



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative



Feed the Future Africa Great Lakes Region Coffee Support Program (AGLC) Policy Roundtable

Topic: Ensuring Farmers have Timely

Access to Improved Inputs

May 2016 • Kigali, Rwanda



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Institute of Policy Analysis
and Research - Rwanda

Introduction to the Challenge

AGLC Background

- **AGLC is a 3-year USAID-funded initiative that addresses 2 major challenges in the coffee sector in Rwanda (and the Africa Great Lakes region)**
 - Reduce antestia bug/potato taste defect (PTD)
 - Raise coffee productivity
- **Partners**
 - Rwanda: Inst. of Policy Analysis and Research (IPAR) and Univ. of Rwanda (UR)
 - USA: Michigan State University (MSU) and Global Knowledge Initiative (GKI)
 - Numerous public and private sector partners
- **Components: • applied research • policy engagement • capacity building**

Applied research component

- **AGLC draws upon a broad mix of quantitative and qualitative methodologies, including:**
 - Coffee farmer/household surveys (and CWS survey)
 - Experimental field/plot level data collection
 - Key Informant Interviews
 - Focus Group Discussions
- **Comprehensive coffee sector data base**
 - Goal to integrate information from these four data collection activities
 - Provide empirical basis for policy engagement and farmer capacity building

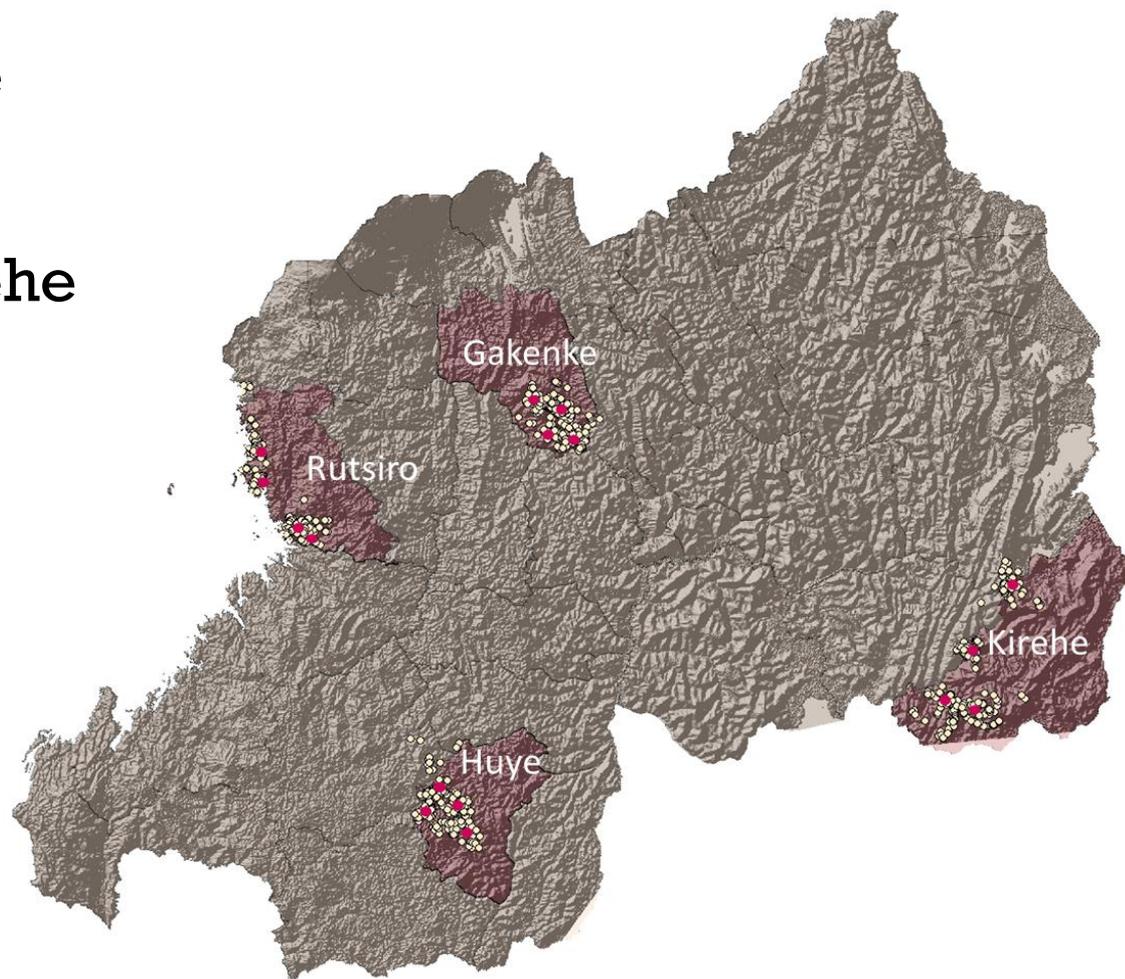
Guiding question:

How might we ensure that farmers will have adequate and timely access to improved inputs (fertilizers & pesticides)?

Methodology

Baseline survey of coffee growers

- Geographically dispersed sample across four coffee growing districts: Rutsiro, Huye, Kirehe and Gakanke.
- 4 CWSs in each District (2 cooperatives, 2 private)
- 64 HHs randomly selected from listings of each of the 16 CWSs
 - (64 x 16 = 1,024 HHs)



Baseline survey, cont.

