

# Estimating land area under OSP in Uganda



**HarvestPlus**  
Better Crops • Better Nutrition

Richard Alioma  
Innocent Bikara  
Ignatius Abaijuka  
Manfred Zeller

---

HarvestPlus c/o IFPRI  
2033 K Street, NW • Washington, DC 20006-1002 USA  
Tel: 202-862-5600 • Fax: 202-467-4439  
HarvestPlus@cgiar.org • [www.HarvestPlus.org](http://www.HarvestPlus.org)





# Methods used to estimate land area under OSP in Uganda

Use of Forecasting / simulation models to estimate Households reached and area under OSP in Uganda

Use of GPS to estimate land under OSP by Vine multipliers

Annual monitoring min surveys



## Simulation / forecasting models

- Used to track the progress of bio fortification program implementation in Uganda
- To project the expansion path of the program
- To estimate and project important outputs, outcomes and impacts



# **Model Inputs, Assumptions and Data Sources**



# Parameters

Parameter	Value	Source
Number of households reached directly by partners	Periodic	Partners/MLA SP
Number of vines/sacks of vines given to each beneficiary	500 vines, 15kg, ½ a sack	CP team, program design
Number of PB beneficiaries per beneficiary farmer	2	CP team, program design
Proportion of farmers who actually payback the vines	81%	Uganda country team
The proportion of recipients who drop out after planting the previous season	6.5 %	REU
Proportion of beneficiary farmers who actually diffuse vines informally	81%	DDBC Mid-term
Number of farmers reached by each beneficiary farmer through informal farmer-to-farmer diffusion	2.32	DDBC Mid-term



# Parameters

Parameter		Value	Source
Average number of vines given to other farmers by beneficiary farmers as part of the HP PB		500	CP, program design
Average number of vines diffused to other farmers through farmer-to-farmer diffusion		1000	Guestimate, CP MLA
Planting rate of SP vines (vines/ acre)		11,000	CP
Yield of OSP (tonnes per acre)	1 <sup>st</sup> planting cycle	3.85	CIP*
	2 <sup>nd</sup> planting cycle	2.22	CIP*
	3 <sup>rd</sup> /farmer field	1.44	CIP*

\*quoted conservatively from CIP presentation at last review workshop



# Parameters

Parameter	Value	Source
Percentage of $\beta$ -Carotene lost during preparation/processing	22.5%	Bengtsson <i>et al.</i> (2008)
Conversion ratio of $\beta$ -Carotene to Retinol Activity Equivalent (RAE)	12:1	Holtz <i>et al.</i> (2012)
EAR of vitamin A ( $\mu\text{g}/\text{d}$ ) for children 12-59 months, lactating & pregnant women in Ug	236, 547, 897	Computed from UNHS, IOM data
Total population, Uganda	35,371,015	UBOS, UNHS 2012
Number of households in Uganda	7,008,361	UBOS, UNHS 2012
Total Number of sweet potato farming households in Uganda	3,682,045	UBOS, UNHS 2012 ( <i>inferred</i> )
Total area under sweet potato cultivation in Uganda (acres)	1,087,858	MAAIF & UBOS (UCA 2008/9)
Average household sweet potato area in Uganda (acres)	0.3458	Computed



# Assumptions

---

- Households, on average, increase area under OSP by 37.5% for the 1<sup>st</sup> 2 seasons of cultivation, and maintain it constant thereafter, till they drop out.
- Household substitute OSP for non-OSP but do not expand total SP area.

