	LPRE						
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE						
4	saflufenacil	70	WG	0.045	lb ai/a	LPRE	2.7	1.0	6.7	5.1	3.7	3.3
	glyphosate	4	L	1	lb ai/a	LPRE						
	COC	100	SL	1	% v/v	LPRE						
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE						
5	saflufenacil	70	WG	0.045	lb ai/a	LPRE	2.3	1.0	7.0	3.0	2.0	2.3
	pendimethalin	3.8	CS	1.9	lb ai/a	LPRE						
	glyphosate	4	L	1	lb ai/a	LPRE						
	COC	100	SL	1	% v/v	LPRE						
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE						
6	rimsulfuron	25	DF	0.063	lb ai/a	LPRE	9.3	1.0	8.7	8.3	3.7	1.7
	glyphosate	4	L	1	lb ai/a	LPRE						
	COC	100	SL	1	% v/v	LPRE						
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE						
7	diuron	80	WP	3	lb ai/a	LPRE	2.0	1.0	9.0	4.7	6.3	4.0
	glyphosate	4	L	1	lb ai/a	LPRE						
	NIS	100	SL	0.25	% v/v	LPRE						
8	saflufenacil	70	WG	0.135	lb ai/a	LPRE	1.7	1.0	6.0	1.0	2.7	2.0
	glyphosate	4	L	1	lb ai/a	LPRE						
	COC	100	SL	1	% v/v	LPRE						
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE						
LSD (P=.05)							3.62	0.00	3.97	2.22	4.92	4.08
Standard Deviation							2.07	0.00	2.27	1.26	2.81	2.33
CV							67.0	0.0	33.58	30.96	79.27	86.08

Weed Control in Apple with Treevix – HTRC 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	DAND 9/Jul/09 RATING 1-10	ROFB 9/Jul/09 RATING 1-10	WHCA 9/Jul/09 RATING 1-10	WICA 9/Jul/09 RATING 1-10	Apple 24/Aug/09 RATING 1-10	YEFT 24/Aug/09 RATING 1-10
1	Untreated						1.3	3.3	2.0	1.0	1.0	3.7
2	glyphosate	4	L	1	lb ai/a	LPRE	3.3	6.7	5.7	1.0	1.0	6.3
	NIS	100	SL	0.25	% v/v	LPRE						
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE						
3	saflufenacil	70	WG	0.033	lb ai/a	LPRE	4.0	2.7	2.7	1.3	1.0	2.0
	glyphosate	4	L	1	lb ai/a	LPRE						
	COC	100	SL	1	% v/v	LPRE						
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE						
4	saflufenacil	70	WG	0.045	lb ai/a	LPRE	2.0	7.7	1.7	1.3	1.0	1.0
	glyphosate	4	L	1	lb ai/a	LPRE						
	COC	100	SL	1	% v/v	LPRE						
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE						
5	saflufenacil	70	WG	0.045	lb ai/a	LPRE	2.7	3.0	4.3	1.0	1.0	7.7
	pendimethalin	3.8	CS	1.9	lb ai/a	LPRE						
	glyphosate	4	L	1	lb ai/a	LPRE						
	COC	100	SL	1	% v/v	LPRE						
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE						
6	rimsulfuron	25	DF	0.063	lb ai/a	LPRE	4.7	9.3	7.7	7.7	1.0	6.7
	glyphosate	4	L	1	lb ai/a	LPRE						
	COC	100	SL	1	% v/v	LPRE						
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE						
7	diuron	80	WP	3	lb ai/a	LPRE	2.7	6.3	7.3	1.0	1.0	6.3
	glyphosate	4	L	1	lb ai/a	LPRE						
	NIS	100	SL	0.25	% v/v	LPRE						
8	saflufenacil	70	WG	0.135	lb ai/a	LPRE	4.3	8.7	2.0	1.0	1.0	5.3
	glyphosate	4	L	1	lb ai/a	LPRE						
	COC	100	SL	1	% v/v	LPRE						
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE						
LSD (P=.05)							2.62	3.82	4.55	2.58	0.00	3.77
Standard Deviation							1.49	2.18	2.60	1.47	0.00	2.15
CV							47.81	36.6	62.33	76.9	0.0	44.11

Weed Control in Apple with Treevix – HTRC 2009

Dept. of Horticulture, MSU

Pest Code							ALFA	BFTF	BHPL	DAND	WICA
Description											
Rating Date							24/Aug/09	24/Aug/09	24/Aug/09	24/Aug/09	24/Aug/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	Untreated						1.7	1.0	1.7	3.0	1.7
2	glyphosate	4	L	1	lb ai/a	LPRE	3.7	5.3	4.7	5.7	2.0
	NIS	100	SL	0.25	% v/v	LPRE					
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE					
3	saflufenacil	70	WG	0.033	lb ai/a	LPRE	2.7	1.7	5.7	4.3	2.7
	glyphosate	4	L	1	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE					
4	saflufenacil	70	WG	0.045	lb ai/a	LPRE	4.3	2.0	2.7	2.0	3.7
	glyphosate	4	L	1	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE					
5	saflufenacil	70	WG	0.045	lb ai/a	LPRE	2.3	1.3	7.0	4.7	2.3
	pendimethalin	3.8	CS	1.9	lb ai/a	LPRE					
	glyphosate	4	L	1	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE					
6	rimsulfuron	25	DF	0.063	lb ai/a	LPRE	6.3	4.0	2.7	5.3	6.3
	glyphosate	4	L	1	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE					
7	diuron	80	WP	3	lb ai/a	LPRE	4.0	4.0	4.3	5.7	2.3
	glyphosate	4	L	1	lb ai/a	LPRE					
	NIS	100	SL	0.25	% v/v	LPRE					
8	saflufenacil	70	WG	0.135	lb ai/a	LPRE	3.0	4.0	6.7	5.7	2.3
	glyphosate	4	L	1	lb ai/a	LPRE					
	COC	100	SL	1	% v/v	LPRE					
	Ammonium Sulfate	100	SG	3	lb ai/a	LPRE					
LSD (P=.05)							4.46	3.58	3.49	2.98	3.23
Standard Deviation							2.55	2.04	1.99	1.70	1.84
CV							72.74	70.04	45.11	37.53	63.21

Weed Control in Blueberry – Getzoff Farm 2009

Project Code: WC 127-09-01 **Location: Fennville, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Blueberry **Variety: Rubel**
Planting Method: **Planting Date:**
Spacing: 5 FT **Row Spacing: 10 FT**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 6 ft wide x 40 ft long

Soil Type: Oakville Fine Sand **OM: 4.5%** **pH: 4.5**
Sand: 89.1% **Silt: 8.2%** **Clay: 2.7%** **CEC: 16.5**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
EPRE	4/10/09	11:00 am	62/45	F	Damp	5-7 NW	37	5% Cloudy	N
EPOS	6/11/09	10:00 am	65/61	F	Wet	1 E	80	100% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/10	BLBE = blueberry	5-7′	Dormant	
4/10	COCW = common chickweed			Few
4/10	QUGR = quackgrass			Few
6/11	BLBE = blueberry	5-8′	Green Berry	
6/11	COCW = common chickweed			Many
6/11	HOWE = horseweed	2-3″		Moderate
6/11	PUDN = purple deadnettle	6-12″		Few
6/11	QUGR = quackgrass	6-18″		Many

Notes and Comments
1. Sprays applied with 2 nozzle boom FF11002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. One boom pass on each side of row.
4. All plots mowed prior to 7/15/08 spray.

Weed Control in Blueberry – Getzoff Farm 2009

Trial ID: 127-09-01 Study Director: Dr. Bernard Zandstra
Location: Fennville, MI Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage				
Pest Code								TAFE	COPW	GORO	POIV
Description							BLUEBERRY				
Rating Date							21/May/09	21/May/09	21/May/09	21/May/09	21/May/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	diuron	80	DF	1.6	lb ai/a	EPRE	1.0	7.3	10.0	7.0	10.0
	terbacil	80	WP	1.6	lb ai/a	EPRE					
	glufosinate	1.67	L	1.04	lb ai/a	EPOS					
2	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	1.0	8.7	10.0	4.0	7.0
	glufosinate	1.67	L	1.04	lb ai/a	EPRE					
3	mesotrione	4	SC	0.094	lb ai/a	EPRE	1.0	7.7	7.0	6.3	4.0
	NIS	100	SL	0.25	% v/v	EPRE					
4	mesotrione	4	SC	0.188	lb ai/a	EPRE	1.0	4.3	7.0	10.0	7.0
	NIS	100	SL	0.25	% v/v	EPRE					
5	mesotrione	4	SC	0.188	lb ai/a	EPRE	1.0	5.0	9.0	6.7	10.0
	diuron	80	DF	1.6	lb ai/a	EPRE					
	NIS	100	SL	0.25	% v/v	EPRE					
6	diuron	80	DF	3.2	lb ai/a	EPRE	1.0	5.7	6.3	5.0	10.0
	mesotrione	4	SC	0.188	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
7	oryzalin	4	F	4	lb ai/a	EPRE	1.0	7.3	4.0	4.7	4.0
	simazine	90	WDG	3	lb ai/a	EPRE					
	glyphosate	78	DF	1	lb ai/a	EPRE					
	glyphosate	78	DF	1	lb ai/a	EPOS					
8	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	1.0	7.0	7.0	1.7	10.0
	NIS	100	SL	0.25	% v/v	EPRE					
9	pronamide	50	WP	2	lb ai/a	EPRE	1.0	8.0	10.0	3.7	10.0
	diuron	80	DF	2	lb ai/a	EPRE					
	clopyralid	3	EC	0.25	lb ai/a	EPOS					
	sethoxydim	1.53	EC	0.19	lb ai/a	EPOS					
10	s-metolachlor	7.62	EC	2	lb ai/a	EPRE	1.0	5.7	5.7	6.7	10.0
	mesotrione	4	SC	0.188	lb ai/a	EPRE					
11	oxyfluorfen	4	SC	2	lb ai/a	EPRE	1.0	5.3	4.7	4.0	4.0
12	saflufenacil	70	WG	0.045	lb ai/a	EPRE	1.0	3.7	10.0	7.0	10.0
13	sulfentrazone	4	F	0.375	lb ai/a	EPRE	1.0	5.7	7.7	10.0	7.0
	carfentrazone	2	EC	0.031	lb ai/a	EPRE					
	carfentrazone	2	EC	0.031	lb ai/a	EPOS					
14	rimsulfuron	25	DF	0.064	lb ai/a	EPRE	1.0	9.3	10.0	10.0	10.0
	carfentrazone	2	EC	0.031	lb ai/a	EPOS					
15	halosulfuron	75	WG	0.047	lb ai/a	EPRE	1.0	7.0	10.0	7.0	10.0
	oryzalin	4	F	4	lb ai/a	EPRE					
	glyphosate	78	DF	1	lb ai/a	EPRE					
16	halosulfuron	75	WG	0.047	lb ai/a	EPRE	1.0	8.0	10.0	4.7	10.0
	diuron	80	DF	2	lb ai/a	EPRE					
17	halosulfuron	75	WG	0.047	lb ai/a	EPRE	1.0	5.7	10.0	6.7	10.0
	simazine	90	WDG	2	lb ai/a	EPRE					
18	halosulfuron	75	WG	0.047	lb ai/a	EPOS	1.3	2.3	7.0	7.7	10.0
	carfentrazone	2	EC	0.031	lb ai/a	EPOS					
	sethoxydim	1.53	EC	0.19	lb ai/a	EPOS					
	COC	100	SL	1	% v/v	EPOS					
	Ammonium Sulfate	100	SG	3	lb ai/a	EPOS					
19	hexazinone	2	L	1	lb ai/a	EPRE	1.7	6.3	10.0	4.0	9.7
20	Untreated					EPRE	1.0	3.0	4.0	4.0	7.7
	clopyralid	3	EC	0.188	lb ai/a	EPOS					
	sethoxydim	1.53	EC	0.19	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
LSD (P=.05)							0.47	4.33	5.93	6.79	4.70
Standard Deviation							0.28	2.63	3.59	4.12	2.85
CV							26.91	42.71	45.09	68.2	33.45

