



## LTRA-06 Update, 2014

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23 May 2014

# Haiti

- Poorest country in the W. Hemisphere:  
GDP \$1,300/person/yr
- 54% of population below poverty line
- 60% of population involved in  
agriculture
- Climate: Tropical, rainy season April-  
Nov.

**HAITI**

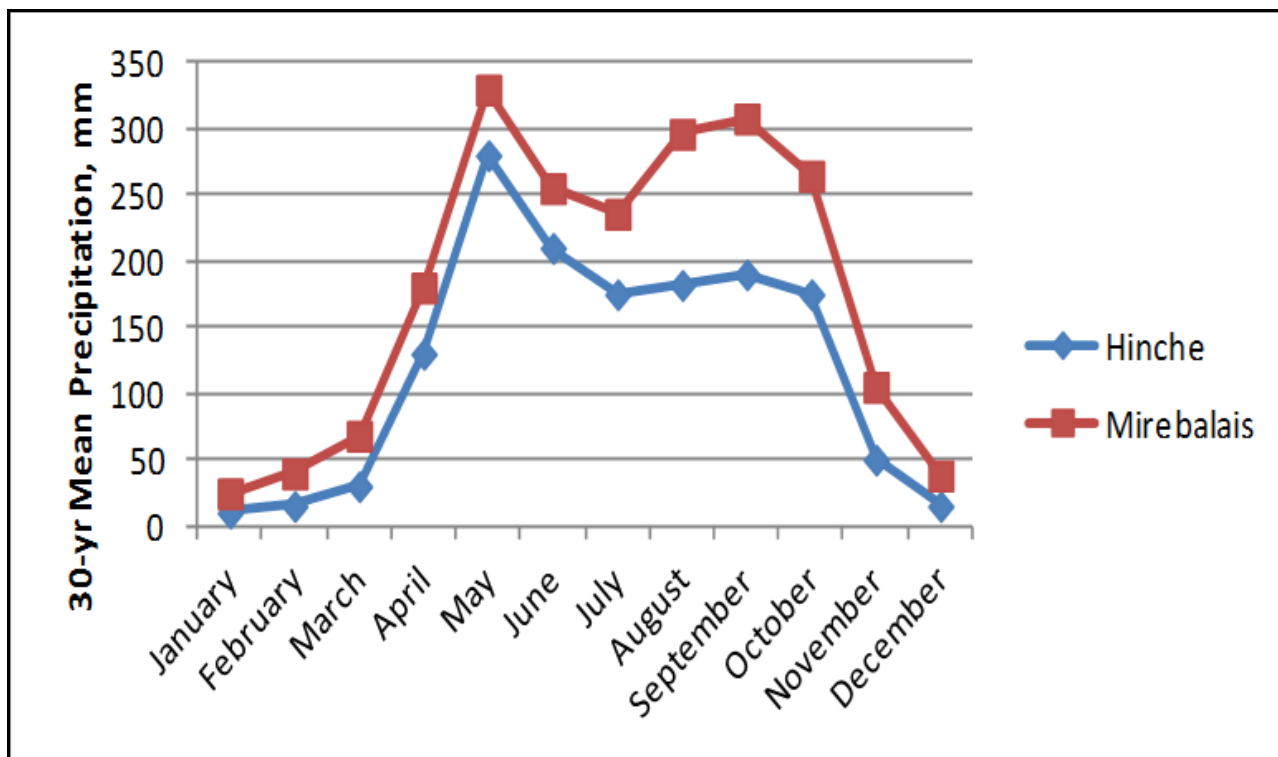
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Central Plateau

# Historical Average Rainfall



# Objectives

1. Assess the adaptability of existing agricultural production and livelihood systems for transformation into CAPS
2. Increase agricultural production through development of CAPS
3. Increase the capacity of smallholders to adapt and improve CAPS
4. Strengthen human and institutional research and extension capacity for CAPS

# Cover Crops



Sunn Hemp



Sorghum-Sudan



Sesbania



Sunn  
Hemp

Sorghum/  
Sudan

Control

# Partners

- Zanmi Agrikol—affiliate of Zanmi Lasante (Partners in Health)
- Caritas/Catholic Diocese of Hinche
- State University of Haiti, Faculty of Agriculture and Veterinary Medicine
- Ministry of Agriculture and Fisheries