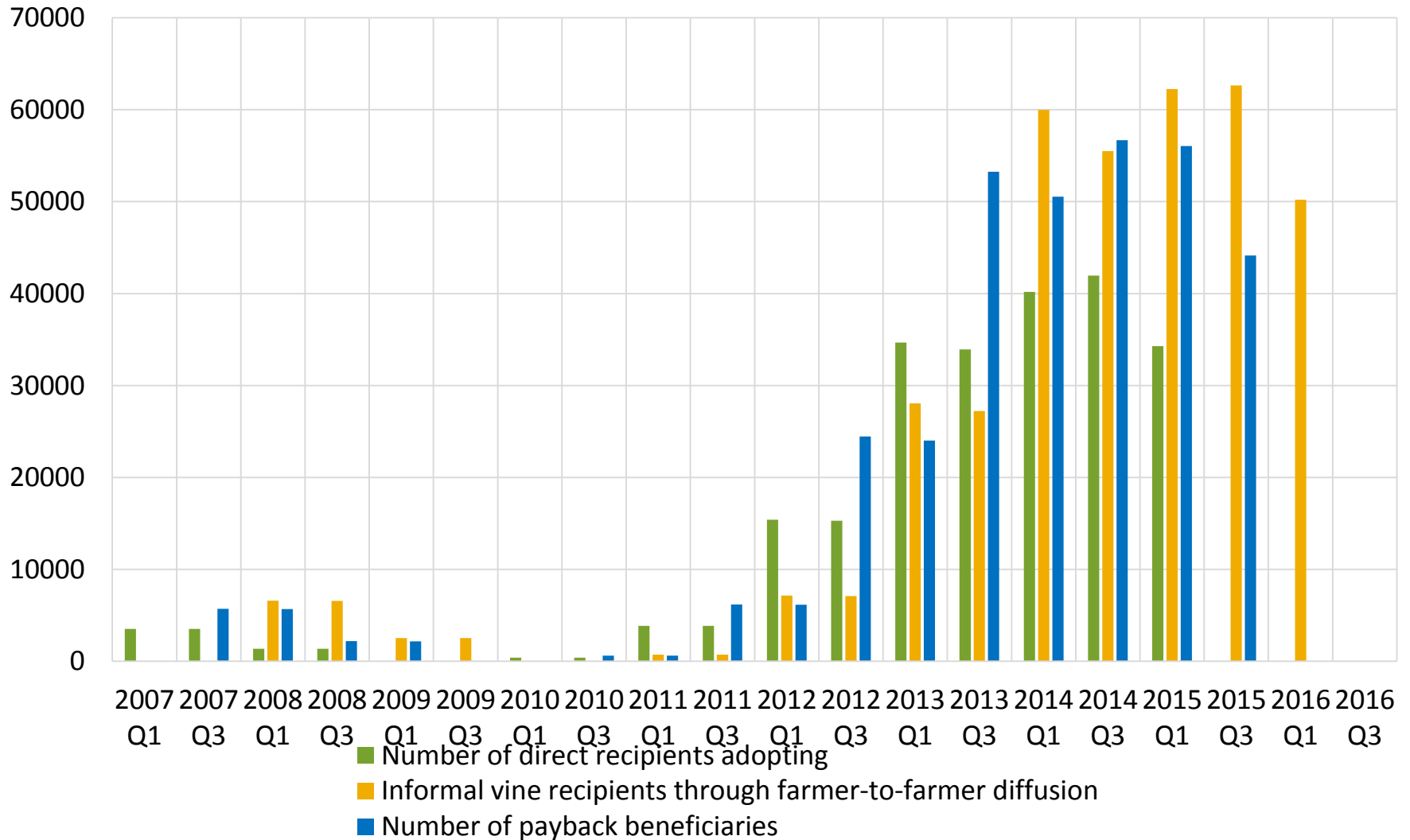




# Sample of Model Results

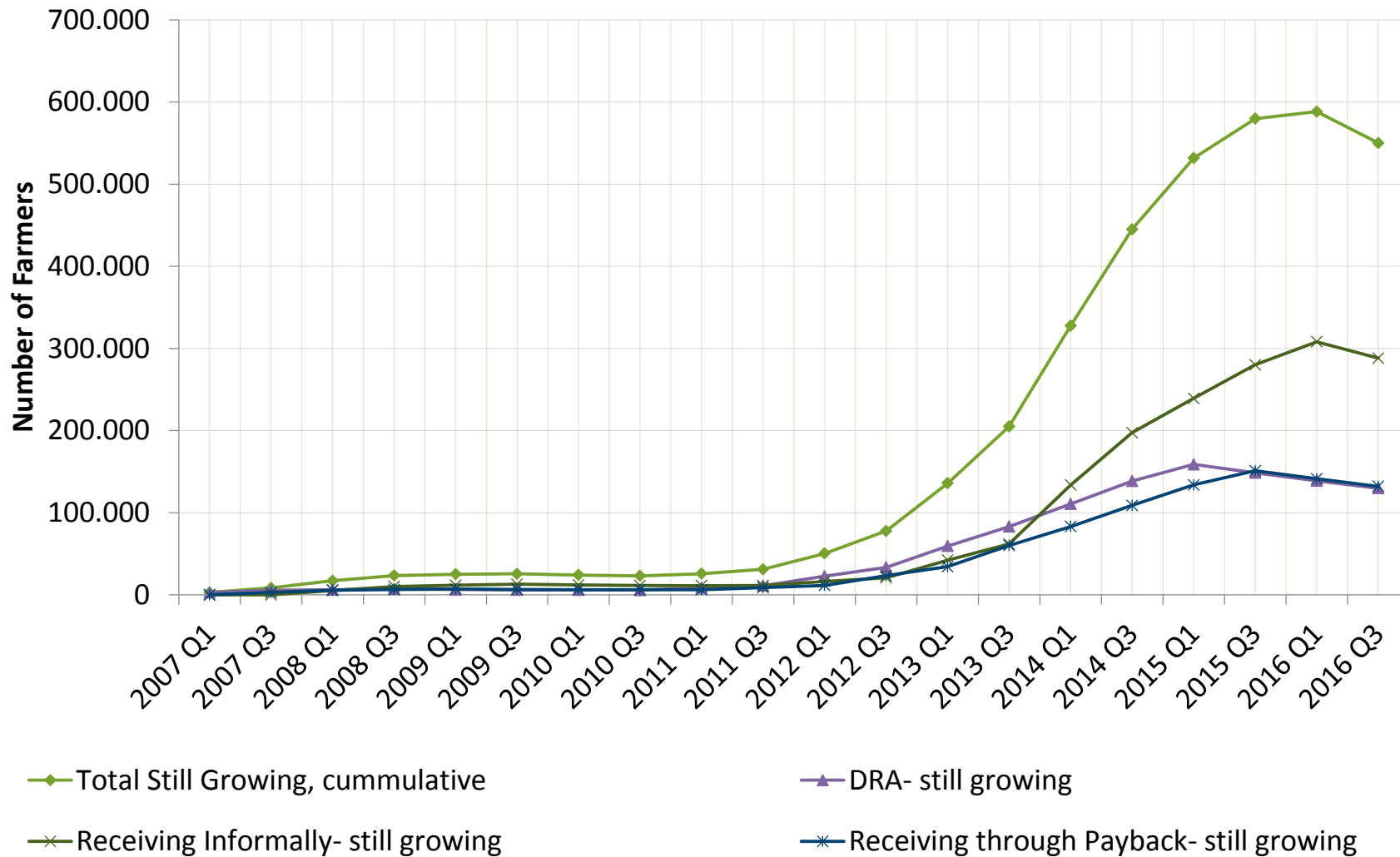


# Farmers Reached with OSP in Uganda by 2015



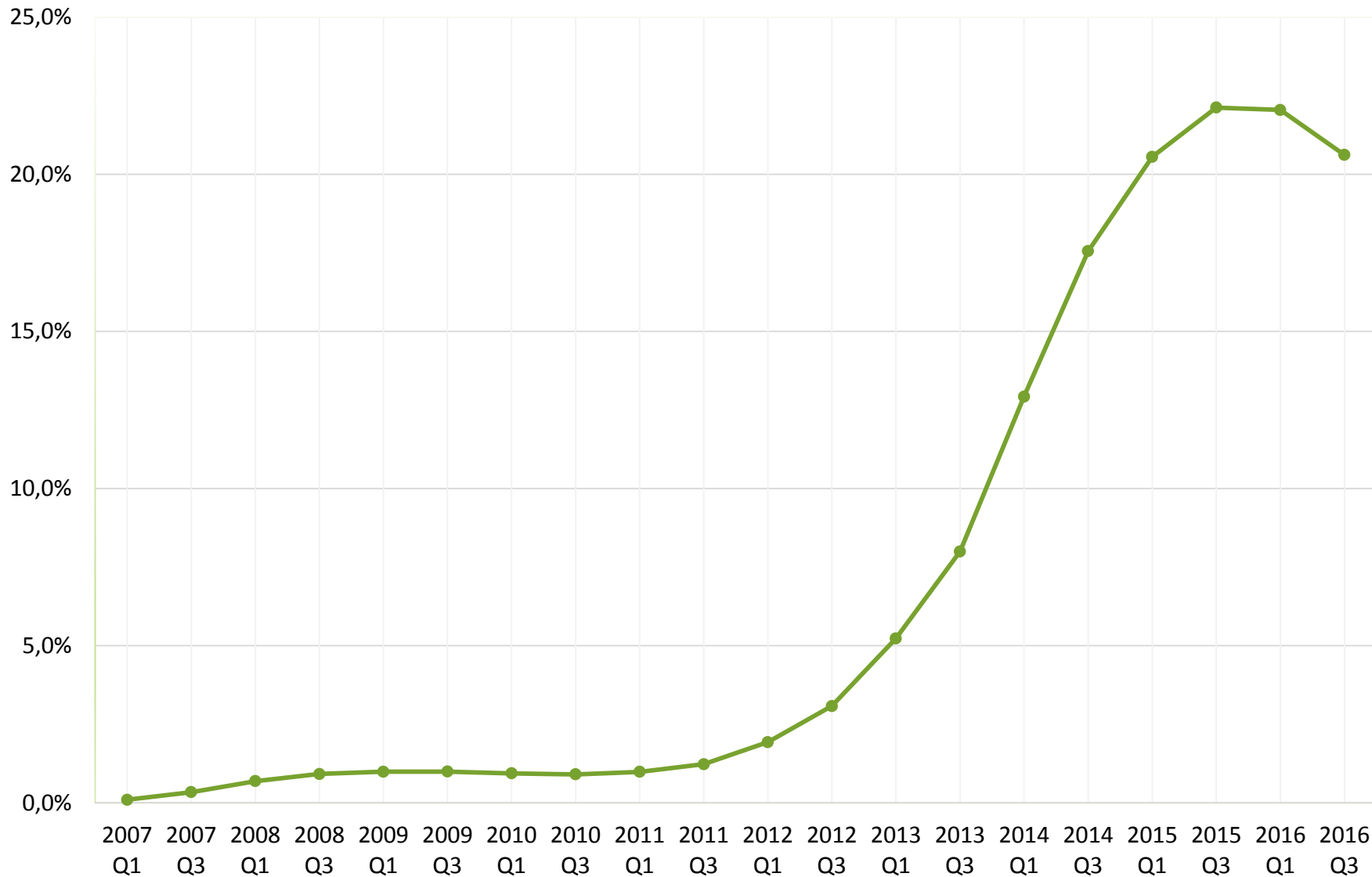


# Cumulative number of farmers growing Orange sweet potatoes in Uganda by 2015



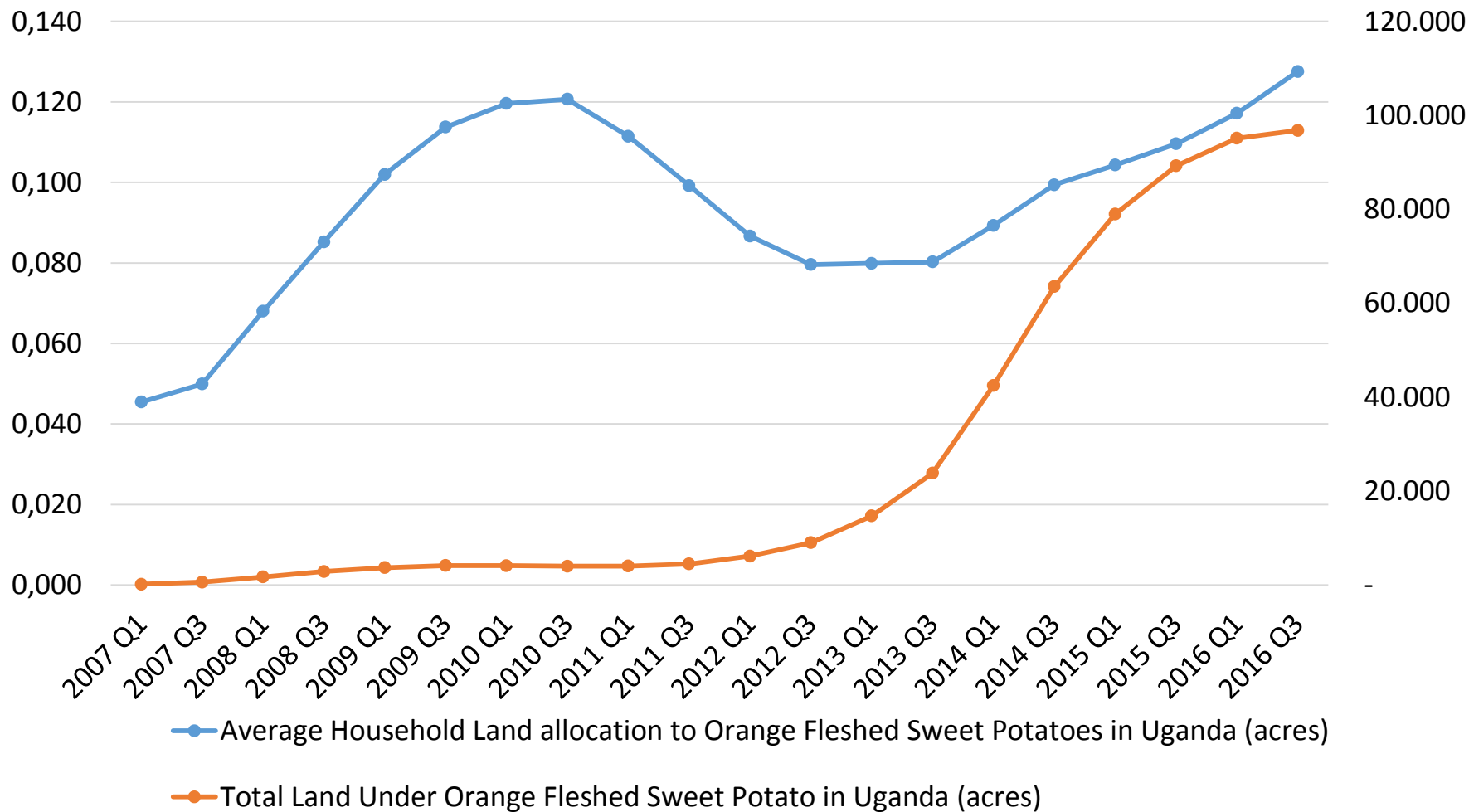


# Percentage of farmers in Uganda growing OSP by the end of 2014



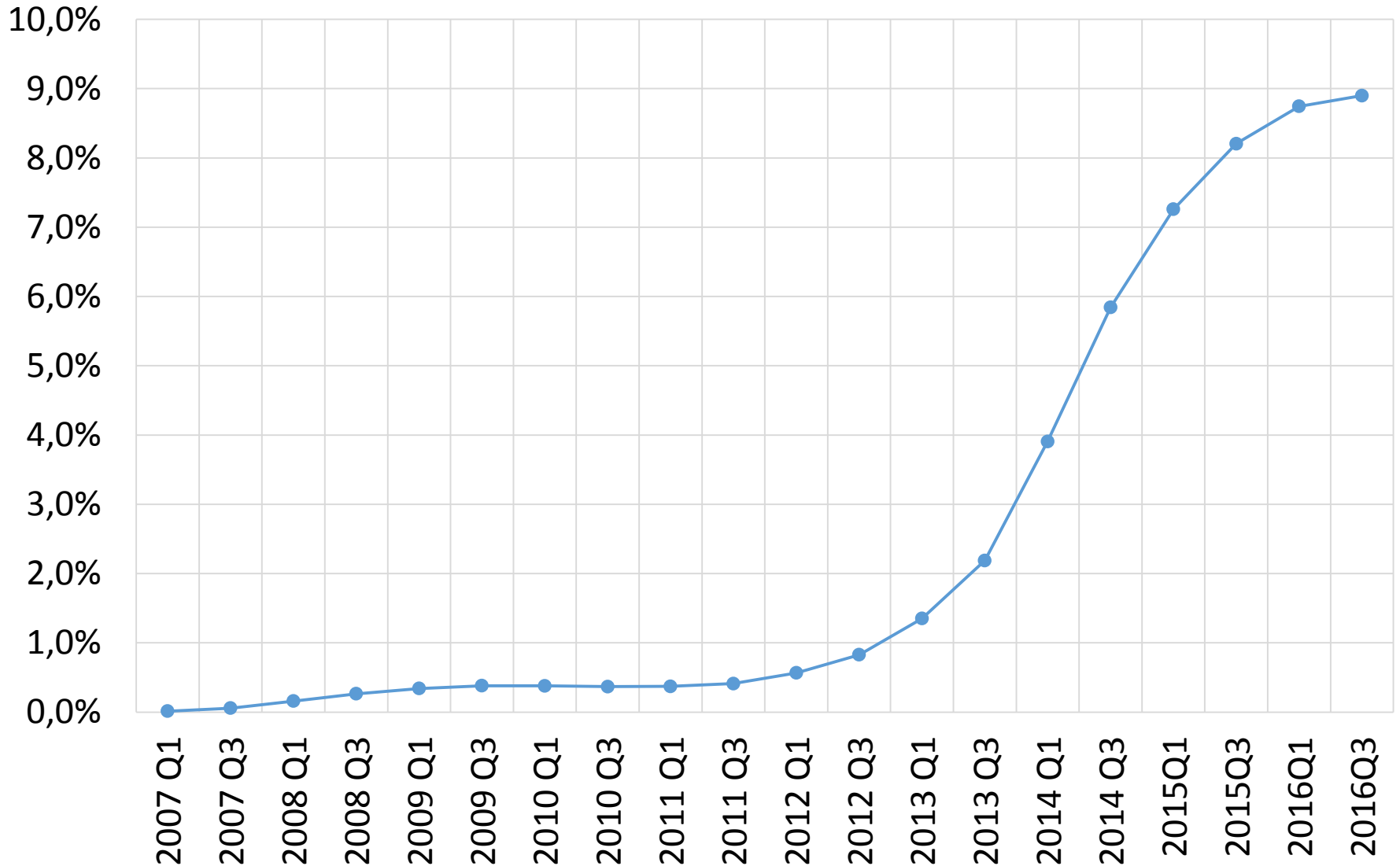


# Average Household land allocation and Total land under OSP in Uganda





# Percentage of sweet potatoes area under OSP by 2014.