Dept. of Horticulture, MSU

Weed Control in Blueberry – Getzoff Farm 2009

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	WLDRASP	BLUEBERRY	ORGR	CWBS	GORO
Pest Code											
Description								BLUEBERRY			
Rating Date							21/May/09	18/Jun/09	18/Jun/09	18/Jun/09	18/Jun/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	diuron	80	DF	1.6	lb ai/a	EPRE	7.0	1.3	10.0	10.0	9.3
	terbacil	80	WP	1.6	lb ai/a	EPRE					
	glufosinate	1.67	L	1.04	lb ai/a	EPOS					
2	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	10.0	1.3	9.0	10.0	4.0
	glufosinate	1.67	L	1.04	lb ai/a	EPRE					
3	mesotrione	4	SC	0.094	lb ai/a	EPRE	10.0	1.0	8.0	7.3	5.7
	NIS	100	SL	0.25	% v/v	EPRE					
4	mesotrione	4	SC	0.188	lb ai/a	EPRE	9.0	1.3	4.3	10.0	10.0
	NIS	100	SL	0.25	% v/v	EPRE					
5	mesotrione	4	SC	0.188	lb ai/a	EPRE	10.0	1.3	8.0	9.0	5.3
	diuron	80	DF	1.6	lb ai/a	EPRE					
	NIS	100	SL	0.25	% v/v	EPRE					
6	diuron	80	DF	3.2	lb ai/a	EPRE	7.0	1.0	7.3	9.0	6.3
	mesotrione	4	SC	0.188	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
7	oryzalin	4	F	4	lb ai/a	EPRE	7.0	1.0	8.7	9.3	6.7
	simazine	90	WDG	3	lb ai/a	EPRE					
	glyphosate	78	DF	1	lb ai/a	EPRE					
	glyphosate	78	DF	1	lb ai/a	EPOS					
8	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	10.0	1.0	6.7	10.0	7.0
	NIS	100	SL	0.25	% v/v	EPRE					
9	pronamide	50	WP	2	lb ai/a	EPRE	8.7	1.0	8.7	10.0	7.3
	diuron	80	DF	2	lb ai/a	EPRE					
	clopyralid	3	EC	0.25	lb ai/a	EPOS					
	sethoxydim	1.53	EC	0.19	lb ai/a	EPOS					
10	s-metolachlor	7.62	EC	2	lb ai/a	EPRE	9.0	1.0	5.7	7.0	4.3
	mesotrione	4	SC	0.188	lb ai/a	EPRE					
11	oxyfluorfen	4	SC	2	lb ai/a	EPRE	10.0	1.0	6.3	9.0	2.7
12	saflufenacil	70	WG	0.045	lb ai/a	EPRE	7.7	1.0	5.3	10.0	7.7
13	sulfentrazone	4	F	0.375	lb ai/a	EPRE	10.0	1.0	6.7	10.0	9.3
	carfentrazone	2	EC	0.031	lb ai/a	EPRE					
	carfentrazone	2	EC	0.031	lb ai/a	EPOS					
14	rimsulfuron	25	DF	0.064	lb ai/a	EPRE	10.0	1.0	9.7	10.0	9.7
	carfentrazone	2	EC	0.031	lb ai/a	EPOS					
15	halosulfuron	75	WG	0.047	lb ai/a	EPRE	7.0	1.0	7.7	10.0	6.7
	oryzalin	4	F	4	lb ai/a	EPRE					
	glyphosate	78	DF	1	lb ai/a	EPRE					
16	halosulfuron	75	WG	0.047	lb ai/a	EPRE	9.0	1.0	9.0	9.3	6.7
	diuron	80	DF	2	lb ai/a	EPRE					
17	halosulfuron	75	WG	0.047	lb ai/a	EPRE	7.7	1.0	6.0	10.0	7.0
	simazine	90	WDG	2	lb ai/a	EPRE					
18	halosulfuron	75	WG	0.047	lb ai/a	EPOS	10.0	1.0	6.0	9.0	9.0
	carfentrazone	2	EC	0.031	lb ai/a	EPOS					
	sethoxydim	1.53	EC	0.19	lb ai/a	EPOS					
	COC	100	SL	1	% v/v	EPOS					
	Ammonium Sulfate	100	SG	3	lb ai/a	EPOS					
19	hexazinone	2	L	1	lb ai/a	EPRE	8.3	1.7	9.3	10.0	6.3
20	Untreated					EPRE	7.0	1.0	5.7	5.0	6.7
	clopyralid	3	EC	0.188	lb ai/a	EPOS					
	sethoxydim	1.53	EC	0.19	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
LSD (P=.05)							5.22	0.58	3.32	3.41	5.43
Standard Deviation							3.16	0.35	2.01	2.07	3.29
CV							36.28	31.74	27.16	22.45	47.78

Weed Control in Blueberry – Getzoff Farm 2009

Dept. of Horticulture, MSU

Pest Code							POIV	WHCA		LACG	QUGR
Description									BLUEBERRY		
Rating Date							18/Jun/09	18/Jun/09	11/Aug/09	11/Aug/09	11/Aug/9
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	diuron	80	DF	1.6	lb ai/a	EPRE	10.0	10.0	1.3	9.7	10.0
	terbacil	80	WP	1.6	lb ai/a	EPRE					
	glufosinate	1.67	L	1.04	lb ai/a	EPOS					
2	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	10.0	7.7	1.7	8.7	10.0
	glufosinate	1.67	L	1.04	lb ai/a	EPRE					
3	mesotrione	4	SC	0.094	lb ai/a	EPRE	4.3	10.0	1.0	8.3	9.0
	NIS	100	SL	0.25	% v/v	EPRE					
4	mesotrione	4	SC	0.188	lb ai/a	EPRE	7.0	10.0	1.7	8.3	7.7
	NIS	100	SL	0.25	% v/v	EPRE					
5	mesotrione	4	SC	0.188	lb ai/a	EPRE	8.3	9.0	1.7	5.0	10.0
	diuron	80	DF	1.6	lb ai/a	EPRE					
	NIS	100	SL	0.25	% v/v	EPRE					
6	diuron	80	DF	3.2	lb ai/a	EPRE	10.0	10.0	1.3	8.3	9.3
	mesotrione	4	SC	0.188	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
7	oryzalin	4	F	4	lb ai/a	EPRE	7.0	9.0	1.7	8.3	10.0
	simazine	90	WDG	3	lb ai/a	EPRE					
	glyphosate	78	DF	1	lb ai/a	EPRE					
	glyphosate	78	DF	1	lb ai/a	EPOS					
8	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	10.0	7.0	1.0	9.7	10.0
	NIS	100	SL	0.25	% v/v	EPRE					
9	pronamide	50	WP	2	lb ai/a	EPRE	10.0	4.7	1.3	6.7	10.0
	diuron	80	DF	2	lb ai/a	EPRE					
	clopyralid	3	EC	0.25	lb ai/a	EPOS					
	sethoxydim	1.53	EC	0.19	lb ai/a	EPOS					
10	s-metolachlor	7.62	EC	2	lb ai/a	EPRE	10.0	10.0	1.0	10.0	9.0
	mesotrione	4	SC	0.188	lb ai/a	EPRE					
11	oxyfluorfen	4	SC	2	lb ai/a	EPRE	2.7	7.7	1.0	9.3	10.0
12	saflufenacil	70	WG	0.045	lb ai/a	EPRE	10.0	4.0	1.7	6.3	10.0
13	sulfentrazone	4	F	0.375	lb ai/a	EPRE	10.0	10.0	2.3	6.7	6.0
	carfentrazone	2	EC	0.031	lb ai/a	EPRE					
	carfentrazone	2	EC	0.031	lb ai/a	EPOS					
14	rimsulfuron	25	DF	0.064	lb ai/a	EPRE	10.0	7.7	1.0	3.0	9.3
	carfentrazone	2	EC	0.031	lb ai/a	EPOS					
15	halosulfuron	75	WG	0.047	lb ai/a	EPRE	10.0	10.0	1.7	8.0	8.7
	oryzalin	4	F	4	lb ai/a	EPRE					
	glyphosate	78	DF	1	lb ai/a	EPRE					
16	halosulfuron	75	WG	0.047	lb ai/a	EPRE	10.0	7.0	1.0	7.3	8.3
	diuron	80	DF	2	lb ai/a	EPRE					
17	halosulfuron	75	WG	0.047	lb ai/a	EPRE	10.0	10.0	1.3	4.7	10.0
	simazine	90	WDG	2	lb ai/a	EPRE					
18	halosulfuron	75	WG	0.047	lb ai/a	EPOS	9.7	10.0	2.7	9.0	10.0
	carfentrazone	2	EC	0.031	lb ai/a	EPOS					
	sethoxydim	1.53	EC	0.19	lb ai/a	EPOS					
	COC	100	SL	1	% v/v	EPOS					
	Ammonium Sulfate	100	SG	3	lb ai/a	EPOS					
19	hexazinone	2	L	1	lb ai/a	EPRE	6.0	9.7	1.7	9.0	10.0
20	Untreated					EPRE	10.0	7.0	1.7	7.3	10.0
	clopyralid	3	EC	0.188	lb ai/a	EPOS					
	sethoxydim	1.53	EC	0.19	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
LSD (P=.05)							3.80	5.14	1.15	3.51	2.04
Standard Deviation							2.30	3.12	0.69	2.13	1.24
CV							26.32	36.6	46.78	27.68	13.22

