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ACIAR Cassava Livelihoods and Value Chain Program Mid-term Review

CIAT 50
1967-2017

Cassava demonstration with plantation companies & CMD monitoring within variety trial

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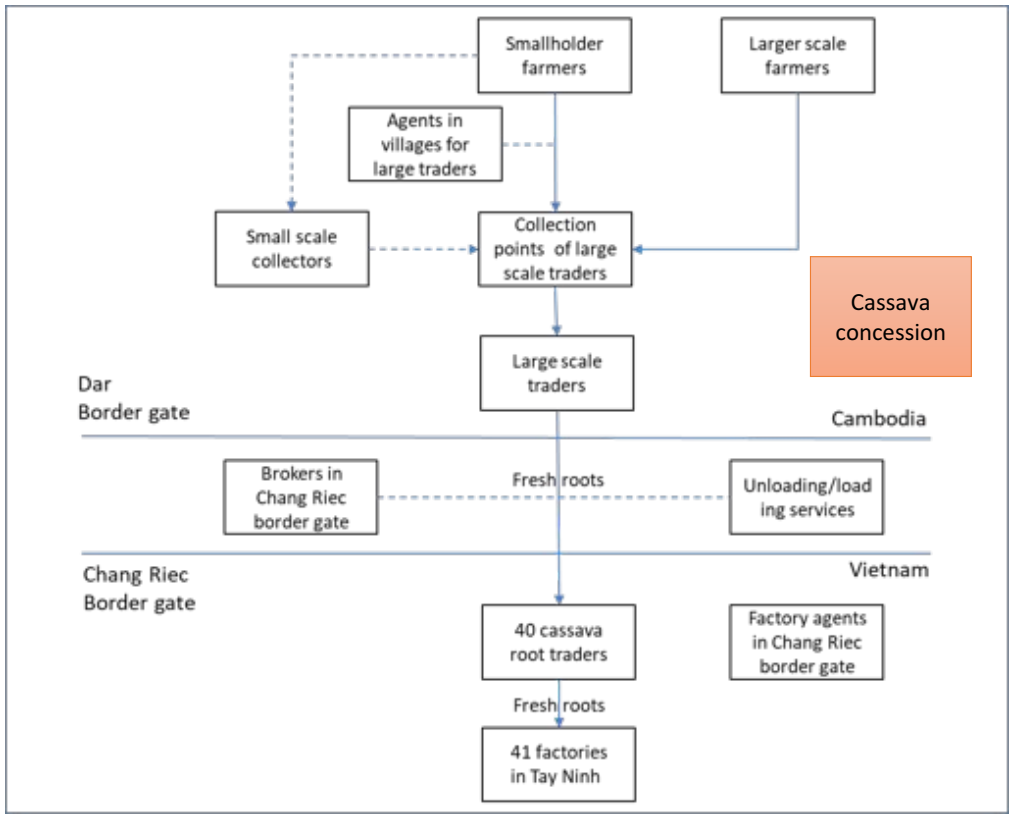
Introduction



We have already discussed working with large traders and processors….

Can you work with large cassava producers for the benefit of smallholders:

- For conducting research trials that benefit smallholders
- To develop demonstration and learning sites for surrounding farmers
- Producing clean planting material

Methodology

- A company interested in agronomy trials for their own land – but had a CSR program and engaged a local NGO to develop their plan

- There were 3 types of experiences- Cassava varietal, NPK Fertilizer, and Long-season evaluation trials
- The 3 trials were planted at DT Saigon company's farm in Kratie province in June, 2016
- NPK fertilizer was applied to cassava variety and long-season evaluation trials at the rate 80:20:80
- Cassava variety and fertilizer trials were harvested at 9 months after planting
- Cassava root yields and root starch content were calculated and analyzed

Varietal Trial

Treatment
SC9
Hauy Bong 60
KU50
KM 98-1
Rayong 1
SC8
Company 1(from VN)