## Critical Variables With High Uncertainty

---

- On-farm yield
- Farmers' multiplication/retention of vines
- Whether farmers are expanding their OSP area over time
- Number of vines shared from farmer to farmer



# Conclusion

---

- The data collected by HP+ IPs has wide ranging implications on:-
  - Organizational reporting to donors & other stakeholders;
  - Policy decisions/trajectory.
- It is therefore important that IPs take issues of data accuracy and integrity seriously.





# land Area Under OSP Multiplication in Uganda

---

- HarvestPlus contracts 34 secondary multipliers every season to supply OSP vines
- The practice is that each secondary multiplier works with other tertiary multipliers and the number of tertiary multipliers vary
- Tertiary multipliers supply thru the secondary multiplier who is contracted by H+



# land Area Under OSP multiplication in Uganda

---

- Each multiplier has at least 5 varieties on different blocks
- Data collectors move with simple questionnaire that guides data collection
- In each season data is collected three – four months before distribution starts.
- Starting date varies from region to region



# land Area Under OSP multiplication in Uganda

---

Data collectors begin asking the vine multiplier to estimate area under each variety using expert judgment

Enumerators thereafter visit gardens and measure acreage using GPs.

Enumerators thereafter add acreage of different Blocks for the same variety



# Challenges

---

Variations between multipliers estimates and actual estimates

Mixing of varieties in the same block

Lack of labels for Varieties

Small and scattered plots for multipliers that takes time to visit

Change of location of multiplication sites from



## Way Forward

---

Providing enough time to enumerators to measure all multiplication blocks by vine multipliers

Encouraging vine multipliers to separate different varieties and providing labels for each variety

Plan to conduct annual monitoring min surveys to estimate yield and acreage under OSP varieties.



**Thank you!!**