Weed Control in Blueberry – Getzoff Farm 2009

Dept. of Horticulture, MSU

Pest Code							COPW	HOWE	POIV	RESO	VICR
Description											
Rating Date							11/Aug/09	11/Aug/09	11/Aug/09	11/Aug/09	11/Aug/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt	Treatment	Form	Form		Rate	Growth					
No.	Name	Conc	Type	Rate	Unit	Stage					
1	diuron	80	DF	1.6	lb ai/a	EPRE	10.0	9.3	10.0	9.3	9.3
	terbacil	80	WP	1.6	lb ai/a	EPRE					
	glufosinate	1.67	L	1.04	lb ai/a	EPOS					
2	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	8.0	7.3	10.0	7.0	8.3
	glufosinate	1.67	L	1.04	lb ai/a	EPRE					
3	mesotrione	4	SC	0.094	lb ai/a	EPRE	8.3	7.0	8.3	6.7	10.0
	NIS	100	SL	0.25	% v/v	EPRE					
4	mesotrione	4	SC	0.188	lb ai/a	EPRE	9.7	9.3	10.0	3.3	10.0
	NIS	100	SL	0.25	% v/v	EPRE					
5	mesotrione	4	SC	0.188	lb ai/a	EPRE	9.7	9.3	9.0	6.3	10.0
	diuron	80	DF	1.6	lb ai/a	EPRE					
	NIS	100	SL	0.25	% v/v	EPRE					
6	diuron	80	DF	3.2	lb ai/a	EPRE	9.3	7.0	10.0	8.3	9.3
	mesotrione	4	SC	0.188	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
7	oryzalin	4	F	4	lb ai/a	EPRE	6.3	9.3	7.3	9.0	10.0
	simazine	90	WDG	3	lb ai/a	EPRE					
	glyphosate	78	DF	1	lb ai/a	EPRE					
	glyphosate	78	DF	1	lb ai/a	EPOS					
8	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	10.0	5.0	9.0	10.0	9.7
	NIS	100	SL	0.25	% v/v	EPRE					
9	pronamide	50	WP	2	lb ai/a	EPRE	8.7	9.0	10.0	10.0	9.3
	diuron	80	DF	2	lb ai/a	EPRE					
	clopyralid	3	EC	0.25	lb ai/a	EPOS					
	sethoxydim	1.53	EC	0.19	lb ai/a	EPOS					
10	s-metolachlor	7.62	EC	2	lb ai/a	EPRE	7.7	8.7	10.0	4.7	7.0
	mesotrione	4	SC	0.188	lb ai/a	EPRE					
11	oxyfluorfen	4	SC	2	lb ai/a	EPRE	8.7	4.7	8.3	4.0	8.3
12	saflufenacil	70	WG	0.045	lb ai/a	EPRE	10.0	8.3	10.0	8.0	10.0
13	sulfentrazone	4	F	0.375	lb ai/a	EPRE	10.0	10.0	7.0	10.0	10.0
	carfentrazone	2	EC	0.031	lb ai/a	EPRE					
	carfentrazone	2	EC	0.031	lb ai/a	EPOS					
14	rimsulfuron	25	DF	0.064	lb ai/a	EPRE	10.0	7.0	10.0	7.0	10.0
	carfentrazone	2	EC	0.031	lb ai/a	EPOS					
15	halosulfuron	75	WG	0.047	lb ai/a	EPRE	10.0	10.0	9.3	9.0	10.0
	oryzalin	4	F	4	lb ai/a	EPRE					
	glyphosate	78	DF	1	lb ai/a	EPRE					
16	halosulfuron	75	WG	0.047	lb ai/a	EPRE	9.3	8.3	10.0	10.0	10.0
	diuron	80	DF	2	lb ai/a	EPRE					
17	halosulfuron	75	WG	0.047	lb ai/a	EPRE	8.7	8.0	10.0	6.7	10.0
	simazine	90	WDG	2	lb ai/a	EPRE					
18	halosulfuron	75	WG	0.047	lb ai/a	EPOS	8.7	10.0	10.0	5.7	10.0
	carfentrazone	2	EC	0.031	lb ai/a	EPOS					
	sethoxydim	1.53	EC	0.19	lb ai/a	EPOS					
	COC	100	SL	1	% v/v	EPOS					
	Ammonium Sulfate	100	SG	3	lb ai/a	EPOS					
19	hexazinone	2	L	1	lb ai/a	EPRE	10.0	9.3	6.0	8.3	10.0
20	Untreated					EPRE	8.7	8.3	10.0	8.0	10.0
	clopyralid	3	EC	0.188	lb ai/a	EPOS					
	sethoxydim	1.53	EC	0.19	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
LSD (P=.05)							2.72	3.41	3.29	3.90	2.44
Standard Deviation							1.65	2.06	1.99	2.37	1.48
CV							18.16	24.97	21.65	31.26	15.43

Weed Control in Blueberry – POST VIDA HTRC 2009

Project Code: WC 127-09-03 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Blueberry **Variety: Jersey**
Planting Method: **Planting Date: 1971**
Spacing: 5 ft **Row Spacing: 10 ft**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 3 ft wide x 30 ft long

Soil Type: Capac Loam **OM: 5.0%** **pH: 5.2**
Sand: 61.0% **Silt: 15.0%** **Clay: 24.0%** **CEC: 16.1**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
POSDIR	6/5/09	11:30 am	71/63	F	Moderate	3 W	31.7	0% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
6/5	BLBE = blueberry		Flowering	
6/5	ANBG = annual bluegrass	3-4″		Moderate
6/5	TAFE = tall fescue	6-10″		Many
6/5	BHPL = buckhorn plantain	6-8″		Moderate
6/5	BRPL = broadleaf plantain	6-8″		Moderate
6/5	CATH = Canada thistle	4-6″		Many
6/5	DAND = dandelion	4-8″		Many
6/5	PUSW = purslane speedwell	3-4″		Few
6/5	QUGR = quackgrass	4-6″		Many
6/5	WHCL = white clover	3-4″		Moderate
6/5	WICA = wild carrot	8-12″		Few

Notes and Comments
1. Sprays applied with 2 nozzle boom FF11002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer, between blueberry rows.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.

Weed Control in Blueberry – POST VIDA HTRC 2009

Trial ID: 127-09-03 Study Director: Dr. Bernard Zandstra
Location: HTRC – East Lansing Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Blueberry	TAFE	BHPL	BRPL	CATH
Pest Code											
Description											
Rating Date							6/Jul/2009	6/Jul/2009	6/Jul/2009	6/Jul/2009	6/Jul/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	pyraflufen	0.208	EC	0.0016	lb ai/a	POSDIR	1.0	1.3	3.3	2.3	4.0
	COC	100	SL	1	% v/v	POSDIR					
2	pyraflufen	0.208	EC	0.0016	lb ai/a	POSDIR	1.0	6.7	3.3	2.3	8.3
	sethoxydim	1.53	EC	0.19	lb ai/a	POSDIR					
	COC	100	SL	1	% v/v	POSDIR					
3	pyraflufen	0.208	EC	0.0016	lb ai/a	POSDIR	1.0	1.0	2.3	2.3	7.3
	halosulfuron	75	WG	0.031	lb ai/a	POSDIR					
	COC	100	SL	1	% v/v	POSDIR					
4	pyraflufen	0.208	EC	0.0016	lb ai/a	POSDIR	1.0	5.7	3.7	2.3	10.0
	halosulfuron	75	WG	0.031	lb ai/a	POSDIR					
	sethoxydim	1.53	EC	0.19	lb ai/a	POSDIR					
	COC	100	SL	1	% v/v	POSDIR					
5	paraquat	2	L	0.5	lb ai/a	POSDIR	1.0	2.3	6.3	6.7	9.0
	NIS	100	SL	0.25	% v/v	POSDIR					
6	carfentrazone	2	EC	0.031	lb ai/a	POSDIR	1.0	1.0	7.0	5.0	6.7
	NIS	100	SL	0.25	% v/v	POSDIR					
	Ammonium Sulfate	100	SG	3	lb/a	POSDIR					
7	Untreated						1.0	1.0	1.3	1.3	4.3
LSD (P=.05)							0.00	2.65	5.16	3.58	6.12
Standard Deviation							0.00	1.49	2.90	2.01	3.44
CV							0.0	54.92	74.32	63.0	48.48

