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Identifying & Managing Spotted Spurge (*Chamaesyce maculata*) in Nurseries & Greenhouses

Chamaesyce maculata or *Euphorbia maculata* is commonly known as spotted spurge or spotted sandmat. It is a common broadleaf weed in nursery containers, landscapes, greenhouses, gardens, lawns, field crops, and noncrop areas. The low-growing summer annual with spotted leaves is a member of the plant family Euphorbiaceae (Young, 2012). Spotted spurge is native to North America and grows throughout the United States (Molinar et al., 2009). This bulletin will help growers identify spotted spurge, understand its biology, and develop strategies for managing it.

BIOLOGY & IDENTIFICATION

HABITAT

Spotted spurge grows in a wide range of habitats, including vegetable and other crop fields, lawns, citrus groves, ornamental beds, gardens, container nurseries, sidewalk and parking lot cracks and edges, parks, athletic fields, and greenhouses. It spreads best in sunny conditions and in a variety of soils (Molinar et al., 2009; Landschoot et al., 2020).

GROWTH HABIT

Spotted spurge is a low-growing, mat-forming summer annual that emerges in early to mid-summer. It has small (less than 0.5 inches long) linear or egg-shaped leaves that are arranged in opposite pairs. The leaves often have a dark red, purple, or maroon spot in the center. The stems grow up to 2 feet long and no more than a few inches high (Mahr, 2021). Individual plants tend to grow outward radially from a central growth point (Figure 1; Landschoot et al., 2020).

AUTHORS & CREDITS

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SEEDLINGS

Seeds of spotted spurge germinate best when temperatures are between 75 °F and 85 °F; however, it has been observed that germination can occur at temperatures as low as 60 °F and as high as 100 °F (Molinar et al., 2009). Spurge seeds won't sprout without light or if they're buried more than 0.5 inches deep (Mahr, 2021). The seedlings are green or reddish. The plants grow and develop slowly and become noticeable only in mid- or late summer.

ROOTS

Mature plants form tap roots at their central growth points that can extend 24 inches into the soil (Molinar et al., 2009). Stems do not form roots at the nodes (Landschoot et al., 2020).

SHOOTS

Spotted spurge has reddish, branched stems with fine hairs (Figure 2). If broken or punctured, the stems secrete a milky-white, sticky sap that is poisonous and can irritate human skin and eyes (Figure 3). The leaves have short petioles, are arranged in opposite pairs and are unequal (Landschoot et al., 2020). They are small; oblong; dark green with purple, maroon, or red spots in the center on more than 95% of leaves; hairy, smooth, or finely toothed; mostly rounded at the tips; and about 0.5 inch long (Figure 2; Molinar et al., 2009).

FLOWERS & FLOWERING

Under ideal conditions, spotted spurge begins to flower just one month after germination (Mahr, 2021). The plants are monoecious (have female and male flowers on the same plant) and produce tiny white and pink flowers in the leaf axils.

Flowers consist of only stamens and hairy pistils that have white to pink petallike appendages. They are grouped in cuplike structures known as *cyathia* (Figure 4) (Molinar et al., 2009).

Figure 1: A mature spotted spurge (*Chamaesyce maculata*) plant growing on container media surface.
(Photo: Debalina Saha, MSU Department of Horticulture)

Figure 2: The reddish stems of spotted spurge are covered with fine hairs. The opposite leaves have a dark spot along the middle vein that varies from purple to maroon or red.
(Photo: Debalina Saha, MSU Department of Horticulture)

FRUIT & SEEDS

Spotted spurge may start producing fruits and seeds one month after flowering, under ideal conditions (Mahr, 2021). The fruit is hairy with a three-chambered capsule that is about 1/16 inch long, with one seed in each chamber. Each seed is about 0.019 inch wide and 0.039 inch long. The seeds are wrinkled and light brown (Mahr, 2021; Young, 2012; Molinar et al., 2009).