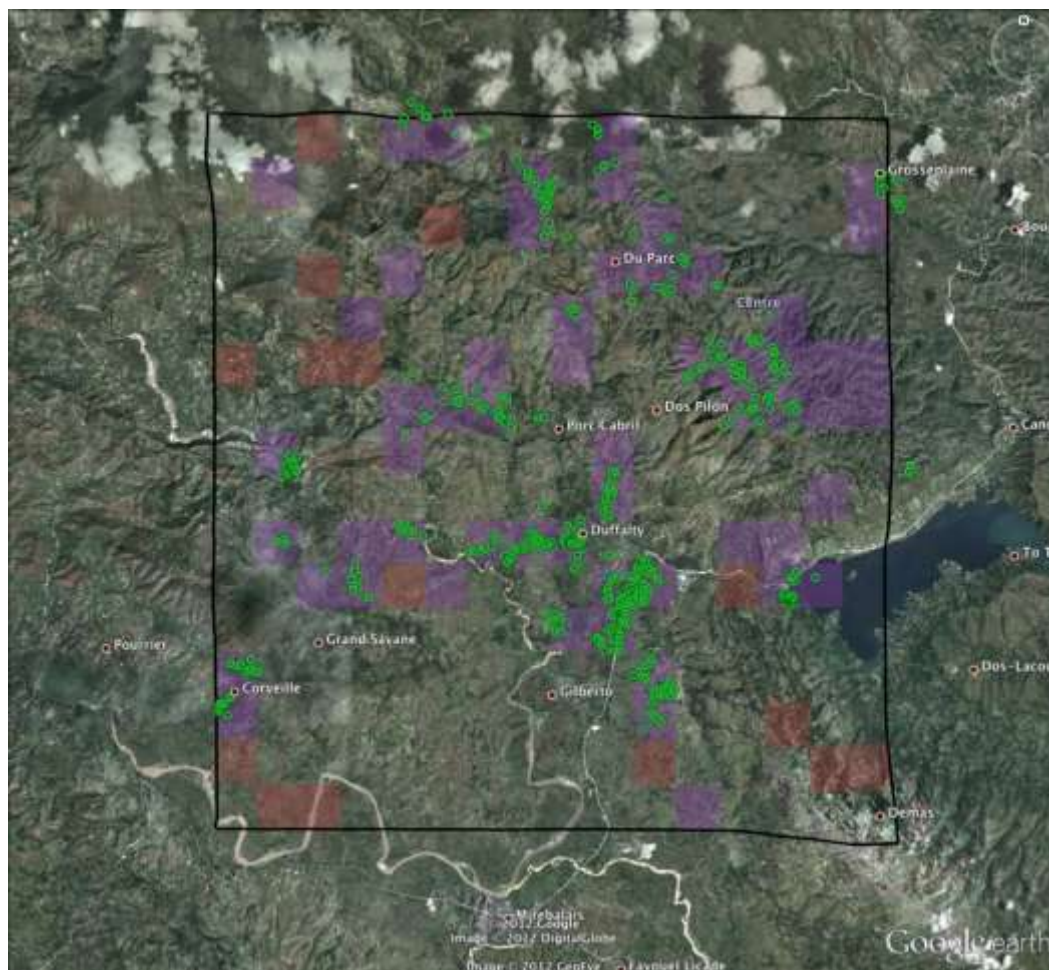
# Methods

- **Baseline Socioeconomic Survey**
  - Objective was to assess current and potential adoption of soil-conserving practices
  - Surveyed 603 households in the lower Plateau
  - Gathered information on more than 3200 individuals, 1400 agricultural plots farmed by households, 1200 fuelwood and water collection sites, and over 3300 crop plantings

# Household Survey



# Household Survey



# Methods—Agronomy

- Maize and bean variety evaluations
  - Identifying new varieties adapted for CAPS
- Replicated CAPS experiments
  - Three locations, three years
- On-farm CAPS trials
  - Initiated in 2014



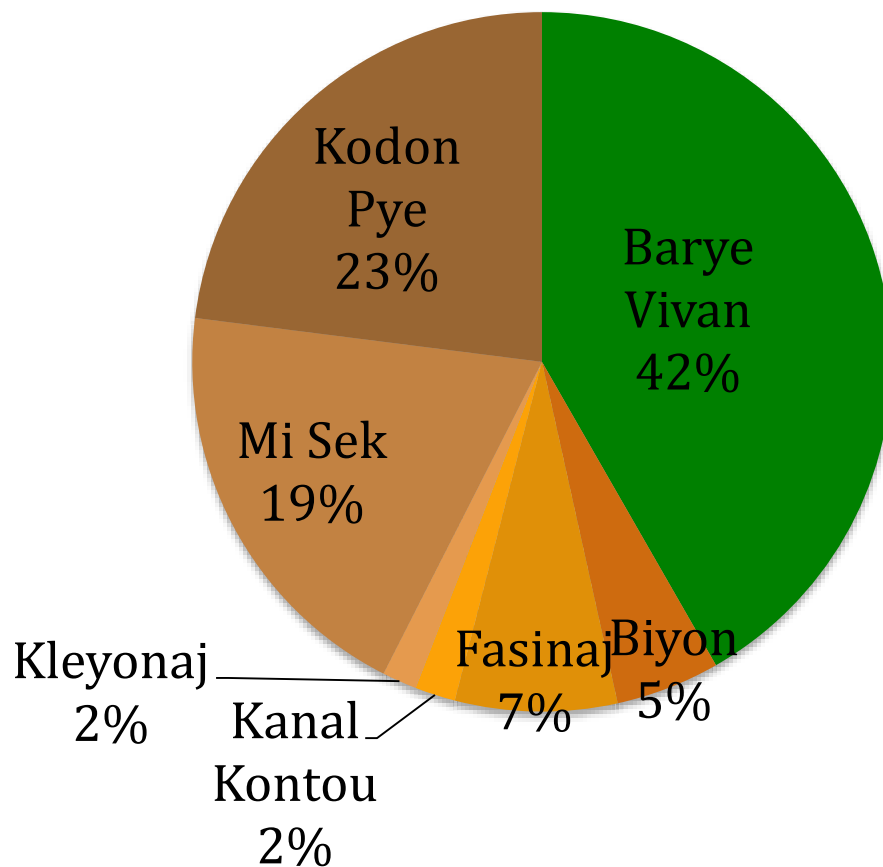


# RESULTS

# Baseline Survey Results

- Average plot = 0.6 ha and 28 minutes away on foot
- Average household farms 1.98 plots totaling 1.25 ha
- Plots are highly intercropped – most common crops are corn, sorghum, pigeon pea, manioc, banana, squash, peanut, and okra
- About 40% of plots prepared for planting with an ox-driven plow, 1% used a tractor, and remainder used hand tools
- About 40% of households had at least one soil conservation practice on one or more of their plots.