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	WHCL	WICA	Blueberry	CATH	QUGR
Pest Code											
Description											
Rating Date							6/Jul/2009	6/Jul/2009	24/Jul/2009	24/Jul/2009	24/Jul/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	pyraflufen	0.208	EC	0.0016	lb ai/a	POSDIR	1.7	1.7	1.0	3.3	2.0
	COC	100	SL	1	% v/v	POSDIR					
2	pyraflufen	0.208	EC	0.0016	lb ai/a	POSDIR	2.3	2.0	1.0	8.0	4.7
	sethoxydim	1.53	EC	0.19	lb ai/a	POSDIR					
	COC	100	SL	1	% v/v	POSDIR					
3	pyraflufen	0.208	EC	0.0016	lb ai/a	POSDIR	1.0	6.3	1.3	9.0	1.7
	halosulfuron	75	WG	0.031	lb ai/a	POSDIR					
	COC	100	SL	1	% v/v	POSDIR					
4	pyraflufen	0.208	EC	0.0016	lb ai/a	POSDIR	1.7	7.3	1.0	8.3	7.7
	halosulfuron	75	WG	0.031	lb ai/a	POSDIR					
	sethoxydim	1.53	EC	0.19	lb ai/a	POSDIR					
	COC	100	SL	1	% v/v	POSDIR					
5	paraquat	2	L	0.5	lb ai/a	POSDIR	1.3	5.3	1.0	7.7	2.7
	NIS	100	SL	0.25	% v/v	POSDIR					
6	carfentrazone	2	EC	0.031	lb ai/a	POSDIR	3.7	4.0	1.7	7.0	1.7
	NIS	100	SL	0.25	% v/v	POSDIR					
	Ammonium Sulfate	100	SG	3	lb/a	POSDIR					
7	Untreated						3.0	1.0	1.0	7.0	3.7
LSD (P=.05)							3.28	2.84	0.90	6.79	2.68
Standard Deviation							1.84	1.60	0.50	3.82	1.50
CV							87.86	40.38	44.1	53.07	43.87

Weed Control in Blueberry – POST VIDA HTRC 2009

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Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	BHPL	DAND	WICA	WHCL	Blueberry
Pest Code							BHPL	DAND	WICA	WHCL	
Description											Blueberry
Rating Date							24/Jul/2009	24/Jul/2009	24/Jul/2009	24/Jul/2009	31/Jul/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	pyraflufen	0.208	EC	0.0016	lb ai/a	POSDIR	1.0	3.0	4.0	4.3	1.0
	COC	100	SL	1	% v/v	POSDIR					
2	pyraflufen	0.208	EC	0.0016	lb ai/a	POSDIR	4.0	1.7	1.0	1.3	1.0
	sethoxydim	1.53	EC	0.19	lb ai/a	POSDIR					
	COC	100	SL	1	% v/v	POSDIR					
3	pyraflufen	0.208	EC	0.0016	lb ai/a	POSDIR	5.3	3.7	1.0	1.7	1.0
	halosulfuron	75	WG	0.031	lb ai/a	POSDIR					
	COC	100	SL	1	% v/v	POSDIR					
4	pyraflufen	0.208	EC	0.0016	lb ai/a	POSDIR	3.0	6.3	6.7	3.0	1.0
	halosulfuron	75	WG	0.031	lb ai/a	POSDIR					
	sethoxydim	1.53	EC	0.19	lb ai/a	POSDIR					
	COC	100	SL	1	% v/v	POSDIR					
5	paraquat	2	L	0.5	lb ai/a	POSDIR	5.0	3.0	5.0	1.0	1.3
	NIS	100	SL	0.25	% v/v	POSDIR					
6	carfentrazone	2	EC	0.031	lb ai/a	POSDIR	8.0	3.0	5.0	7.0	1.0
	NIS	100	SL	0.25	% v/v	POSDIR					
	Ammonium Sulfate	100	SG	3	lb/a	POSDIR					
7	Untreated						1.3	1.3	2.7	3.0	1.0
LSD (P=.05)							4.84	4.25	3.40	6.35	0.39
Standard Deviation							2.72	2.39	1.91	3.57	0.22
CV							68.78	75.95	52.8	117.07	20.83

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	QUGR	BHPL	CATH	WHCL	WICA
Pest Code							QUGR	BHPL	CATH	WHCL	WICA
Description											
Rating Date							31/Jul/2009	31/Jul/2009	31/Jul/2009	31/Jul/2009	31/Jul/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	pyraflufen	0.208	EC	0.0016	lb ai/a	POSDIR	2.7	1.7	4.0	3.7	1.3
	COC	100	SL	1	% v/v	POSDIR					
2	pyraflufen	0.208	EC	0.0016	lb ai/a	POSDIR	5.0	4.7	4.7	3.7	1.3
	sethoxydim	1.53	EC	0.19	lb ai/a	POSDIR					
	COC	100	SL	1	% v/v	POSDIR					
3	pyraflufen	0.208	EC	0.0016	lb ai/a	POSDIR	2.7	4.7	7.7	3.7	4.0
	halosulfuron	75	WG	0.031	lb ai/a	POSDIR					
	COC	100	SL	1	% v/v	POSDIR					
4	pyraflufen	0.208	EC	0.0016	lb ai/a	POSDIR	5.0	4.0	7.7	1.7	6.7
	halosulfuron	75	WG	0.031	lb ai/a	POSDIR					
	sethoxydim	1.53	EC	0.19	lb ai/a	POSDIR					
	COC	100	SL	1	% v/v	POSDIR					
5	paraquat	2	L	0.5	lb ai/a	POSDIR	4.0	5.7	8.3	3.0	6.3
	NIS	100	SL	0.25	% v/v	POSDIR					
6	carfentrazone	2	EC	0.031	lb ai/a	POSDIR	2.0	6.3	6.3	6.0	6.7
	NIS	100	SL	0.25	% v/v	POSDIR					
	Ammonium Sulfate	100	SG	3	lb/a	POSDIR					
7	Untreated						4.3	2.7	7.7	4.3	4.7
LSD (P=.05)							3.97	5.69	7.85	4.80	4.47
Standard Deviation							2.23	3.20	4.41	2.70	2.51
CV							60.79	75.47	66.62	72.63	56.72

Weed Control in Blueberry – TNRC 2009

Project Code: WC 127-09-02 Location: Felker, Fennville, MI

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Blueberry Variety: Jersey
Planting Method: Planting Date:
Spacing: 5 FT Row Spacing: 10 FT
Tillage Type: Conventional Study Design: RCB Replications: 3
Plot Size: 6 ft wide x 34 ft long

Soil Type: Loamy Sand OM: 9.6% pH: 4.0
Sand: 81.1% Silt: 18.5% Clay: 0.4% CEC: 22.9

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
PRE	4/16/09	10:00 am	50/43	F	Damp	4 SE	39	0% Cloudy	N
EPOS	6/11/09	8:30 am	68/62	F	Damp	1-3 E	71	100% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/16	BLBE = blueberry		Pre-bud	
4/16	QUGR = quackgrass	2-3″	Ground Covered	
6/11	BLBE = blueberry		Sm. Grn. Fruit	
6/11	CORW = common ragweed	4-6″		Moderate
6/11	HOWE = horseweed (marestail)	6-8″		Moderate
6/11	LATH = ladysthumb	4-6″		Few
6/11	ORGR = orchardgrass	6-12″		Moderate
6/11	QUGR = quackgrass	6-12″		Moderate
6/11	WICA = wild carrot	1-3″		Moderate

Notes and Comments
1. Sprays applied with 2 nozzle boom FF11002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. One boom pass on each side of row.
4. All plots mowed prior to 7/15/08 spray.

Weed Control in Blueberry – TNRC 2009

Trial ID: 127-09-02 Study Director: Dr. Bernard Zandstra
Location: TNRC - Felker Investigator: Rodney Tocco

Pest Code								ORGR	QUGR	POIV	COPW
Description							BLUEBERRY				
Rating Date							21/May/09	21/May/09	21/May/09	21/May/09	21/May/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	diuron	80	DF	2	lb ai/a	EPRE	1.3	10.0	10.0	10.0	4.7
	terbacil	80	WP	1.6	lb ai/a	EPRE					
2	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	1.0	9.7	9.3	10.0	7.3
3	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	1.7	10.0	9.3	9.3	7.3
	glufosinate	1.67	L	1.04	lb ai/a	EPRE					
4	mesotrione	4	SC	0.188	lb ai/a	EPRE	2.3	8.3	8.7	7.0	2.0
	NIS	100	SL	0.25	% v/v	EPRE					
5	sulfentrazone	4	F	0.375	lb ai/a	EPRE	2.3	10.0	6.3	10.0	4.3
	carfentrazone	2	EC	0.031	% v/v	EPRE					
6	saflufenacil	70	WG	0.045	lb ai/a	EPRE	1.7	8.3	4.3	10.0	4.3
7	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	2.0	9.0	4.3	8.7	10.0
8	rimsulfuron	25	DF	0.064	lb ai/a	EPRE	1.7	10.0	9.0	7.0	10.0
9	halosulfuron	75	WG	0.047	lb ai/a	EPRE	1.3	10.0	6.7	9.3	6.7
	diuron	80	DF	2	lb ai/a	EPRE					
10	halosulfuron	75	WG	0.047	lb ai/a	EPOS	1.7	8.7	8.0	9.7	7.0
	carfentrazone	2	EC	0.031	lb ai/a	EPOS					
	sethoxydim	1.53	EC	0.19	lb ai/a	EPOS					
	COC	100	SL	1	% v/v	EPOS					
	Ammonium Sulfate	100	SG	3	lb ai/a	EPOS					
11	diuron	80	DF	2	lb ai/a	EPRE	2.0	9.7	10.0	10.0	2.3
	oryzalin	4	F	4	lb ai/a	EPRE					
	glyphosate	78	DF	1	lb ai/a	EPRE					
12	Untreated					EPRE	1.3	7.0	5.0	8.7	4.0
	clopyralid	3	EC	0.188	lb ai/a	EPOS					
	sethoxydim	1.53	EC	0.19	lb ai/a	EPOS					
LSD (P=.05)							1.32	2.71	3.79	3.84	7.09
Standard Deviation							0.78	1.60	2.24	2.27	4.19
CV							45.85	17.37	29.51	24.81	71.81