- Focus on fully-washed coffee. Sample does not include HHs not on CWS listings
 - Advantage: In depth focus on core of Rwanda's coffee sector strategy (Fully-washed coffee)
 - Disadvantage: Ordinary coffee (parchment) producers underrepresented
- Survey instrument includes diversity of topics:
 - coffee growing practices • antestia control practices • cost of production • coffee field size • number of trees • slope • location (GPS) • cherry production & cherry sales • landholding • equipment & assets • household income • barriers to investment in coffee • basic household demographics
- Programmed (in *CSPPro*) on 7" tablets for data collection
- 10 enumerators (working in 2 teams of 5)

Qualitative Data

- **Key informant interviews**
 - Key coffee sector leaders including public sector representatives, farmer organizations, and private sector stakeholders.
 - Focused on challenges identified by stakeholders and provided insights into critical areas of convergence and disagreement among various specialty coffee sector stakeholder groups.
- **Focus group discussions**
 - Held with major coffee stakeholder groups including coffee farmers, washing station managers, coffee exporters, others.
 - Groups of 5-7 members of each stakeholder group

Fieldwork



Focus group discussion with farmers at Buf Café washing station

AGLC Baseline survey interview with farmer in Gakenke



Overview parameters of sample

- **Gender of Head of HH**
 - 81.5% Male
 - 18.5% Female
- **Head of HH completed primary school: 38.1%**
- **Mean age of head of HH: 51 years**
- **Median number coffee trees on farm: 400**
- **Head of HH member of cooperative: 55.4%**
- **Median cherry produced in 2015: 600 Kg**
- **Mean cherry price received in 2015: 198 RWF**
- **Median HH cash income: 340,000 RWF**
- **Share of total cash income from coffee: 44%**
- **Percent of coffee farmers reporting antestia: 55%**

Research Findings

Sub-questions addressed in findings

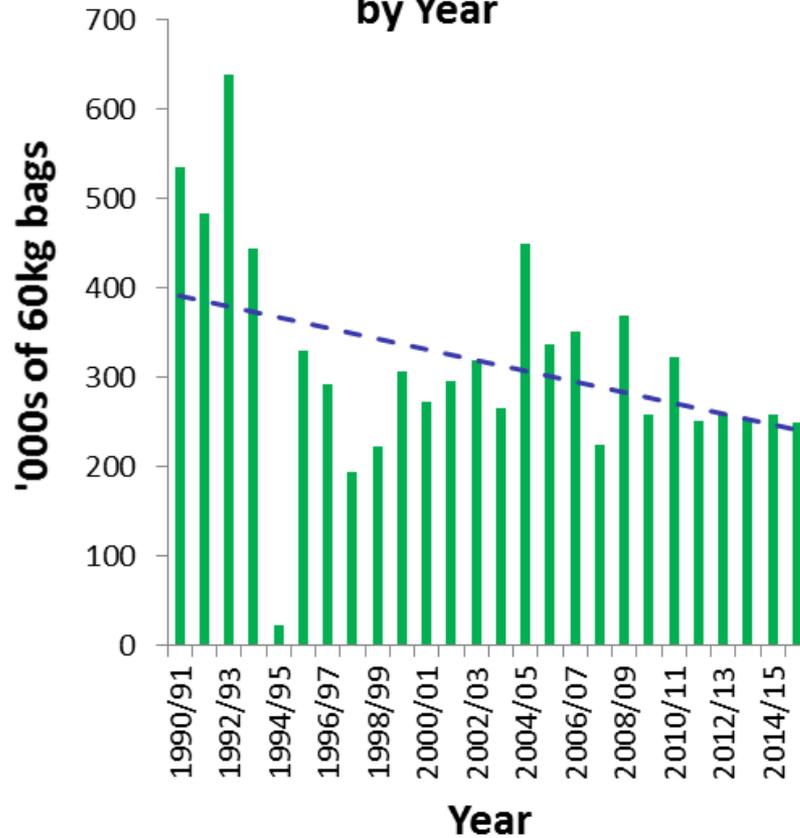
1. How does coffee productivity in Rwanda compare with other countries in the region?
2. Do coffee farmers see access to inputs as a barrier to investment in coffee?
3. What percentage of farmers receive/apply inputs?
4. In what months do farmers apply inputs?
5. Do farmers apply the recommended dose of fertilizers and pesticides?
6. Do farmers favor some fields more than other in their application of inputs?
7. What are the determinants of access to input distributions?
8. What is the impact of fertilizer distributions on productivity?

Premises to challenge

1. Long-term success of the sector depends on growth in production and productivity.
2. Farmer access to improved inputs (fertilizers and pesticides) is critical to their ability to improve productivity.
3. The timing of input distribution & application is key to effective usage