## Soil Conservation Practices



	All Observations		Use of Soil Conservation Practices		
	Average	St. Dev.	Yes	No	p value
Household Size	5.5	2.3	5.5	5.5	0.938
Number of Children (<12)	1.7	1.6	1.7	1.7	0.959
HoH Age	44.3	18.3	45.0	43.8	0.522
Area Under Cultivation (Karo)	0.98	0.76	1.11	0.88	0.003
Percent of Land Labeled "Flat"	50.9	44.7	33.0	65.0	0.000
Percent of Land Labeled "Poor"	9.7	28.9	5.0	13.4	0.003
Percent of Land With Irrigation	7.0	21.8	5.1	8.5	0.106
Diversity Index (0-1, 0 is monocrop)	0.56	0.21	0.60	0.53	0.002
Percent of Land With Title	17.7	35.9	19.2	16.5	0.453
Number of Fruit Trees Planted (5 years)	4.7	22.3	7.7	2.4	0.038
Average HHM Days Sick Per Month	0.8	1.8	0.7	0.9	0.210
Kilometers to the Nearest Market	2.74	2.15	3.18	2.38	0.000
2011 Income from Charcoal (USD)	61.28	205.13	64.81	58.47	0.759
2011 Non-Ag. Income (USD)	396.16	501.68	351.14	431.89	0.102
Value of Livestock (USD)	579.14	621.48	573.65	583.50	0.876
Value of 2011 Crop Production (USD)	353.67	489.18	385.44	328.44	0.259
<b>Number of Observations</b>	<b>386</b>	<b>386</b>	<b>171</b>	<b>215</b>	