Weed Control in Blueberry – TNRC 2009

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Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code							WLDRASP		ORGR	QUGR	COPW
Description								BLUEBERRY			
Rating Date							21/May/09	18/Jun/09	18/Jun/09	18/Jun/09	18/Jun/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	diuron	80	DF	2	lb ai/a	EPRE	5.3	1.0	9.0	9.7	4.7
	terbacil	80	WP	1.6	lb ai/a	EPRE					
2	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	4.7	1.0	9.0	9.0	9.3
3	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	7.3	1.3	7.7	9.0	8.3
	glufosinate	1.67	L	1.04	lb ai/a	EPRE					
4	mesotrione	4	SC	0.188	lb ai/a	EPRE	4.0	2.3	8.3	7.0	5.0
	NIS	100	SL	0.25	% v/v	EPRE					
5	sulfentrazone	4	F	0.375	lb ai/a	EPRE	1.3	1.3	10.0	6.0	4.0
	carfentrazone	2	EC	0.031	% v/v	EPRE					
6	saflufenacil	70	WG	0.045	lb ai/a	EPRE	2.7	1.3	7.3	5.3	4.0
7	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	3.7	1.0	9.0	7.0	10.0
8	rimsulfuron	25	DF	0.064	lb ai/a	EPRE	5.7	1.0	10.0	8.0	10.0
9	halosulfuron	75	WG	0.047	lb ai/a	EPRE	6.0	1.3	9.7	7.0	10.0
	diuron	80	DF	2	lb ai/a	EPRE					
10	halosulfuron	75	WG	0.047	lb ai/a	EPOS	7.0	1.0	7.7	6.7	7.7
	carfentrazone	2	EC	0.031	lb ai/a	EPOS					
	sethoxydim	1.53	EC	0.19	lb ai/a	EPOS					
	COC	100	SL	1	% v/v	EPOS					
	Ammonium Sulfate	100	SG	3	lb ai/a	EPOS					
11	diuron	80	DF	2	lb ai/a	EPRE	4.0	1.3	8.7	8.7	4.3
	oryzalin	4	F	4	lb ai/a	EPRE					
	glyphosate	78	DF	1	lb ai/a	EPRE					
12	Untreated					EPRE	2.7	1.7	10.0	6.0	4.7
	clopyralid	3	EC	0.188	lb ai/a	EPOS					
	sethoxydim	1.53	EC	0.19	lb ai/a	EPOS					
LSD (P=.05)							7.27	1.05	3.66	3.62	6.33
Standard Deviation							4.30	0.62	2.16	2.14	3.74
CV							94.87	47.45	24.41	28.73	54.74

Weed Control in Blueberry – TNRC 2009

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Pest Code							GORO	POIV	VICR		QUGR
Description										BLUEBERRY	
Rating Date							18/Jun/09	18/Jun/09	18/Jun/09	11/Aug/09	11/Aug/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
1	diuron	80	DF	2	lb ai/a	EPRE	9.0	10.0	7.0	1.0	8.3
	terbacil	80	WP	1.6	lb ai/a	EPRE					
2	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	7.0	10.0	7.7	1.7	6.3
3	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	7.0	9.7	5.7	2.0	7.3
	glufosinate	1.67	L	1.04	lb ai/a	EPRE					
4	mesotrione	4	SC	0.188	lb ai/a	EPRE	10.0	7.0	6.7	2.7	3.7
	NIS	100	SL	0.25	% v/v	EPRE					
5	sulfentrazone	4	F	0.375	lb ai/a	EPRE	7.0	10.0	6.3	2.3	2.7
	carfentrazone	2	EC	0.031	% v/v	EPRE					
6	saflufenacil	70	WG	0.045	lb ai/a	EPRE	4.3	10.0	3.7	1.7	3.3
7	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	6.7	9.3	3.7	1.7	8.0
8	rimsulfuron	25	DF	0.064	lb ai/a	EPRE	6.7	4.0	4.0	1.7	4.7
9	halosulfuron	75	WG	0.047	lb ai/a	EPRE	5.3	7.0	1.3	1.7	7.7
	diuron	80	DF	2	lb ai/a	EPRE					
10	halosulfuron	75	WG	0.047	lb ai/a	EPOS	10.0	9.0	9.0	2.7	8.3
	carfentrazone	2	EC	0.031	lb ai/a	EPOS					
	sethoxydim	1.53	EC	0.19	lb ai/a	EPOS					
	COC	100	SL	1	% v/v	EPOS					
	Ammonium Sulfate	100	SG	3	lb ai/a	EPOS					
11	diuron	80	DF	2	lb ai/a	EPRE	9.3	6.3	7.3	2.0	8.0
	oryzalin	4	F	4	lb ai/a	EPRE					
	glyphosate	78	DF	1	lb ai/a	EPRE					
12	Untreated					EPRE	8.3	4.7	2.3	2.3	5.7
	clopyralid	3	EC	0.188	lb ai/a	EPOS					
	sethoxydim	1.53	EC	0.19	lb ai/a	EPOS					
LSD (P=.05)							6.43	5.06	5.29	1.65	4.21
Standard Deviation							3.80	2.99	3.13	0.98	2.49
CV							50.24	36.97	58.0	50.18	40.34

Weed Control in Blueberry – TNRC 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	WLDGRP	COPW	CORW	HOWE	POIV	VICR
Pest Code							WLDGRP	COPW	CORW	HOWE	POIV	VICR
Description												
Rating Date							11/Aug/09	11/Aug/09	11/Aug/09	11/Aug/09	11/Aug/09	11/Aug/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10	1-10
1	diuron	80	DF	2	lb ai/a	EPRE	10.0	7.0	10.0	8.7	10.0	8.7
	terbacil	80	WP	1.6	lb ai/a	EPRE						
2	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	8.0	9.3	9.7	4.7	10.0	7.7
3	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	6.7	9.3	8.7	8.0	9.7	6.0
	glufosinate	1.67	L	1.04	lb ai/a	EPRE						
4	mesotrione	4	SC	0.188	lb ai/a	EPRE	8.7	7.3	8.3	8.7	8.3	5.3
	NIS	100	SL	0.25	% v/v	EPRE						
5	sulfentrazone	4	F	0.375	lb ai/a	EPRE	10.0	5.3	10.0	7.3	9.0	8.0
	carfentrazone	2	EC	0.031	% v/v	EPRE						
6	saflufenacil	70	WG	0.045	lb ai/a	EPRE	8.0	5.0	9.7	7.3	10.0	8.3
7	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	10.0	7.7	10.0	6.0	7.7	6.7
8	rimsulfuron	25	DF	0.064	lb ai/a	EPRE	7.7	10.0	10.0	8.3	4.0	7.3
9	halosulfuron	75	WG	0.047	lb ai/a	EPRE	8.7	6.3	10.0	7.7	6.3	4.7
	diuron	80	DF	2	lb ai/a	EPRE						
10	halosulfuron	75	WG	0.047	lb ai/a	EPOS	9.7	7.0	10.0	9.3	10.0	9.0
	carfentrazone	2	EC	0.031	lb ai/a	EPOS						
	sethoxydim	1.53	EC	0.19	lb ai/a	EPOS						
	COC	100	SL	1	% v/v	EPOS						
	Ammonium Sulfate	100	SG	3	lb ai/a	EPOS						
11	diuron	80	DF	2	lb ai/a	EPRE	9.7	6.0	10.0	8.3	10.0	9.0
	oryzalin	4	F	4	lb ai/a	EPRE						
	glyphosate	78	DF	1	lb ai/a	EPRE						
12	Untreated					EPRE	9.7	6.7	10.0	8.3	9.7	7.7
	clopyralid	3	EC	0.188	lb ai/a	EPOS						
	sethoxydim	1.53	EC	0.19	lb ai/a	EPOS						
LSD (P=.05)							3.70	5.80	1.75	4.98	3.50	4.79
Standard Deviation							2.18	3.43	1.04	2.94	2.06	2.83
CV							24.57	47.28	10.69	38.12	23.67	38.45

Weed Control in Cherry – CHES 2009

Project Code: WC 128-09-04 **Location: Clarksville, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Sweet Cherry **Variety: Heidlefingen, Ulster**
Planting Method: Transplant **Planting Date: 1995**
Spacing: 8 FT in row **Row Spacing: 16 FT**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 11 ft wide x 40 ft long

Soil Type: Dryden Sandy Loam **OM: 1.9%** **pH: 7.2**
Sand: 61.5% **Silt: 29.8%** **Clay: 8.7%** **CEC: 6.1**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
EPRE	4/17/09	10:00 am	59/48	F	Damp	5 NW	41	0% Cloudy	N
EPRE	4/24/09	2:30 pm	78/59	F	Dry	6 SW	40	30% Cloudy	N
EPOS	6/9/09	12:45 pm	72/65	F	Moist	3-5 W	65.1	100% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/17	CHERRY		Bud swell	
4/17	ANBG = annual bluegrass	1-2″		Many
4/17	DAND = dandelion	1-3″		Many
4/17	WHCL = white clover	1-2″		Few
6/9	CHERRY		Sm. Gr. Fruit	
6/9	DAND = dandelion	6-12″		Moderate
6/9	DOBG = downy bromegrass	12-24″		Many
6/9	RESO = red sorrel	6-7″		Moderate
6/9	RSFI = redstem filaree	1-3″		Many
6/9	WHCL = white clover	2-4″		Many

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer. One pass on each side of row.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. EPRE treatments 4 and 12 sprayed on 4/24, all other EPRE applied on 4/17.

Weed Control in Cherry – CHES 2009

Dept. of Horticulture, MSU

Trial ID: WC 128-09-04 Study Director: Dr. Bernard Zandstra
Location: CHES Investigator: Rodney Tocco, Jr

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	Cherry	ANBG	DOBR	TAFE
Pest Code								ANBG	DOBR	TAFE
Description							Cherry			
Rating Date							26/May/2009	26/May/2009	26/May/2009	26/May/2009
Rating Data Type							RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10
1	Untreated						1.0	1.0	7.0	6.3
2	saflufenacil	70	WG	0.045	lb ai/a	EPRE, EPOS	1.0	3.7	7.0	8.7
	COC	100	SL	1	% v/v	EPRE,EPOS				
	Ammonium Sulfate	100	SG	3.0	lb ai/a	EPRE,EPOS				
3	halosulfuron	75	WG	0.047	lb ai/a	EPRE	1.0	8.3	6.0	9.3
	oryzalin	4	F	2	lb ai/a	EPRE				
	glyphosate	5.5	L	0.75	lb ai/a	EPOS				
4	rimsulfuron	25	DF	0.064	lb ai/a	EPRE	1.0	8.7	6.0	9.0
	glyphosate	5.5	L	0.75	lb ai/a	EPOS				
5	sulfentrazone	4	F	0.375	lb ai/a	EPRE	1.0	3.7	6.0	9.0
	glyphosate	5.5	L	0.75	lb ai/a	EPOS				
6	mesotrione	4	SC	0.188	lb ai/a	EPRE	1.0	2.3	4.0	9.3
	glyphosate	5.5	L	0.75	lb ai/a	EPOS				
7	diuron	80	WP	3.2	lb ai/a	EPRE	1.0	8.3	7.0	9.0
	glyphosate	5.5	L	0.75	lb ai/a	EPOS				
8	terbacil	80	WP	2	lb ai/a	PRE	1.0	9.7	9.0	9.0
	glyphosate	5.5	L	0.75	lb ai/a	EPOS				
9	glufosinate	1.67	L	1.04	lb ai/a	EPRE,EPOS	1.0	7.0	9.7	9.0
10	flumioxazin	51	WDG	0.256	lb ai/a	EPRE	1.0	6.7	10.0	10.0
	glufosinate	1.67	L	1.04	lb ai/a	EPRE,EPOS				
11	pendimethalin	3.8	CS	3.8	lb ai/a	EPRE	1.0	8.7	5.7	9.3
	glufosinate	1.67	L	1.04	lb ai/a	EPRE,EPOS				
12	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	1.0	10.0	10.0	8.0
	glufosinate	1.67	L	1.04	lb ai/a	EPRE,EPOS				
LSD (P=.05)							0.00	3.78	6.52	2.80
Standard Deviation							0.00	2.23	3.85	1.65
CV							0.0	34.3	52.88	18.72