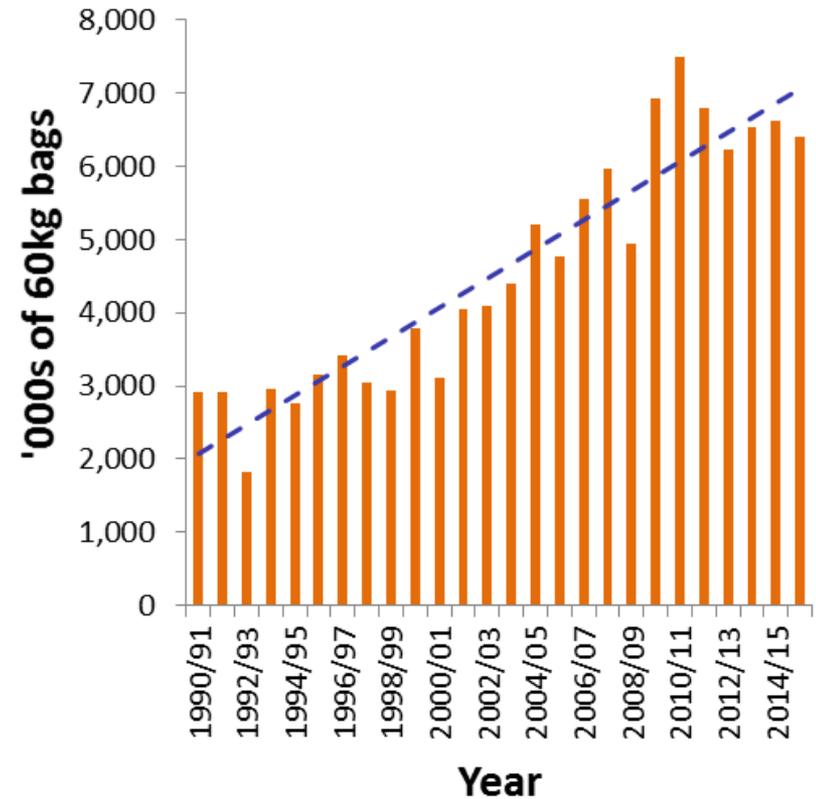
Trends in coffee production

Rwanda Green Coffee Production by Year



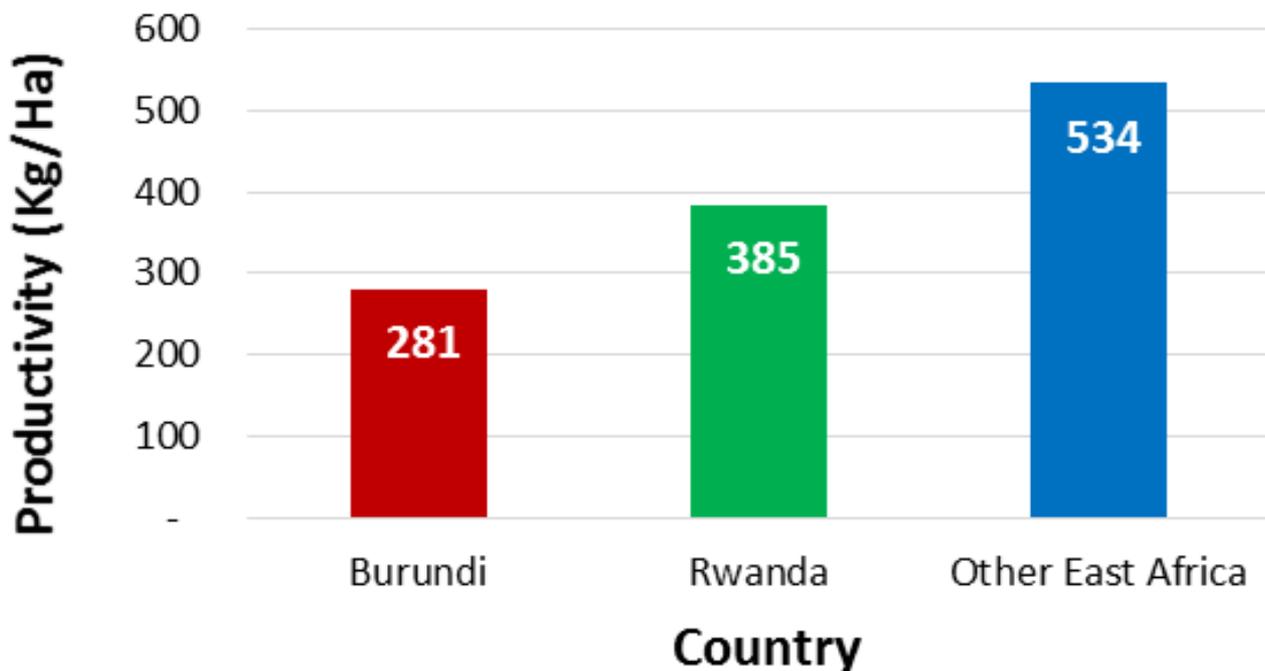
Source: International Coffee Organisation (ICO)

Ethiopia Green Coffee Production by Year



Source: International Coffee Organisation (ICO)