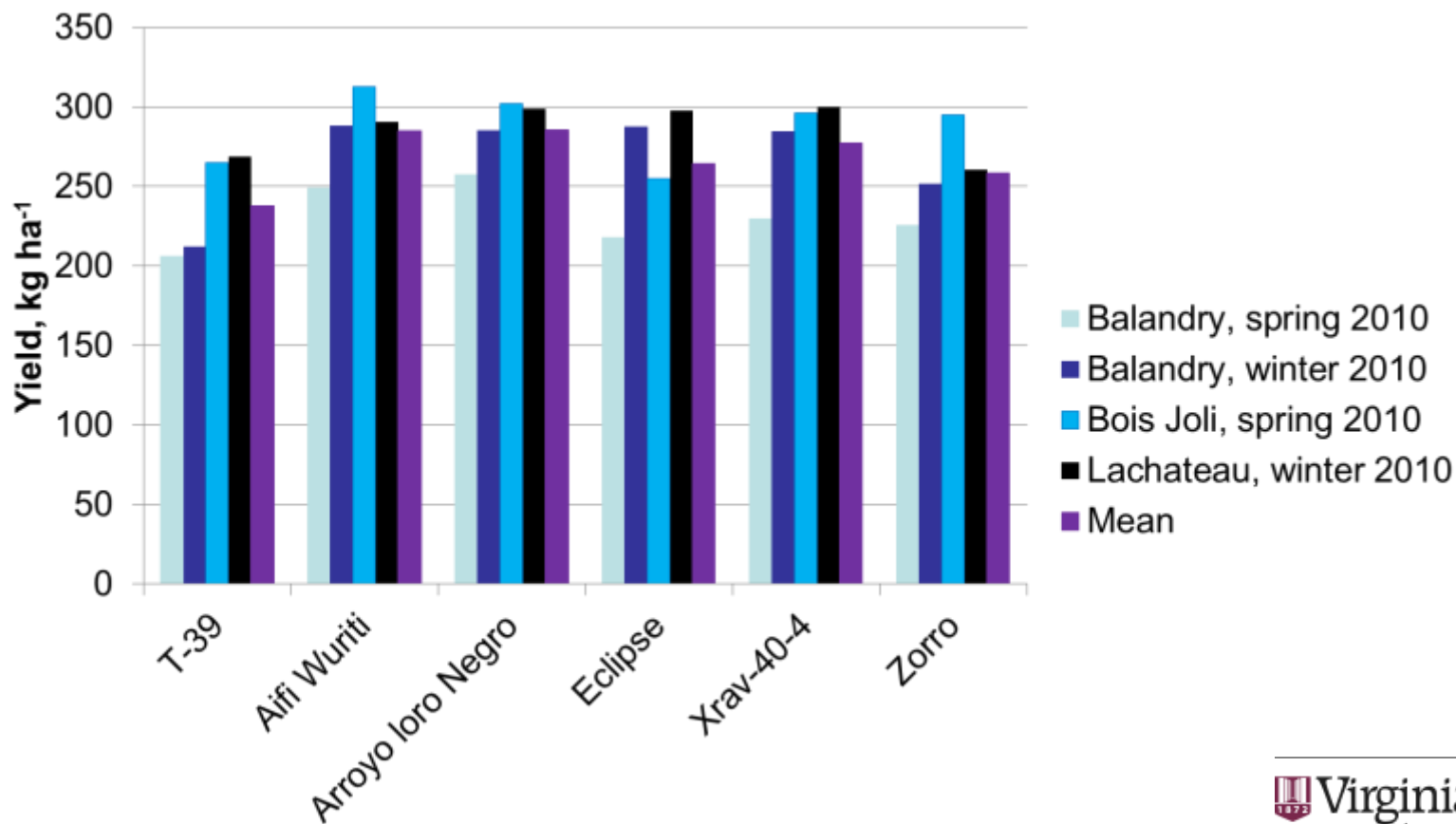
# Baseline Survey Results

- Plot specific characteristics play a dominant and significant role in both the adoption and intensity of use of conservation practices
- Households are more likely to establish “live” barriers on plots they perceive as having poorer soil, and they are more likely to establish “dead” conservation practices (e.g. rock walls or barriers) on plots they perceive as having better soil
- Land tenure status does not appear to be a significant incentive or deterrent to the adoption and use of common soil conservation practices

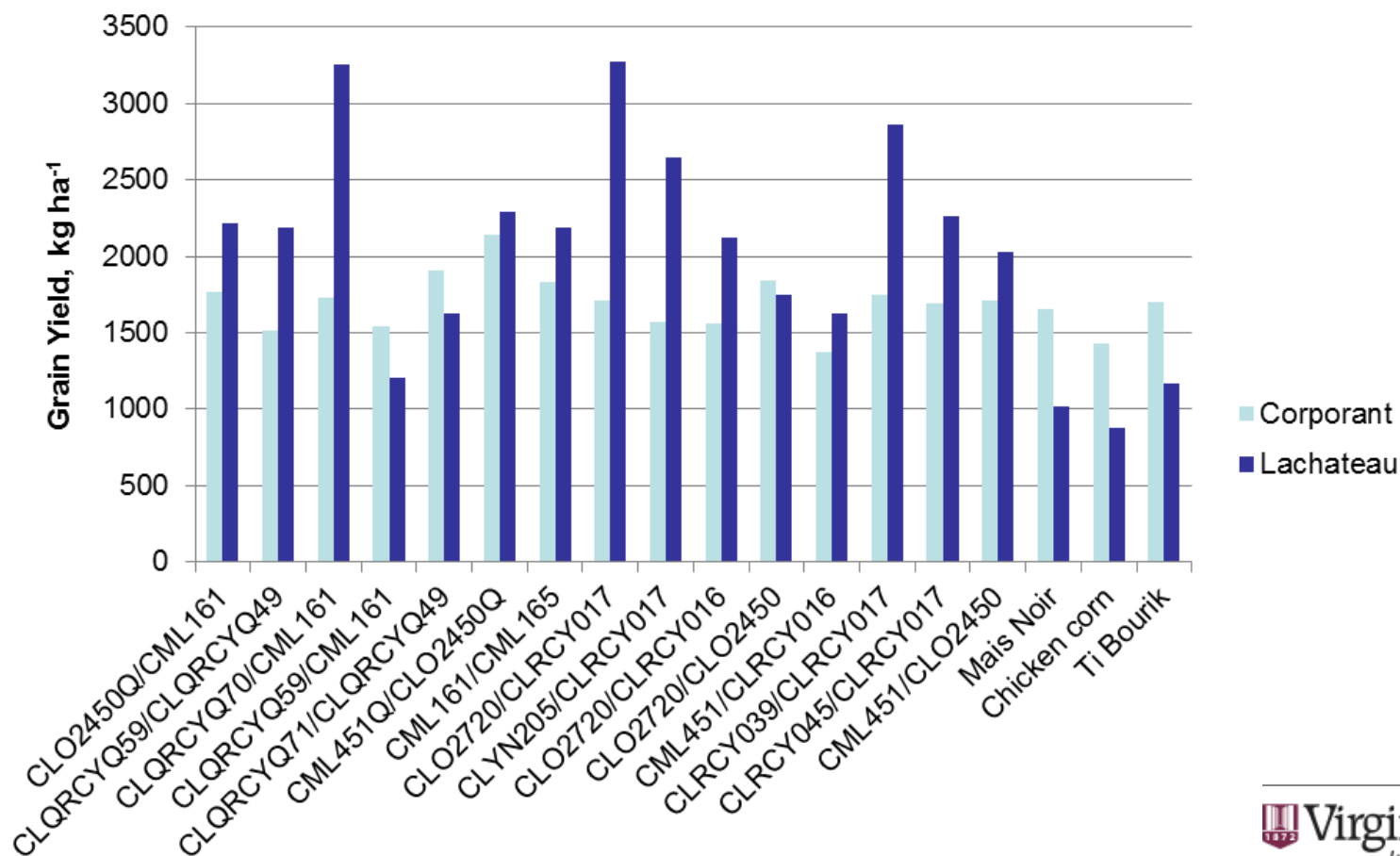
# Main Findings

- At the plot-level, land tenure, plot slope, crop diversity, soil quality, and distance from the household are found to be significant drivers in the adoption of conservation practices.
- Household characteristics such as household labor supply, number of children, head of household (HoH) age, HoH education, health status, non-agricultural income and access to markets are also found to be statistically significant drivers.
- An estimated production function shows significant and positive productivity gains for two of the three most common conservation practices in Haiti:
  - Agricultural income increases by 79% with the use of rock walls
  - Agricultural income increases by 39% with the use of hedgerows
- Econometric analysis of fuelwood management on agricultural land shows that variables related to household composition, land tenure, assets, and income affect investment and production decisions for charcoal.