Spotted spurge reproduces via seed (Unruh, 2013). Under ideal conditions, one plant can produce thousands of seeds, at a rate of about 500 seeds per square foot of mat (Young, 2012). Seeds produced in early or midsummer may sprout immediately, while those produced in late summer or fall may not sprout until the next spring or summer (Mahr, 2021; Landschoot et al., 2020). As mentioned earlier, the seeds need light to germinate, so they won't sprout if they're buried more than about 0.5 inches deep (Molinar et al., 2009).

The sticky seeds are dispersed by the wind, ants, and the animal fur, shoes, clothes, lawn mower tires, and tools they cling to (Young, 2012; Mahr, 2021).

SIMILAR SPECIES

Hartzler & Vittetoe (2021) note that many spurge species are similar to spotted spurge:

- **Erect or hyssop spurge** (*Chamaesyce hyssopifolia*) is an upright plant with smooth stems that branch at the upper nodes. Leaves are oblong to linear with toothed margins. Seeds vary from gray to brown and have broad, shallow depressions with low ridges on the surface.
- **Garden spurge** (*E. hirta*) has a prostrate growth habit but its leaves are less rounded and bigger than those of spotted spurge.
- **Ground spurge** (*Euphorbia prostrata*) has shorter, rounder leaves than spotted spurge, no markings on its leaves, and roots at the stem nodes. Seeds are white to gray with sharp surface ridges.
- **Matted spurge** (*E. serpens*) has very short, rounded leaves but larger cyathias than spotted spurge.
- **Petty spurge** (*E. peplus*) is a cool-season annual, upright spurge that is native to Europe.
- **Prostrate spurge** (*E. humistrata*) has prostrate, freely branched stems with roots at the stem nodes. Leaves are light green and asymmetrical and usually have a reddish blotch in the center.

Figure 3: Milky-white sap oozing from severed spotted spurge stems. Contact with the sap can irritate human skin.
(Photo: Peter Landschoot, Penn State Extension)

Figure 4: The flowers and fruits of spotted spurge.
(Photo: Susan Mahr, University of Wisconsin—Madison)

MANAGEMENT

Scouting for spurge is important for control and growers need to remove it and any other weeds soon after they appear. Growers also need to check that planting material is free of weeds and plant only in weed-free substrates.

PHYSICAL & CULTURAL CONTROL

Use hand weeding or mechanical tilling to remove spurge plants before they set seed. Remember to wear gloves while hand weeding because the plant sap is a skin irritant (Landschoot et al., 2020).

The following practices will help control the spread of spotted spurge:

- Avoid walking through spurge mats.
- Avoid raking uprooted or mature spurge plants across the soil surface and dispose of dead spurge plants carefully.
- Wash or otherwise clean tools after each use to remove any spurge seeds.
- Keep irrigation systems in proper working order to avoid creating unwanted wet areas that promote spurge infestations (Young, 2012).
- Mulch nursery containers with organic materials such as shredded bark, compost, or straw up to 2 inches deep to help suppress seed germination (Molinar et al., 2009).

CHEMICAL CONTROL

Spotted spurge can be controlled with preemergence or postemergence herbicides that are labeled for such use. Always read and follow the label directions. Always wear the recommended personal protective equipment when working with pesticides.

Preemergence Control

Preemergent herbicides that are labelled for controlling spotted spurge must be applied before seeds have germinated because they don't work after seeds have germinated or seedlings have emerged. Preemergent herbicides are most

Table 1. Preemergence herbicides that are labeled for use in ornamental crop production and have shown good control of spotted spurge (*Chamaesyce maculata*).

Common name (active ingredient)	Trade names & formulations	Container & field production	Greenhouse or fully enclosed structures
Dithiopyr	▪ Dimension 2EW ▪ Dithiopyr 40WSB	Yes	No
Isoxaben	Gallery 75DF	Yes	No
Pendimethalin	▪ Pendulum 3.3 EC ▪ Lesco Pre-M ▪ Lesco Pre-M AquaCap	Yes	No
Prodiamine	Barricade 4FL	Yes	Yes
Prodiamine	▪ Barricade 65WG ▪ Prodiamine 4L ▪ Prodiamine 65WG	Yes	No

Note. See manufacturers' label for application method and timing, dose, safety recommendations, restrictions, and storage of herbicides. Adapted from *Lawn and Turfgrass Weeds: Spotted Spurge* —Chamaesyce Maculata *L.*, by P. Landschoot, T., Abbey, and T. Delvalle, 2020, "Management and Control" section (https://bit.ly/34XbLzg).