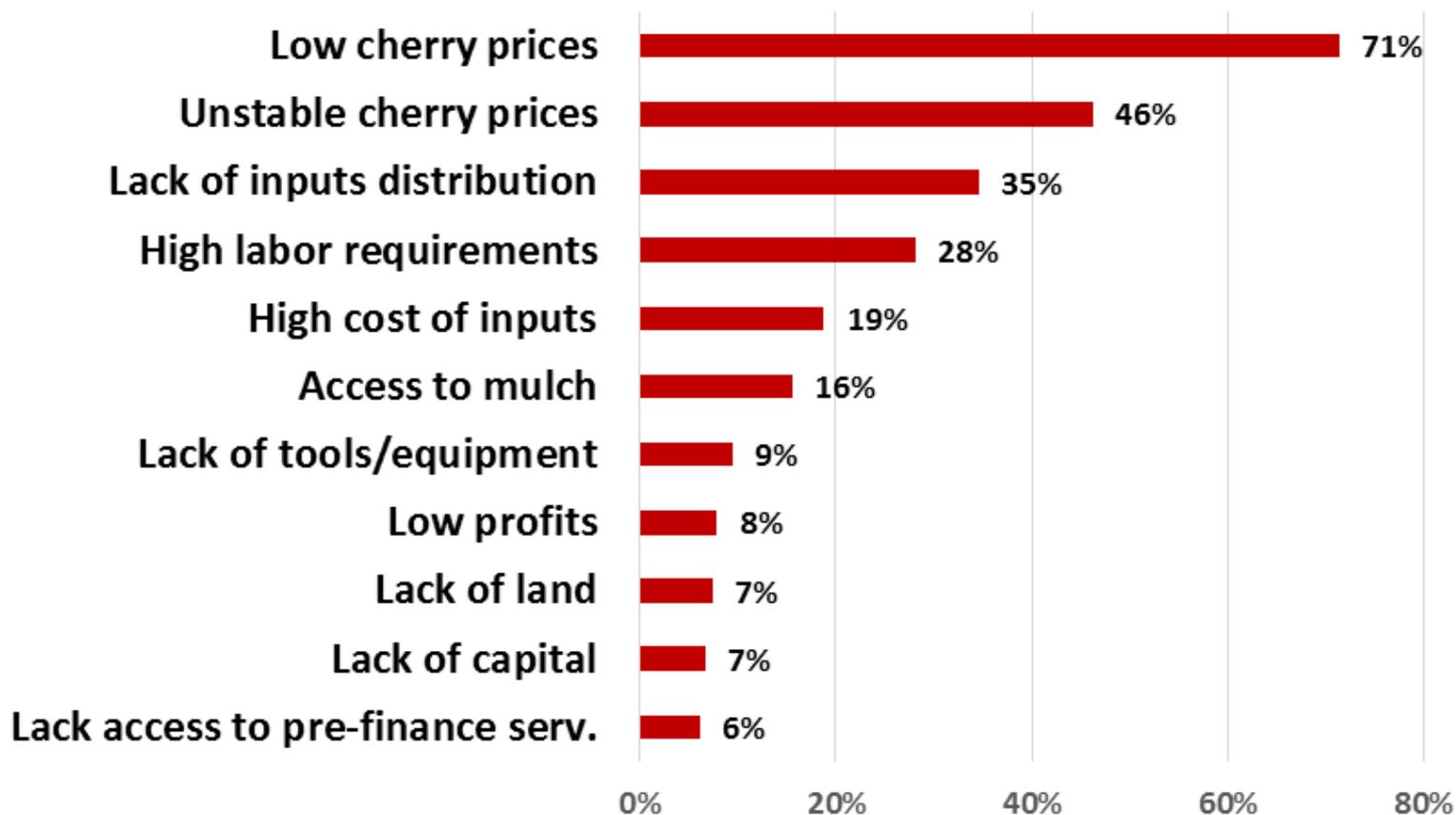
Average Coffee Productivity (Green Coffee Kg/Ha) by Country 2010/11 to 2013/14



Source: International Coffee Organization (ICO)