Weed Control in Cherry – CHES 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	CWBS	DAND	RECL	Cherry
Pest Code							CWBS	DAND	RECL	
Description										Cherry
Rating Date							26/May/2009	26/May/2009	26/May/2009	24/Jun/2009
Rating Data Type							RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10
1	Untreated						6.7	3.3	1.0	1.0
2	saflufenacil	70	WG	0.045	lb ai/a	EPRE, EPOS	9.0	6.3	10.0	1.0
	COC	100	SL	1	% v/v	EPRE,EPOS				
	Ammonium Sulfate	100	SG	3.0	lb ai/a	EPRE,EPOS				
3	halosulfuron	75	WG	0.047	lb ai/a	EPRE	6.3	7.7	4.0	1.0
	oryzalin	4	F	2	lb ai/a	EPRE				
	glyphosate	5.5	L	0.75	lb ai/a	EPOS				
4	rimsulfuron	25	DF	0.064	lb ai/a	EPRE	5.3	9.7	8.7	1.0
	glyphosate	5.5	L	0.75	lb ai/a	EPOS				
5	sulfentrazone	4	F	0.375	lb ai/a	EPRE	7.0	9.0	5.7	2.0
	glyphosate	5.5	L	0.75	lb ai/a	EPOS				
6	mesotrione	4	SC	0.188	lb ai/a	EPRE	6.7	8.7	3.3	1.0
	glyphosate	5.5	L	0.75	lb ai/a	EPOS				
7	diuron	80	WP	3.2	lb ai/a	EPRE	9.3	8.7	9.7	1.0
	glyphosate	5.5	L	0.75	lb ai/a	EPOS				
8	terbacil	80	WP	2	lb ai/a	PRE	8.7	10.0	10.0	1.0
	glyphosate	5.5	L	0.75	lb ai/a	EPOS				
9	glufosinate	1.67	L	1.04	lb ai/a	EPRE,EPOS	6.7	9.7	10.0	1.0
10	flumioxazin	51	WDG	0.256	lb ai/a	EPRE	10.0	9.0	4.3	1.0
	glufosinate	1.67	L	1.04	lb ai/a	EPRE,EPOS				
11	pendimethalin	3.8	CS	3.8	lb ai/a	EPRE	6.7	10.0	10.0	1.0
	glufosinate	1.67	L	1.04	lb ai/a	EPRE,EPOS				
12	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	10.0	9.7	10.0	1.0
	glufosinate	1.67	L	1.04	lb ai/a	EPRE,EPOS				
LSD (P=.05)							5.87	3.01	3.73	0.00
Standard Deviation							3.46	1.77	2.20	0.00
CV							45.02	20.95	30.53	0.0

Weed Control in Cherry – CHES 2009

Dept. of Horticulture, MSU

Pest Code							ANBG	DOBR	TAFE	DAND
Description										
Rating Date							24/Jun/2009	24/Jun/2009	24/Jun/2009	24/Jun/2009
Rating Data Type							RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage				
1	Untreated						4.0	4.7	4.3	1.0
2	saflufenacil	70	WG	0.045	lb ai/a	EPRE, EPOS	6.3	6.0	6.3	8.3
	COC	100	SL	1	% v/v	EPRE,EPOS				
	Ammonium Sulfate	100	SG	3.0	lb ai/a	EPRE,EPOS				
3	halosulfuron	75	WG	0.047	lb ai/a	EPRE	9.7	9.7	10.0	8.7
	oryzalin	4	F	2	lb ai/a	EPRE				
	glyphosate	5.5	L	0.75	lb ai/a	EPOS				
4	rimsulfuron	25	DF	0.064	lb ai/a	EPRE	9.7	9.3	9.0	10.0
	glyphosate	5.5	L	0.75	lb ai/a	EPOS				
5	sulfentrazone	4	F	0.375	lb ai/a	EPRE	9.3	9.0	9.7	9.7
	glyphosate	5.5	L	0.75	lb ai/a	EPOS				
6	mesotrione	4	SC	0.188	lb ai/a	EPRE	9.3	9.7	9.3	9.7
	glyphosate	5.5	L	0.75	lb ai/a	EPOS				
7	diuron	80	WP	3.2	lb ai/a	EPRE	9.0	9.7	9.0	9.3
	glyphosate	5.5	L	0.75	lb ai/a	EPOS				
8	terbacil	80	WP	2	lb ai/a	PRE	10.0	10.0	9.7	10.0
	glyphosate	5.5	L	0.75	lb ai/a	EPOS				
9	glufosinate	1.67	L	1.04	lb ai/a	EPRE,EPOS	9.3	10.0	9.7	10.0
10	flumioxazin	51	WDG	0.256	lb ai/a	EPRE	9.0	10.0	10.0	10.0
	glufosinate	1.67	L	1.04	lb ai/a	EPRE,EPOS				
11	pendimethalin	3.8	CS	3.8	lb ai/a	EPRE	10.0	9.0	10.0	10.0
	glufosinate	1.67	L	1.04	lb ai/a	EPRE,EPOS				
12	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	10.0	9.3	9.3	10.0
	glufosinate	1.67	L	1.04	lb ai/a	EPRE,EPOS				
LSD (P=.05)							3.05	3.32	2.77	1.73
Standard Deviation							1.80	1.96	1.64	1.02
CV							20.44	22.11	18.47	11.49

Weed Control in Cherry – CHES 2009

Dept. of Horticulture, MSU

Pest Code								TAFE	DAND
Description							Cherry		
Rating Date							21/Jul/2009	21/Jul/2009	21/Jul/2009
Rating Data Type							RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage			
1	Untreated						1.0	5.7	2.7
2	saflufenacil	70	WG	0.045	lb ai/a	EPRE, EPOS	1.0	4.3	6.7
	COC	100	SL	1	% v/v	EPRE,EPOS			
	Ammonium Sulfate	100	SG	3.0	lb ai/a	EPRE,EPOS			
3	halosulfuron	75	WG	0.047	lb ai/a	EPRE	1.0	9.3	9.7
	oryzalin	4	F	2	lb ai/a	EPRE			
	glyphosate	5.5	L	0.75	lb ai/a	EPOS			
4	rimsulfuron	25	DF	0.064	lb ai/a	EPRE	1.0	8.3	10.0
	glyphosate	5.5	L	0.75	lb ai/a	EPOS			
5	sulfentrazone	4	F	0.375	lb ai/a	EPRE	1.7	8.0	9.7
	glyphosate	5.5	L	0.75	lb ai/a	EPOS			
6	mesotrione	4	SC	0.188	lb ai/a	EPRE	1.0	6.0	9.7
	glyphosate	5.5	L	0.75	lb ai/a	EPOS			
7	diuron	80	WP	3.2	lb ai/a	EPRE	1.0	8.3	9.7
	glyphosate	5.5	L	0.75	lb ai/a	EPOS			
8	terbacil	80	WP	2	lb ai/a	PRE	1.0	8.7	10.0
	glyphosate	5.5	L	0.75	lb ai/a	EPOS			
9	glufosinate	1.67	L	1.04	lb ai/a	EPRE,EPOS	1.0	8.7	9.0
10	flumioxazin	51	WDG	0.256	lb ai/a	EPRE	1.0	9.7	10.0
	glufosinate	1.67	L	1.04	lb ai/a	EPRE,EPOS			
11	pendimethalin	3.8	CS	3.8	lb ai/a	EPRE	1.0	9.3	9.3
	glufosinate	1.67	L	1.04	lb ai/a	EPRE,EPOS			
12	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	1.3	8.0	10.0
	glufosinate	1.67	L	1.04	lb ai/a	EPRE,EPOS			
LSD (P=.05)							0.64	2.62	1.27
Standard Deviation							0.38	1.55	0.75
CV							35.02	19.67	8.43

Cherry Tolerance to Treevix – HTRC 2009

Project Code: WC 128-09-05 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Sweet Cherry **Variety: Montmorency**
Planting Method: Transplant **Planting Date: 1984**
Spacing: 8 FT in row **Row Spacing: 16 FT**
Tillage Type: Conventional **Study Design: RCB** **Replications: 4**
Plot Size: 18 ft wide x 50 ft long

Soil Type: Marlette Fine Sandy Loam **OM: 2.2%** **pH: 6.4**
Sand: 71.5% **Silt: 23.1%** **Clay: 5.4%** **CEC: 4.1**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
A EPRE	4/23/09	11:30 am	45/47	F	Wet	4-6 SW	50	0% Cloudy	N
B EPOS	6/3/09	4:00 pm	73/65	F	Dry	1-3 W	27	50% Cloudy	N
C CPOS	7/10/09	11:00 am	78/67	F	Dry	1-3 SW	64.9	100% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/23	CHERRY		SM Buds	
4/23	DAND = dandelion			Many
4/23	QUGR = quackgrass			Many
6/3	CHERRY	0.5″	SM Buds	
6/3	ANBG = annual bluegrass	2-6″		Many
6/3	DAND = dandelion	4-6″		Moderate
6/3	HOWE = horseweed (marestail)	2-3″		Many
6/3	QUGR = quackgrass	2-3″		Many
6/3	RECL = red clover	1-2″		Moderate
6/3	WICA = wild carrot	2-8″		Few
7/10	CHERRY	0.5-0.75″	Ripe Berry	
7/10	ANBG = annual bluegrass	3-6″		Many
7/10	DAND = dandelion	<3″		Few
7/10	HOWE = horseweed (marestail)	<1″		Few
7/10	QUGR = quackgrass	3-5″		Many
7/10	RECL = red clover	1-2″		Few
7/10	WICA = wild carrot	3-8″		Few

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.
3. This is a two year experiment.
4. Keep plots clean with glyphosate during the season.
5. Phyto and weed control ratings 7, 15 and 30 DAT and at each application.
6. Rate fruit quality each time.