Table 2. Postemergence herbicides labeled for use in ornamental crop production for spotted spurge (*Chamaesyce maculata*) control.

Common name (active ingredient)	Trade name & formulation	Efficacy (C = good control, S = suppression)	Field container production	Greenhouse or fully enclosed structures
2,4-D & 2,4-DP	Patron 170 (ester formulation)	C	Yes	No
2,4-D, 2,4-DP & dicamba	Super Trimec (ester formulation)	C	Yes	No
2,4-D, clopyralid & dicamba	Millennium Ultra 2	S	Yes	No
2,4-D, fluroxypyr & dicamba	Escalade 2 Herbicide	C	Yes	No
2,4-D, fluroxypyr, triclopyr & flumioxazin	Sure Power (ester formulation)	C	Yes	No
2,4-D, MCPP & dicamba	▪ Trimec Classic ▪ 3-D Herbicide ▪ Primera Triplet SF ▪ Threesome ▪ Three Way	C	Yes	No
2,4-D, MCPP, dicamba & carfentrazone-ethyl	Speedzone	C	Yes	No
2,4-D, MCPP, dicamba & sulfentrazone	Surge	C	Yes	No
2,4-D, quinclorac, dicamba & sulfentrazone	Q4 Plus	C	Yes	No
2,4-D & triclopyr	Chaser 2 Amine	C	Yes	No
2,4-D, fluroxypyr & triclopyr	Momentum FX2	S	Yes	No
2,4-D, fluroxypyr, triclopyr & sulfentrazone	Momentun 4-Score	C	Yes	No
2,4-D, triclopyr, dicamba & pyraflufen-ethyl	4-Speed XT (ester formulation)	C	Yes	No
Fluroxypyr	Vista XRT	C	Yes	No
MCPA, fluroxypyr & dicamba	Change Up	C	Yes	No
MCPA, fluroxypyr & triclopyr	Battleship III	C	Yes	No
MCPA, MCPP & dicamba	Trimec Encore	C	Yes	No
MCPA, MCPP, dicamba & carfentrazone-ethyl	Powerzone (ester formulation)	C	Yes	No
MCPA, triclopyr & dicamba	▪ Lesco Three-Way Ester II ▪ Cool Power (ester formulation) ▪ Horsepower	C	Yes	No

Note. See manufacturers' label for application method and timing, dose, safety recommendations, restrictions, and storage of herbicides. Adapted from *Lawn and Turfgrass Weeds: Spotted Spurge* —Chamaesyce Maculata *L.*, by P. Landschoot, T., Abbey, and T. Delvalle, 2020, "Management and Control" section (https://bit.ly/34XbLzg).

effective against spurge if applied before the soil temperature rises to 60 °F. Products should be applied in spring and then again in mid-summer according to label instructions (Young, 2012). Preemergent herbicides can be used in areas with ongoing spotted spurge problems and where mulching is impractical. Only use them in vegetable crops if they are labeled for such use (Mahr, 2021). Table 1 (p. 4) lists the preemergence herbicides labeled for control of spotted spurge control in ornamental crop production.

Postemergence Control

To control existing spotted spurge, apply a postemergent herbicide to plant foliage that contains a combination of one or more of the following active ingredients: 2,4-D; MCPP; dicamba; and fluroxypyr. These compounds don't work when applied to soil or seeds, and won't prevent seed germination or seedling emergence (Young, 2012; Landschoot et al., 2020). Table 2 (p. 5) lists several postemergent herbicides that are labeled for spotted spurge control. Nonselective herbicides such as glyphosate can also be used to control larger spurge plants, taking care to avoid contact with desirable ornamental plants (Mahr, 2021). Use caution when applying any product to avoid spray drift and damage to desirable plants.

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