Primary Barriers to Investment in Coffee Identified by Coffee Growing Households

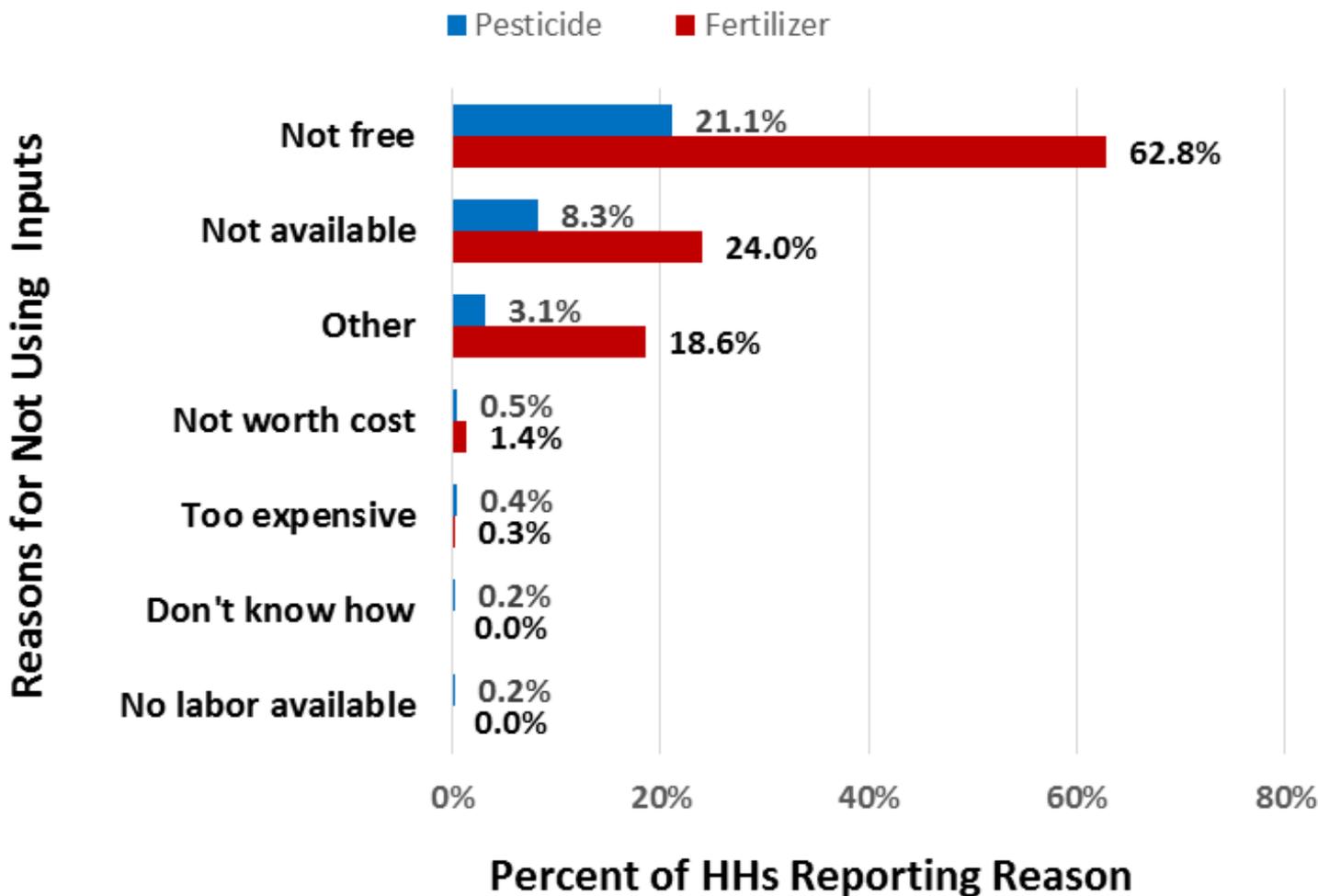
Barriers to Investment in Coffee



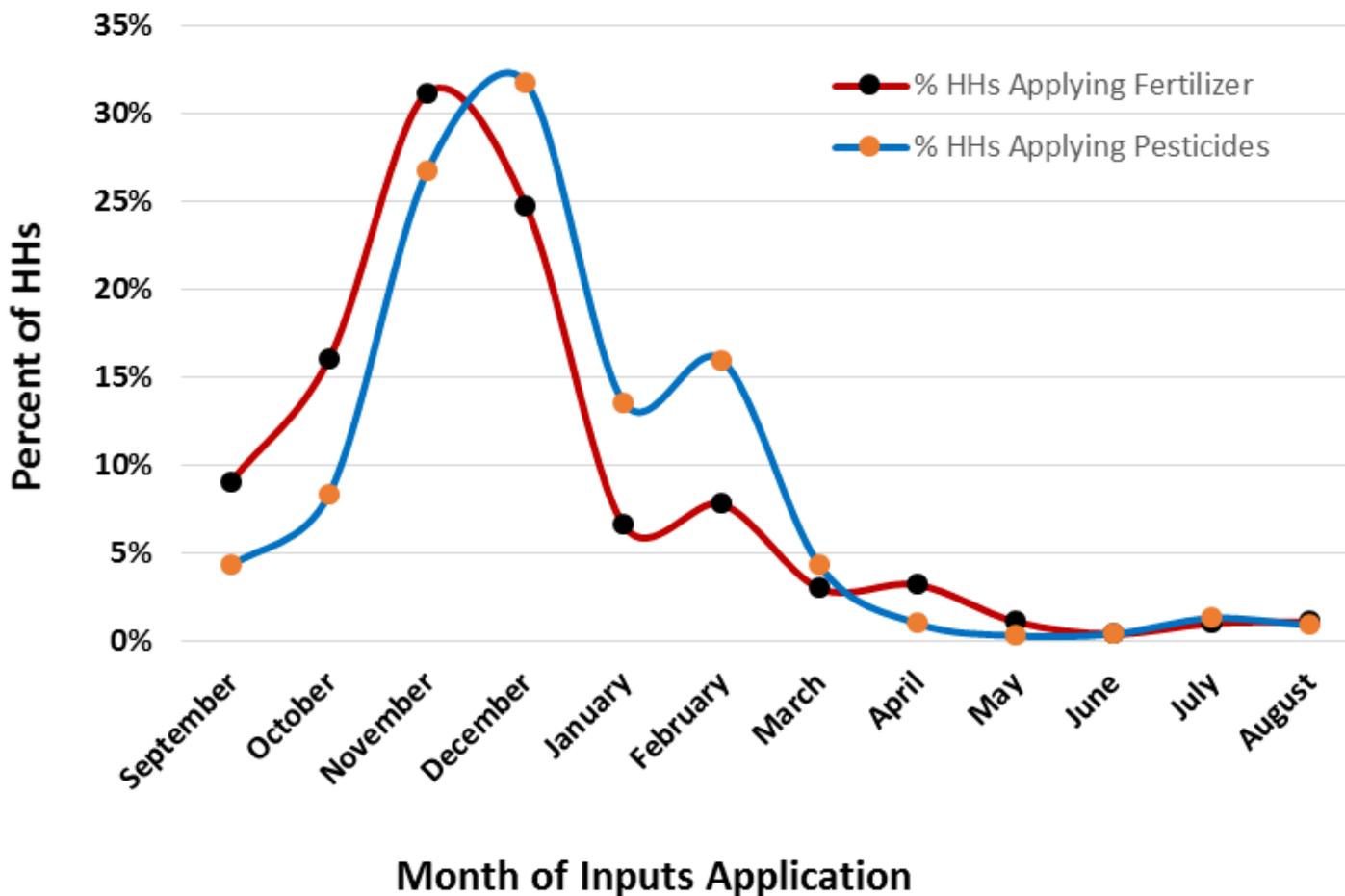
Percent of Households Applying Inputs

	Applied fertilizers	Applied pesticides	Applied manure
No	29.0	31.2	40.6
Yes	71.0	68.8	59.4
Total	100.0	100.0	100.0
N	1,024	1,024	1,024