Cherry Tolerance to Treevix – HTRC 2009

Dept. of Horticulture, MSU

Trial ID: WC 128-09-05 Study Director: Dr. Bernard Zandstra
Location: CHES Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code								ORGR	QUGR	DAND	GORO
Description							CHERRY				
Rating Date							3/Jun/2009	3/Jun/2009	3/Jun/2009	3/Jun/2009	3/Jun/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	Untreated						1.0	1.0	1.5	1.0	1.5
	glyphosate	5.5	L	0.75	lb ai/a	A,B,C					
2	saflufenacil	70	WG	0.09	lb ai/a	A,B,C	1.0	2.8	3.5	2.5	2.8
	COC	100	SL	1	% v/v	A,B,C					
	Ammonium Sulfate	100	SG	3.0	lb ai/a	A,B,C					
3	sulfentrazone	4	F	0.375	lb ai/a	A,B,C	1.0	3.3	2.3	2.5	3.3
	COC	100	SL	1	% v/v	A,B,C					
LSD (P=.05)							0.00	3.22	2.63	2.64	2.18
Standard Deviation							0.00	1.86	1.52	1.53	1.26
CV							0.0	79.86	62.83	76.38	50.33

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage					
Pest Code							RECL	WICA		QUGR	TAFE
Description									CHERRY		
Rating Date							3/Jun/2009	3/Jun/2009	13/Jul/2009	13/Jul/2009	13/Jul/2009
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	Untreated						2.5	6.3	1.0	4.8	5.0
	glyphosate	5.5	L	0.75	lb ai/a	A,B,C					
2	saflufenacil	70	WG	0.09	lb ai/a	A,B,C	4.5	7.0	1.0	1.5	1.8
	COC	100	SL	1	% v/v	A,B,C					
	Ammonium Sulfate	100	SG	3.0	lb ai/a	A,B,C					
3	sulfentrazone	4	F	0.375	lb ai/a	A,B,C	3.5	4.8	1.0	4.8	3.5
	COC	100	SL	1	% v/v	A,B,C					
LSD (P=.05)							5.71	4.66	0.00	3.86	3.84
Standard Deviation							3.30	2.69	0.00	2.23	2.22
CV							94.28	44.88	0.0	60.81	64.9

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	
Pest Code							DAND
Description							
Rating Date							13/Jul/2009
Rating Data Type							RATING
Rating Unit							1-10
1	Untreated						7.5
	glyphosate	5.5	L	0.75	lb ai/a	A,B,C	
2	saflufenacil	70	WG	0.09	lb ai/a	A,B,C	9.5
	COC	100	SL	1	% v/v	A,B,C	
	Ammonium Sulfate	100	SG	3.0	lb ai/a	A,B,C	
3	sulfentrazone	4	F	0.375	lb ai/a	A,B,C	7.3
	COC	100	SL	1	% v/v	A,B,C	
LSD (P=.05)							3.59
Standard Deviation							2.07
CV							25.67

Weed Control in Grape – HTRC 2009

Project Code: WC 132-09-01 **Location: East Lansing, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco
Crop: Grape **Variety: Vitis vinifera**
Planting Method: **Planting Date:**
Spacing: 7 FT in row **Row Spacing: 10 FT**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 6 ft wide x 30 ft long

Soil Type: Sandy Loam **OM: 2.2%** **pH: 6.7**
Sand: 53.5% **Silt: 31.1%** **Clay: 15.4%** **CEC: 6.6**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
EPRE	4/17/09	2:00 pm	65/56	F	Damp	6 NW	30	0% Cloudy	N
EPOS	6/3/09	1:30 pm	64/72	F	Moderate	5 N	46	80% Cloudy	N

Crop and Weed Information at Application

Date	Crop or Weed	Height or Diameter	Growth Stage	Density
4/17	GRAPE		Tight Buds	
4/17	ANBG = annual bluegrass	1-2″		Moderate
4/17	COCW = common chickweed	1-2″	Flower	Many
4/17	MECR = mouseear cress	4-6″	Flower	Moderate
4/17	QUGR = quackgrass	1-2″		Moderate
6/3	GRAPE	12-18″	New Growth	
6/3	ANBG = annual bluegrass	2-3″		Few
6/3	DAND = dandelion	4-5″		Moderate
6/3	HOWE = horseweed (marestail)	8-10″		Few
6/3	WICA = wild carrot	6-12″		Few

Notes and Comments
1. Sprays applied with 2 nozzle shielded boom FF11002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.

Weed Control in Grape – HTRC 2009

Dept. of Horticulture, MSU

Trial ID: WC 132-09-01 Study Director: Dr. Bernard Zandstra
Location: HTRC Investigator: Rodney Tocco

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	GRAPE	ANBG	QUGR	DAND
Pest Code										
Description										
Rating Date							12/May/09	12/May/09	12/May/09	12/May/09
Rating Data Type							RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10
1	Untreated						1.0	3.0	3.7	4.0
	glyphosate	5.5	L	1	lb ai/a	EPOS				
2	diuron	80	DF	3	lb ai/a	EPRE	1.0	9.3	6.0	3.3
	carfentrazone	2	EC	0.062	lb ai/a	EPOS				
3	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	1.0	9.7	10.0	9.7
	glufosinate	1.67	L	1.02	lb ai/a	EPRE,EPOS				
4	sulfentrazone	4	F	0.375	lb ai/a	EPRE	1.0	5.3	5.3	3.0
	Rage 5.04L	5.04	L	20	fl oz/a	EPOS				
5	oryzalin	4	F	4	lb ai/a	EPRE	1.0	6.3	7.0	2.3
	glyphosate	78	DF	1	lb ai/a	EPOS				
6	mesotrione	4	SC	0.188	lb ai/a	EPRE	1.0	2.7	4.0	8.7
	paraquat	2	L	1	lb ai/a	EPOS				
	NIS	100	SL	0.25	% v/v	EPOS				
7	rimsulfuron	25	DF	0.062	lb ai/a	EPRE	1.0	8.0	10.0	8.7
	paraquat	2	L	1	lb ai/a	EPOS				
	NIS	100	SL	0.25	% v/v	EPOS				
8	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	1.0	8.0	7.7	3.7
	paraquat	2	L	1	lb ai/a	EPOS				
	NIS	100	SL	0.25	% v/v	EPOS				
LSD (P=.05)							0.00	3.45	4.81	3.96
Standard Deviation							0.00	1.97	2.75	2.26
CV							0.0	30.09	40.95	41.77

Weed Control in Grape – HTRC 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	GRAPE	ANBG	CABR	DAND	VIPW
Pest Code											
Description											
Rating Date							3/Jun/09	3/Jun/09	3/Jun/09	3/Jun/09	3/Jun/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	Untreated						1.0	3.3	4.0	3.0	7.0
	glyphosate	5.5	L	1	lb ai/a	EPOS					
2	diuron	80	DF	3	lb ai/a	EPRE	1.0	9.7	7.0	5.7	10.0
	carfentrazone	2	EC	0.062	lb ai/a	EPOS					
3	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	1.0	8.7	10.0	7.3	10.0
	glufosinate	1.67	L	1.02	lb ai/a	EPRE,EPOS					
4	sulfentrazone	4	F	0.375	lb ai/a	EPRE	1.0	2.7	7.0	4.0	7.7
	Rage 5.04L	5.04	L	20	fl oz/a	EPOS					
5	oryzalin	4	F	4	lb ai/a	EPRE	1.0	6.3	6.3	3.3	5.3
	glyphosate	78	DF	1	lb ai/a	EPOS					
6	mesotrione	4	SC	0.188	lb ai/a	EPRE	1.0	2.3	4.0	8.0	9.3
	paraquat	2	L	1	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
7	rimsulfuron	25	DF	0.062	lb ai/a	EPRE	1.0	9.0	10.0	9.7	10.0
	paraquat	2	L	1	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
8	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	1.0	6.3	8.0	1.3	10.0
	paraquat	2	L	1	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
LSD (P=.05)							0.00	4.43	7.51	4.91	5.10
Standard Deviation							0.00	2.53	4.29	2.81	2.91
CV							0.0	41.87	60.91	53.03	33.63

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	WICA	GRAPE	LACG	QUGR	COGR
Pest Code											
Description											
Rating Date							3/Jun/09	13/Jul/09	13/Jul/09	13/Jul/09	13/Jul/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
1	Untreated						7.0	1.0	9.3	9.3	7.7
	glyphosate	5.5	L	1	lb ai/a	EPOS					
2	diuron	80	DF	3	lb ai/a	EPRE	6.3	1.0	5.3	5.7	8.0
	carfentrazone	2	EC	0.062	lb ai/a	EPOS					
3	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	7.3	2.0	10.0	10.0	10.0
	glufosinate	1.67	L	1.02	lb ai/a	EPRE,EPOS					
4	sulfentrazone	4	F	0.375	lb ai/a	EPRE	10.0	1.0	9.7	10.0	10.0
	Rage 5.04L	5.04	L	20	fl oz/a	EPOS					
5	oryzalin	4	F	4	lb ai/a	EPRE	6.7	1.0	10.0	10.0	10.0
	glyphosate	78	DF	1	lb ai/a	EPOS					
6	mesotrione	4	SC	0.188	lb ai/a	EPRE	7.0	1.0	8.3	9.0	8.7
	paraquat	2	L	1	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
7	rimsulfuron	25	DF	0.062	lb ai/a	EPRE	10.0	1.0	10.0	10.0	10.0
	paraquat	2	L	1	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
8	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	7.3	1.0	10.0	9.7	10.0
	paraquat	2	L	1	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
LSD (P=.05)							7.34	0.62	1.82	2.79	2.53
Standard Deviation							4.19	0.35	1.04	1.59	1.45
CV							54.39	31.43	11.43	17.27	15.56