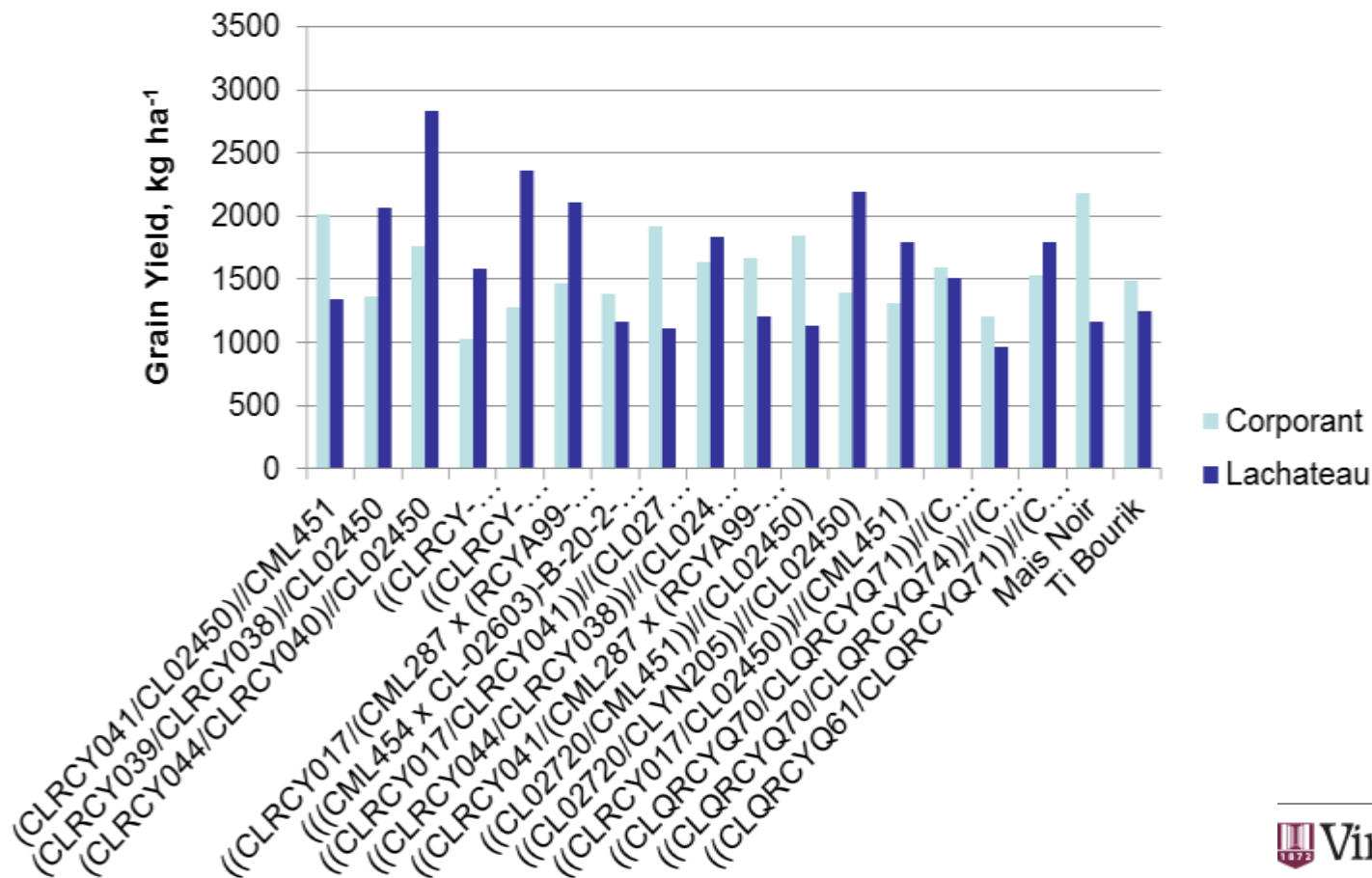
# Common bean evaluations, 2010-11



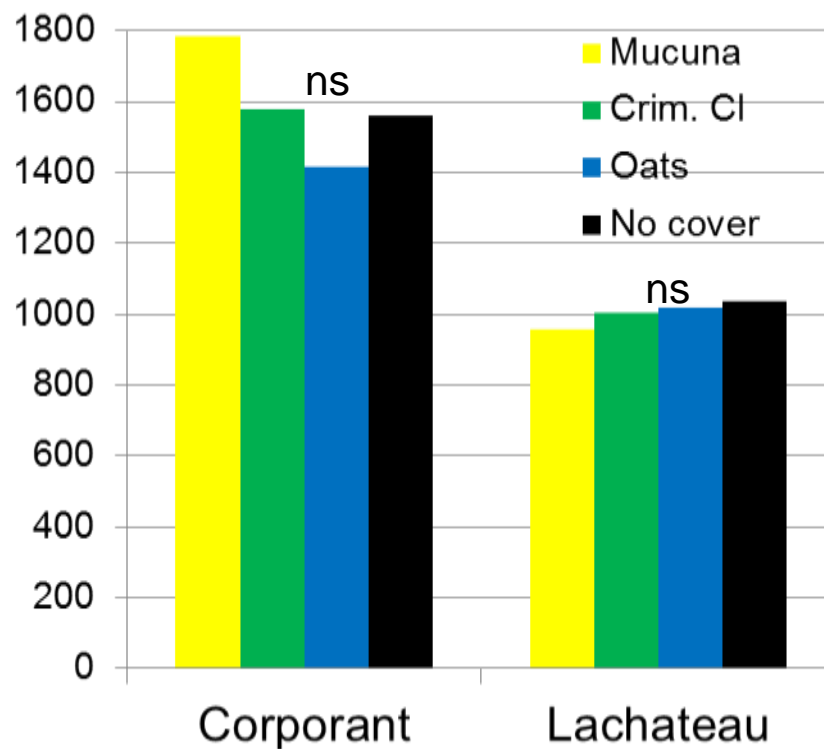
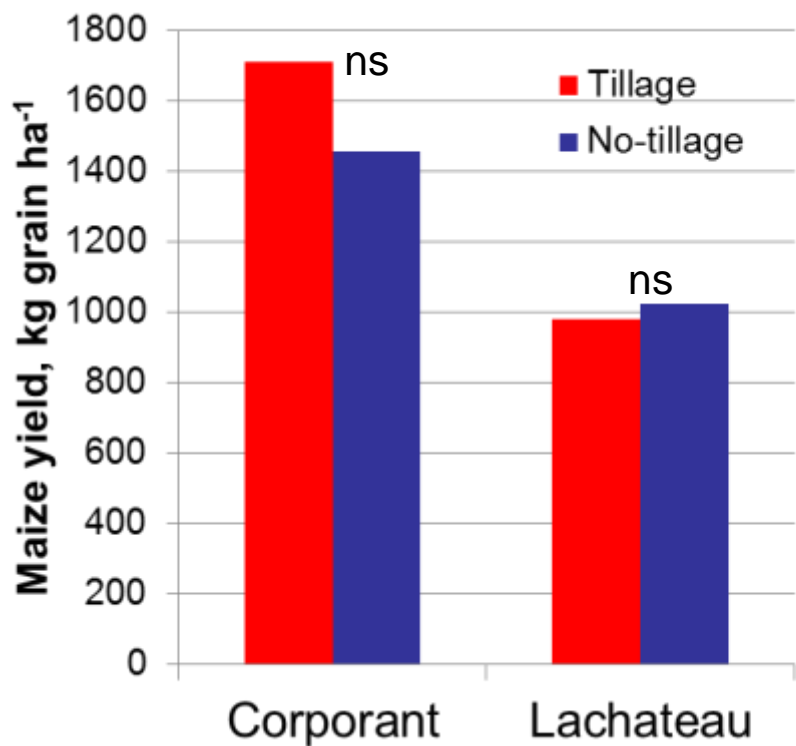
# Maize cultivar evaluations, 2011