Reasons for Not Using Fertilizers and Pesticides (for HHs not using inputs)



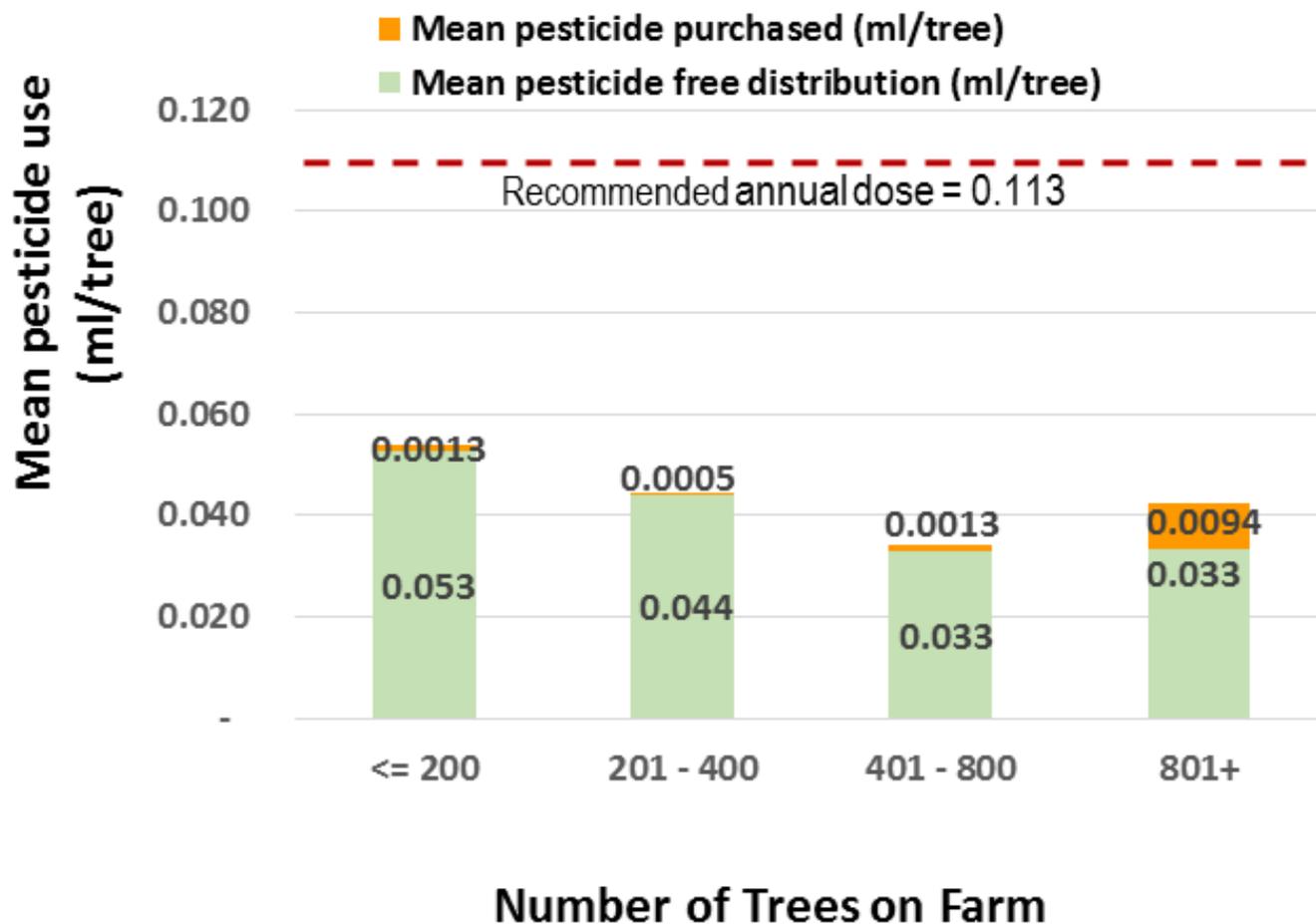
Percent of Farmers Applying Inputs by Month