Weed Control in Grape – HTRC 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	DAND 13/Jul/09 RATING 1-10	HOWE 13/Jul/09 RATING 1-10	WICA 13/Jul/09 RATING 1-10	GRAPE 24/Aug/09 RATING 1-10	ANBG 24/Aug/09 RATING 1-10
1	Untreated						8.0	10.0	7.0	2.0	6.3
	glyphosate	5.5	L	1	lb ai/a	EPOS					
2	diuron	80	DF	3	lb ai/a	EPRE	4.7	7.0	7.0	1.3	6.0
	carfentrazone	2	EC	0.062	lb ai/a	EPOS					
3	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	8.3	10.0	9.3	1.0	9.7
	glufosinate	1.67	L	1.02	lb ai/a	EPRE,EPOS					
4	sulfentrazone	4	F	0.375	lb ai/a	EPRE	4.7	10.0	8.0	1.3	6.0
	Rage 5.04L	5.04	L	20	fl oz/a	EPOS					
5	oryzalin	4	F	4	lb ai/a	EPRE	3.3	10.0	4.3	1.0	6.7
	glyphosate	78	DF	1	lb ai/a	EPOS					
6	mesotrione	4	SC	0.188	lb ai/a	EPRE	7.7	10.0	9.0	1.0	1.7
	paraquat	2	L	1	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
7	rimsulfuron	25	DF	0.062	lb ai/a	EPRE	5.3	10.0	10.0	1.7	10.0
	paraquat	2	L	1	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
8	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	3.3	9.3	10.0	1.3	7.7
	paraquat	2	L	1	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
LSD (P=.05)							3.99	3.19	4.93	1.33	4.93
Standard Deviation							2.28	1.82	2.81	0.76	2.82
CV							40.18	19.12	34.8	56.99	41.73

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	LACG 24/Aug/09 RATING 1-10	FAPA 24/Aug/09 RATING 1-10	DAND 24/Aug/09 RATING 1-10	HOWE 24/Aug/09 RATING 1-10	WICA 24/Aug/09 RATING 1-10
1	Untreated						7.0	6.3	4.3	10.0	3.7
	glyphosate	5.5	L	1	lb ai/a	EPOS					
2	diuron	80	DF	3	lb ai/a	EPRE	8.3	4.3	6.0	9.3	6.7
	carfentrazone	2	EC	0.062	lb ai/a	EPOS					
3	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	10.0	9.7	10.0	9.0	9.3
	glufosinate	1.67	L	1.02	lb ai/a	EPRE,EPOS					
4	sulfentrazone	4	F	0.375	lb ai/a	EPRE	9.0	8.3	4.0	10.0	8.0
	Rage 5.04L	5.04	L	20	fl oz/a	EPOS					
5	oryzalin	4	F	4	lb ai/a	EPRE	9.3	8.0	4.3	9.7	6.3
	glyphosate	78	DF	1	lb ai/a	EPOS					
6	mesotrione	4	SC	0.188	lb ai/a	EPRE	7.0	7.3	5.7	9.0	8.3
	paraquat	2	L	1	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
7	rimsulfuron	25	DF	0.062	lb ai/a	EPRE	10.0	10.0	8.3	8.7	9.3
	paraquat	2	L	1	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
8	flumioxazin	51	WDG	0.383	lb ai/a	EPRE	10.0	8.0	5.3	9.7	10.0
	paraquat	2	L	1	lb ai/a	EPOS					
	NIS	100	SL	0.25	% v/v	EPOS					
LSD (P=.05)							3.37	4.15	5.18	1.82	4.39
Standard Deviation							1.92	2.37	2.96	1.04	2.51
CV							21.77	30.57	49.27	11.02	32.51

Weed Control in Raspberry – Clarksville 2009

Project Code: WC 131-09-01 **Location: Clarksville, MI**

Personnel: Bernard H. Zandstra, Rodney Tocco, Chad Herrmann
Crop: Raspberry **Variety: Heritage**
Planting Method: Transplant **Planting Date: 5/3/02**
Spacing: Solid row **Row Spacing: 10 FT**
Tillage Type: Conventional **Study Design: RCB** **Replications: 3**
Plot Size: 5.5 ft wide x 30 ft long

Soil Type: Lapeer Sandy Loam **OM: 1.2%** **pH: 7.0**
Sand: 63.0% **Silt: 25.0%** **Clay: 12.0%** **CEC: 7.0**

Herbicide Application Information

Timing	Date	Time	Air/Soil	T	Soil Surf	Wind	RH	Sky	Dew
EPRE	4/29/09	1:30 pm	55/51	F	Damp	8 NE	42	100% Cloudy	N
PO1	6/24/09	3:00 pm	95/85	F	Dry	2 SW	34	10% Cloudy	N

Crop and Weed Information at Application

		Height or Diameter	Growth Stage	Density
4/29	RASPBERRY		Dormant	
6/24	RASPBERRY	12-24″		
6/24	QUGR = quackgrass	12-24″		Moderate
6/24	ROFB = rough fleabane	12-18″		Few

Notes and Comments
1. Sprays applied with 4 nozzle boom FF8002, 20 gpa, 30 psi, 3.2 mph, CO_2 backpack sprayer.
2. Crop and weed injury ratings on scale of 1-10: 1 = no injury, 10 = complete kill.

Weed Control in Raspberry – Clarksville 2009

Dept. of Horticulture, MSU

Trial ID: WC 131-09-01 Study Director: Dr. Bernard Zandstra
Location: CHES Investigator: Rodney Tocco

Pest Code								TAFE	QUGR	DOBR	WHCA
Description							Raspberry				
Rating Date							18/Jun/09	18/Jun/09	18/Jun/09	18/Jun/09	18/Jun/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING
Rating Unit							1-10	1-10	1-10	1-10	1-10
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage	1	2	3	4	5
1	terbacil	80	WP	2	lb ai/a	EPRE	1.0	9.0	9.7	10.0	10.0
2	mesotrione	4	SC	0.188	lb ai/a	EPRE	2.3	5.7	4.0	7.7	9.3
3	flumioxazin	51	WDG	0.192	lb ai/a	EPRE	3.0	4.0	4.0	7.3	5.3
4	s-metolachlor	7.62	EC	1.9	lb ai/a	EPRE	1.3	6.3	6.7	7.0	4.7
	clopyralid	3	EC	0.125	lb ai/a	LPOS					
	sethoxydim	1.53	EC	0.19	lb ai/a	LPOS					
5	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	2.0	6.3	3.7	8.0	5.3
6	diuron	80	DF	3	lb ai/a	EPRE	2.0	7.7	8.0	10.0	5.3
LSD (P=.05)							1.31	4.08	5.26	6.63	5.30
Standard Deviation							0.72	2.24	2.89	3.65	2.92
CV							37.16	34.52	48.21	43.76	43.73

Pest Code								TAFE	QUGR	DAND	WHCA	
Description							Raspberry					Raspberry
Rating Date							7/Jul/09	7/Jul/09	7/Jul/09	7/Jul/09	7/Jul/09	4/Sep/09
Rating Data Type							RATING	RATING	RATING	RATING	RATING	HARVEST
Rating Unit							1-10	1-10	1-10	1-10	1-10	KG
Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit	Growth Stage						
1	terbacil	80	WP	2	lb ai/a	EPRE	1.3	6.7	5.7	6.7	9.3	1.401
2	mesotrione	4	SC	0.188	lb ai/a	EPRE	3.3	6.0	3.7	7.3	9.0	0.196
3	flumioxazin	51	WDG	0.192	lb ai/a	EPRE	3.0	6.3	6.3	7.7	4.3	0.699
4	s-metolachlor	7.62	EC	1.9	lb ai/a	EPRE	2.7	6.3	8.3	8.3	5.0	1.087
	clopyralid	3	EC	0.125	lb ai/a	LPOS						
	sethoxydim	1.53	EC	0.19	lb ai/a	LPOS						
5	BCS AA 10717	1.67	L	0.067	lb ai/a	EPRE	2.3	8.0	4.3	7.3	5.7	1.188
6	diuron	80	DF	3	lb ai/a	EPRE	2.0	8.3	7.3	6.0	5.3	1.192
LSD (P=.05)							0.72	4.92	5.41	2.96	6.57	1.2983
Standard Deviation							0.39	2.71	2.98	1.63	3.61	0.7137
CV							16.13	38.97	50.06	22.56	56.07	74.31

Weed Control in Raspberry – Clarksville 2009

Dept. of Horticulture, MSU

Trt No.	Treatment Name	Form Conc	Form Type	Rate	Rate Unit		Raspberry 9/Sep/09 HARVEST KG	Raspberry 14/Sep/09 HARVEST KG	Raspberry 18/Sep/09 HARVEST KG	Raspberry 24/Sep/09 HARVEST KG	Raspberry 30/Sep/09 HARVEST KG	Raspberry TOTAL KG
1	terbacil	80	WP	2	lb ai/a	14.079	1.620	2.746	2.467	3.915	1.930	14.079
2	mesotrione	4	SC	0.188	lb ai/a	5.366	0.413	0.964	0.806	1.778	1.208	5.366
3	flumioxazin	51	WDG	0.192	lb ai/a	7.136	0.914	1.326	1.008	2.100	1.088	7.136
4	s-metolachlor	7.62	EC	1.9	lb ai/a	14.673	2.154	3.249	2.762	4.078	1.343	14.673
	clopyralid	3	EC	0.125	lb ai/a							
	sethoxydim	1.53	EC	0.19	lb ai/a							
5	BCS AA 10717	1.67	L	0.067	lb ai/a	11.872	1.628	2.729	1.845	2.987	1.497	11.872
6	diuron	80	DF	3	lb ai/a	11.629	1.360	2.568	2.144	2.653	1.712	11.629
LSD (P=.05)							1.2173	1.1446	0.7513	2.0214	1.3792	4.3875
Standard Deviation							0.6692	0.6292	0.4130	1.1112	0.7582	2.4118
CV							49.64	27.79	22.46	38.07	51.82	22.35