# Maize cultivar evaluations, 2012



# CAPS Maize yield, 2012

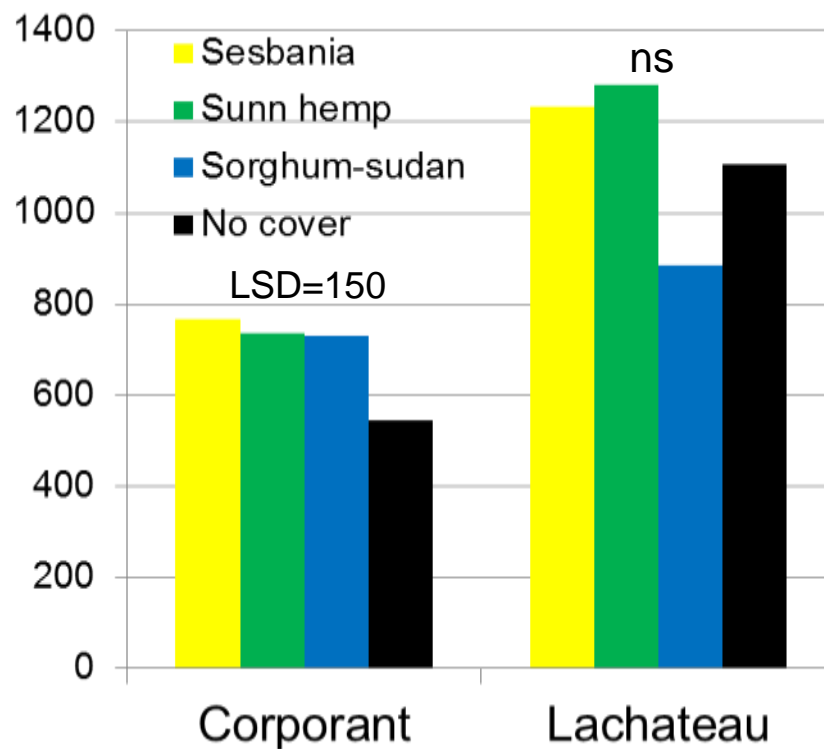
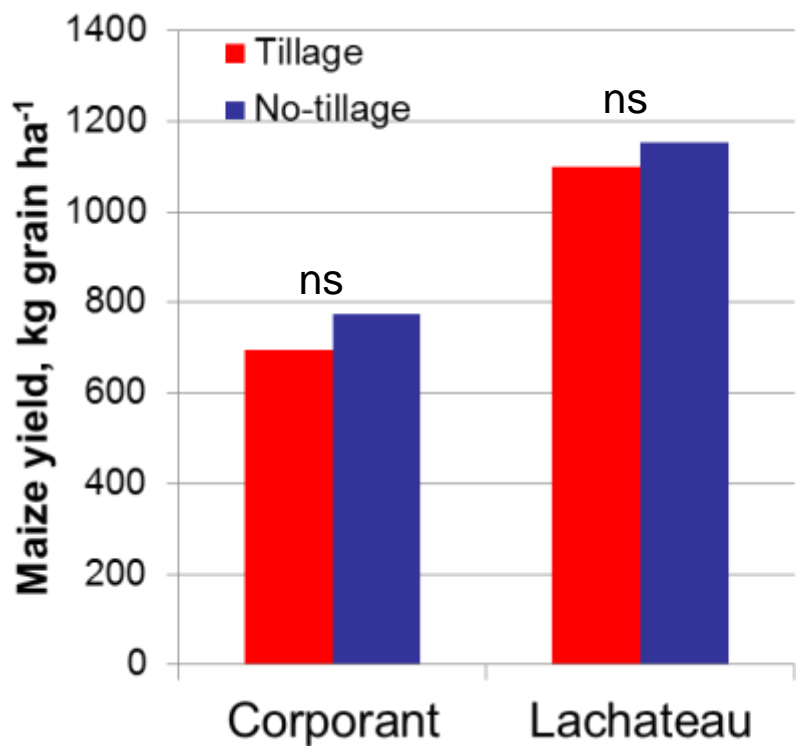




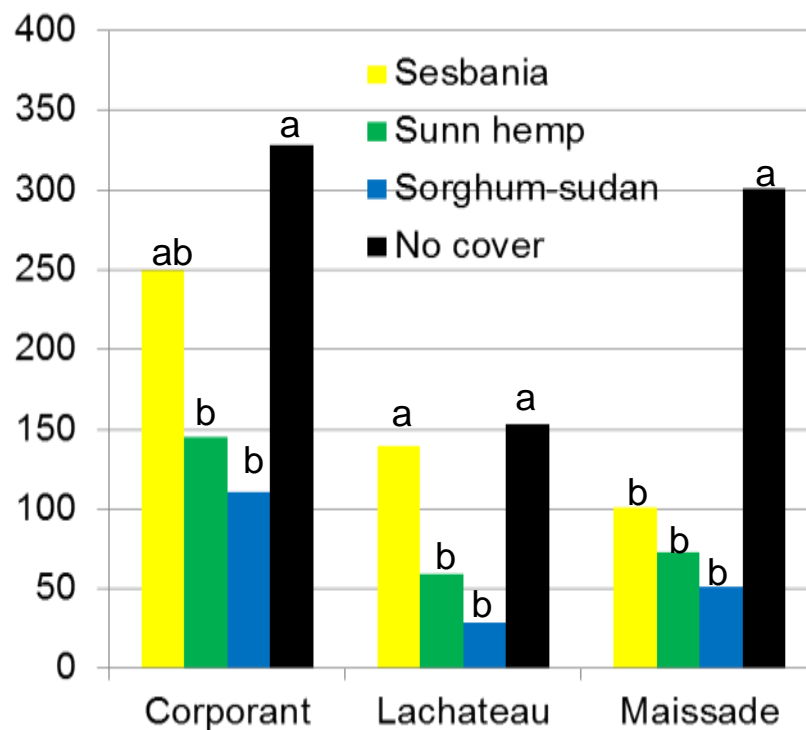
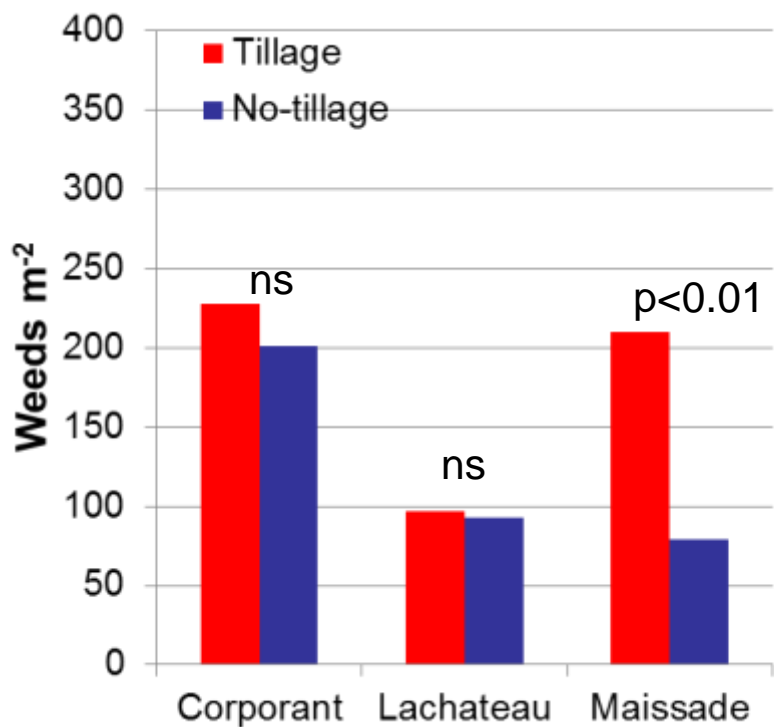
**Tilled**