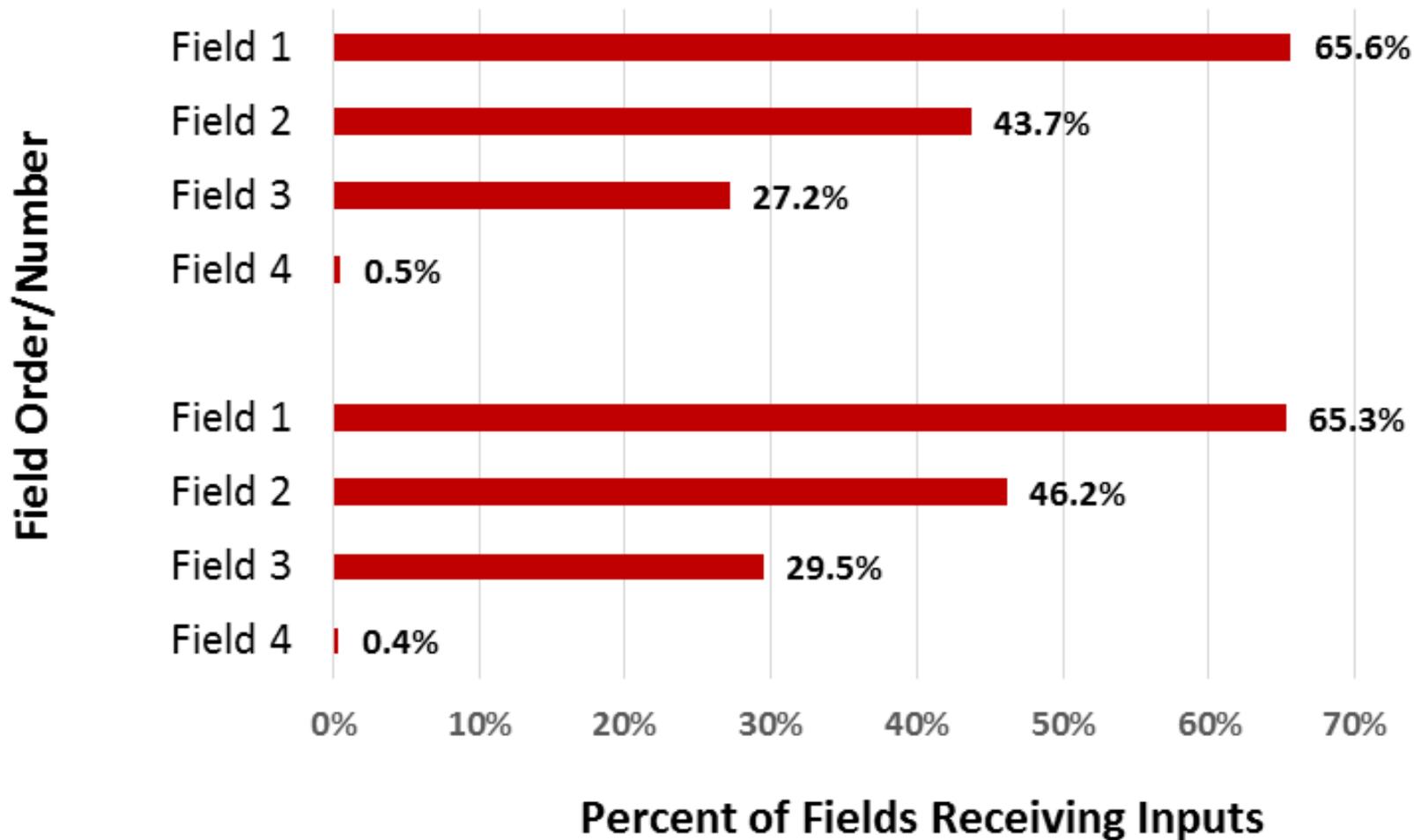
Fertilizer Use Per Tree by Source and Number of Trees on Farm



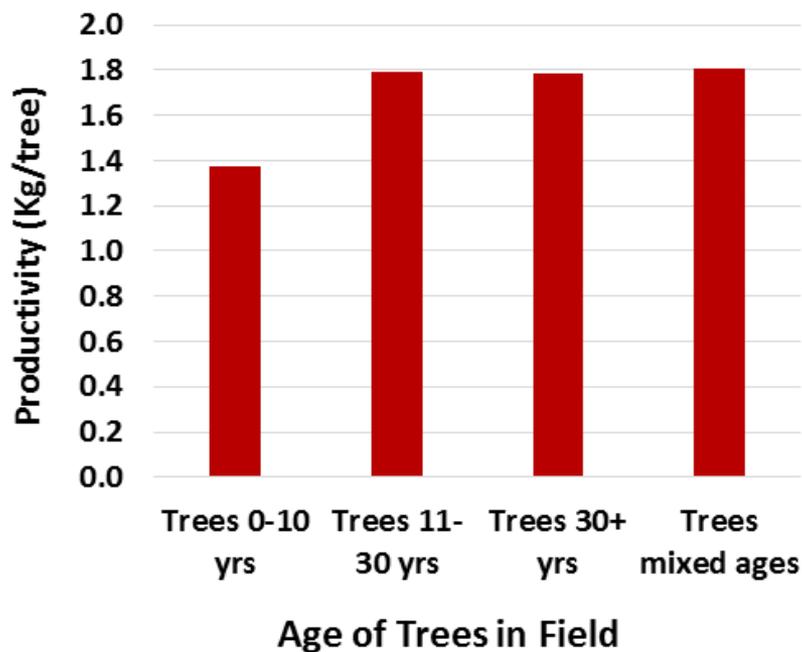
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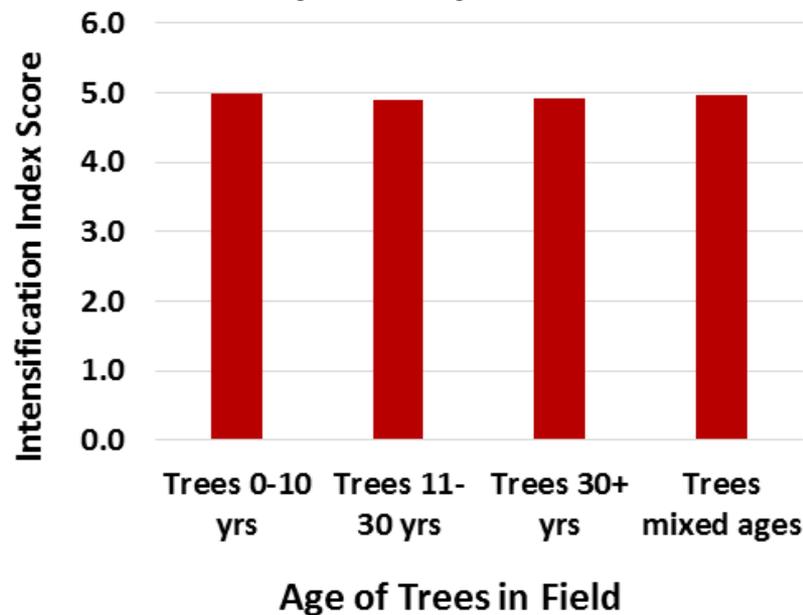
Inputs Application by Order of Field *(reflecting distance from residence)*