**Not tilled**

# CAPS Maize yield, 2013



# Weed populations under cover crops, 2013



# Building Resilience with Capacity-building

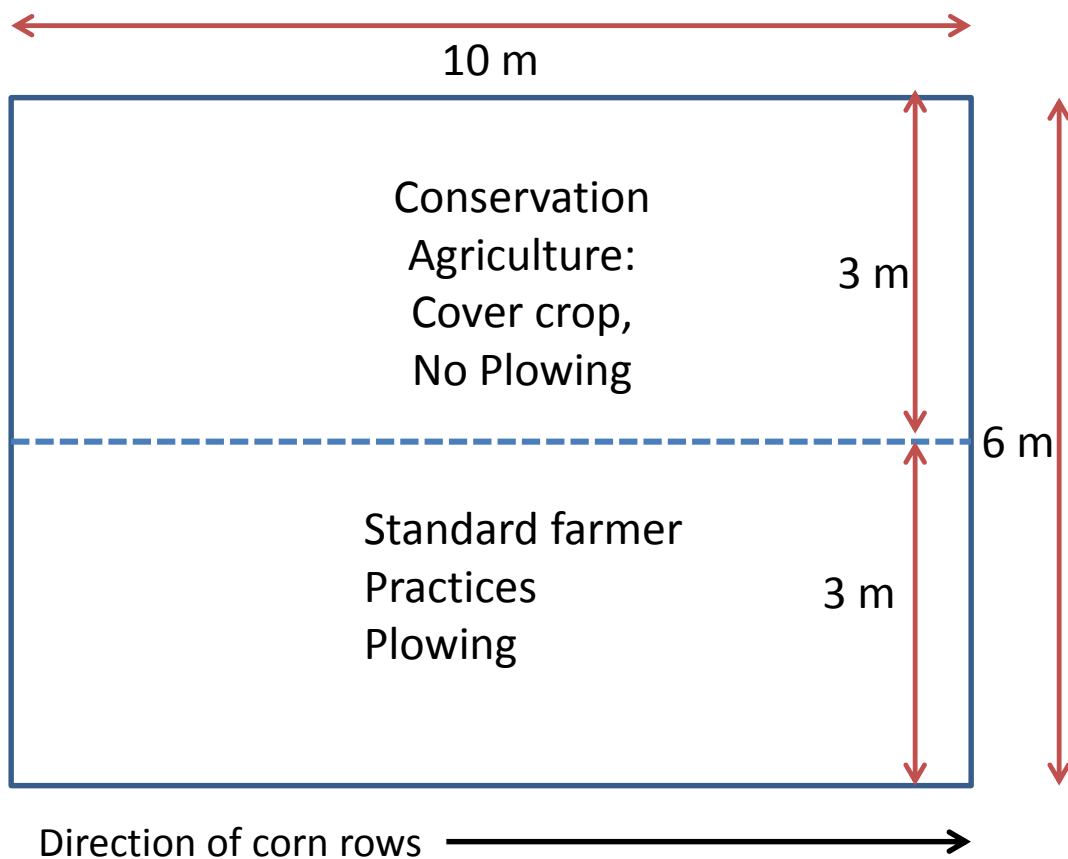


Demonstrating cover crops  
at farmer-oriented field days



Demonstrating installation  
of on-farm CAPS plots

# On-farm CAPS trials, 2014





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# Upcoming Publications

<b>Subject</b>	<b>Journal</b>	<b>Status</b>	<b>Submission Date</b>
Adoption of soil and water conservation practices in Central Haiti	Journal of Soil and Water Conservation	Draft manuscript complete	June 2014
Drivers of adoption and productivity gains from conservation practices in Central Haiti	TBD	Draft manuscript complete	July 2014
Fuelwood mgmt. on agricultural land in Haiti	TBD	In progress	Sept. 2014
Conservation cropping practices in Haiti	TBC	In progress	Sept. 2014

# Conclusions

- Our “baseline” survey shows that existing soil conservation practices are positively correlated to crop yields
- After two years of CAPS experiments:
  - Crop yields have not decreased with reduced tillage
  - Crop yields have increased or not decreased with cover crops
  - Weed populations are lower with CAPS
- So far, our results suggest that CAPS can improve crop production