Productivity (Kg/Tree) by Age of Trees in Field (ANOVA)



Best Practices Intensification Index by Age of Trees in Field (ANOVA)



Inputs Distributions by Selected Farm, Household and Ecological Characteristics

OLS Model	B	SE	Beta	t	Sig.
<u>Fertilizer distribution (gm/tree) (N=1,004)</u>					
Number of productive trees	-0.009	0.003	-0.115	-3.194	0.001 **
CWS private or cooperative	9.516	4.673	0.066	2.036	0.042 **
Member of coop	-4.506	4.792	-0.031	-0.940	0.347
Total land owned (ha)	0.001	0.000	0.076	1.972	0.049 **
Income 2015 (not including coffee)	0.000	0.000	0.072	1.987	0.047 **
Gender of HHH	-5.041	6.164	-0.027	-0.818	0.414
Age of HHH	0.028	0.176	0.005	0.159	0.873
Active adults in HH	-1.048	1.519	-0.023	-0.690	0.490
Education of HHH	3.572	2.275	0.055	1.570	0.117
Elevation of HH (m)	0.047	0.014	0.106	3.328	0.001 **
(Constant)	-41.624	27.382		-1.520	0.129

*Sig. at 10% level; **Sig. at 5% level; ***Sig. at 1% level

Inputs Distributions by Selected Farm, Household and Ecological Characteristics

OLS Model	B	SE	Beta	t	Sig.
<u>Pesticide distribution (ml/tree) (N=1,004)</u>					
Number of productive trees	0.000	0.000	-0.095	-2.613	0.009 **
CWS private or cooperative	-0.026	0.009	-0.090	-2.786	0.005 **
Member of coop	0.036	0.010	0.123	3.737	0.000 ***
Total land owned (ha)	0.000	0.000	-0.043	-1.118	0.264
Income 2015 (not including coffee)	0.000	0.000	0.041	1.142	0.254
Gender of HHH	0.002	0.012	0.006	0.192	0.848
Age of HHH	0.000	0.000	-0.026	-0.744	0.457
Active adults in HH	-0.002	0.003	-0.025	-0.746	0.456
Education of HHH	0.000	0.005	-0.001	-0.039	0.969
Elevation of HH (m)	0.000	0.000	-0.006	-0.178	0.859
(Constant)	0.113	0.055		2.037	0.042

*Sig. at 10% level; **Sig. at 5% level; ***Sig. at 1% level

Productivity per Tree (Kg cherry) by Amount of Fertilizer Received through Free Distribution by Selected Determinants/Covariates

OLS Model: Productivity (Kg/Tree)	B	Std. Error	Beta	t	Sig.
Fertilizer per tree (distributed)	0.003	0.001	0.135	4.270	0.000 ***
Pesticide per tree (distributed)	1.108	0.327	0.106	3.390	0.001 ***
Income 2015 (not including coffee)	0.000	0.000	0.041	1.138	0.255
Total land owned	0.000	0.000	-0.027	-0.769	0.442
Age of HHH	0.001	0.003	0.014	0.404	0.686
Education of HHH	0.088	0.041	0.075	2.156	0.031 **
Active adults in HH	0.015	0.027	0.018	0.540	0.589
Gender of HHH	-0.203	0.110	-0.060	-1.839	0.066 *
Elevation of HH (m)	0.000	0.000	0.056	1.779	0.075 *
(Constant)	0.727	0.489		1.485	0.138

*Sig. at 10% level; **Sig. at 5% level; ***Sig. at 1% level

Summary and discussion points

Recap of challenge and findings

1. Long-term success of the coffee sector (all stakeholders) depends on growth in production and productivity
2. Rwanda's productivity is among the lowest in East Africa (and in the world)
3. Access to inputs is a critical factor in raising productivity
4. Coffee farmers rarely purchase fertilizer or pesticides (4% fert; 2.5% pest) and only in very small amounts
5. CEPAR/NAEB distribution virtually the sole source of inputs
6. Distribution of inputs is far below the recommended dose per tree ($1/6^{\text{th}}$ of fertilizer dose; $1/3$ of pesticide dose)
7. Despite low dose, distributed inputs do show a modest positive impact on productivity
8. Relatively equitable distribution (within this sample) of inputs, modestly higher (per tree) to coop CWSs (fert) and coop members (pest)

Discussion questions

- What do we conclude from the data?
- How can we better articulate the challenge and what else do we need to know?
- What are the major policy levers that can help raise access and use of inputs?
- How might we encourage stakeholders to work together to ensure greater inputs access and use?



Thank You!