Fertilizer Trial

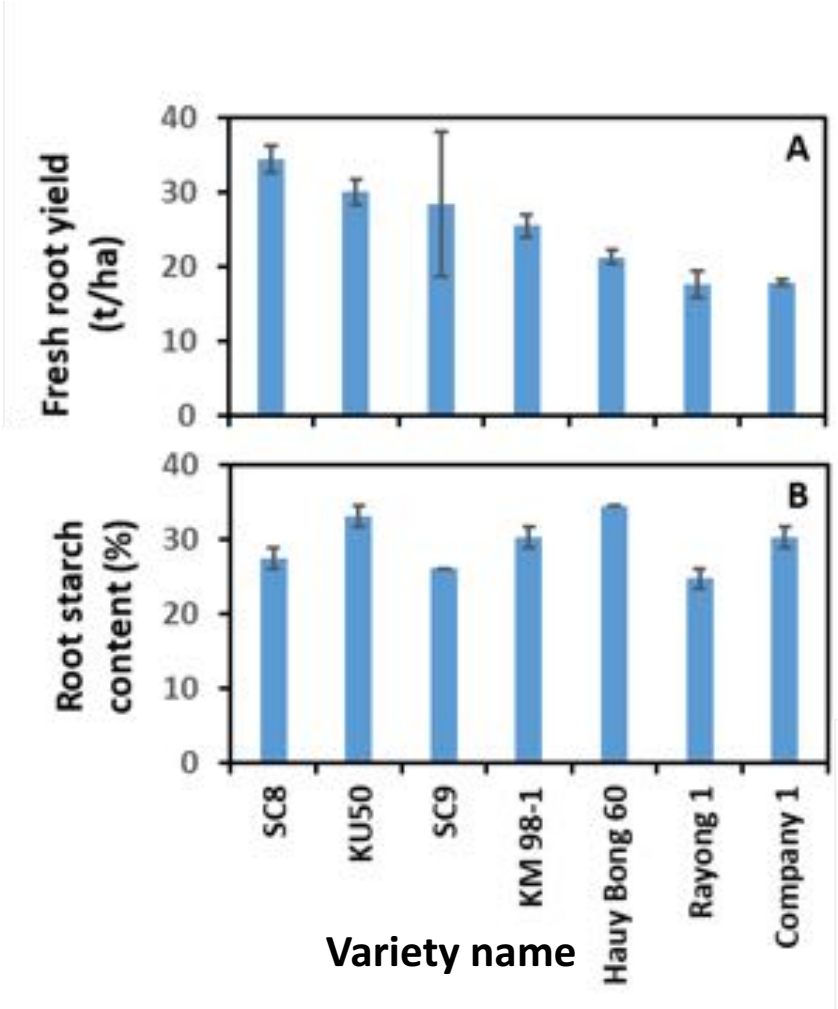
Treatment
0:00:00
24:12:66
40:40:80
80:40:80
160:40:80
80:0:80
80:20:80
80:80:80
80:40:00
80:40:40
80:40:160
160:80:160

Long-season evaluation

Treatment
A = 8 months after planting
B=11 months after planting
C=14 months after planting
D= 17 months after planting

Result: Cassava variety Trial

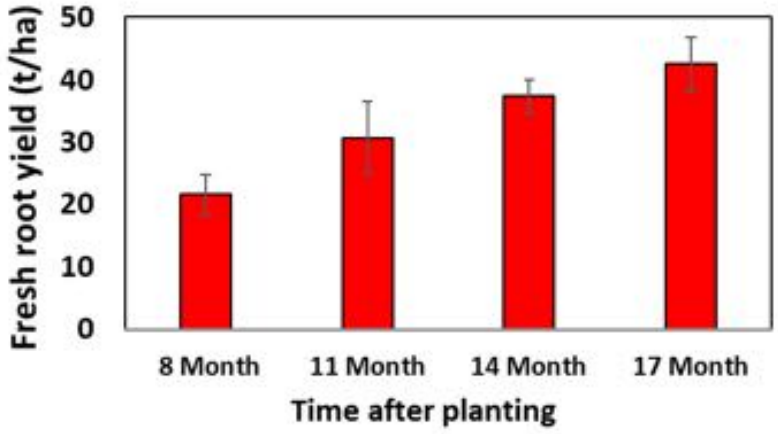
Root yield significantly varied among tested verities

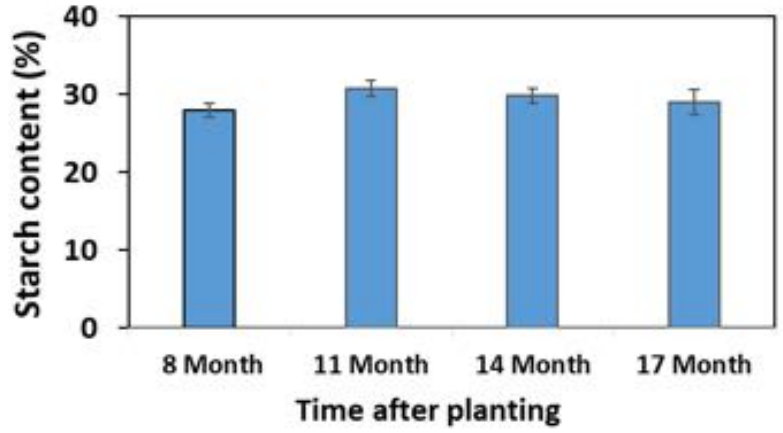


Several varieties perform better than the existing variety use

Result: Cassava long-season evaluation Trial

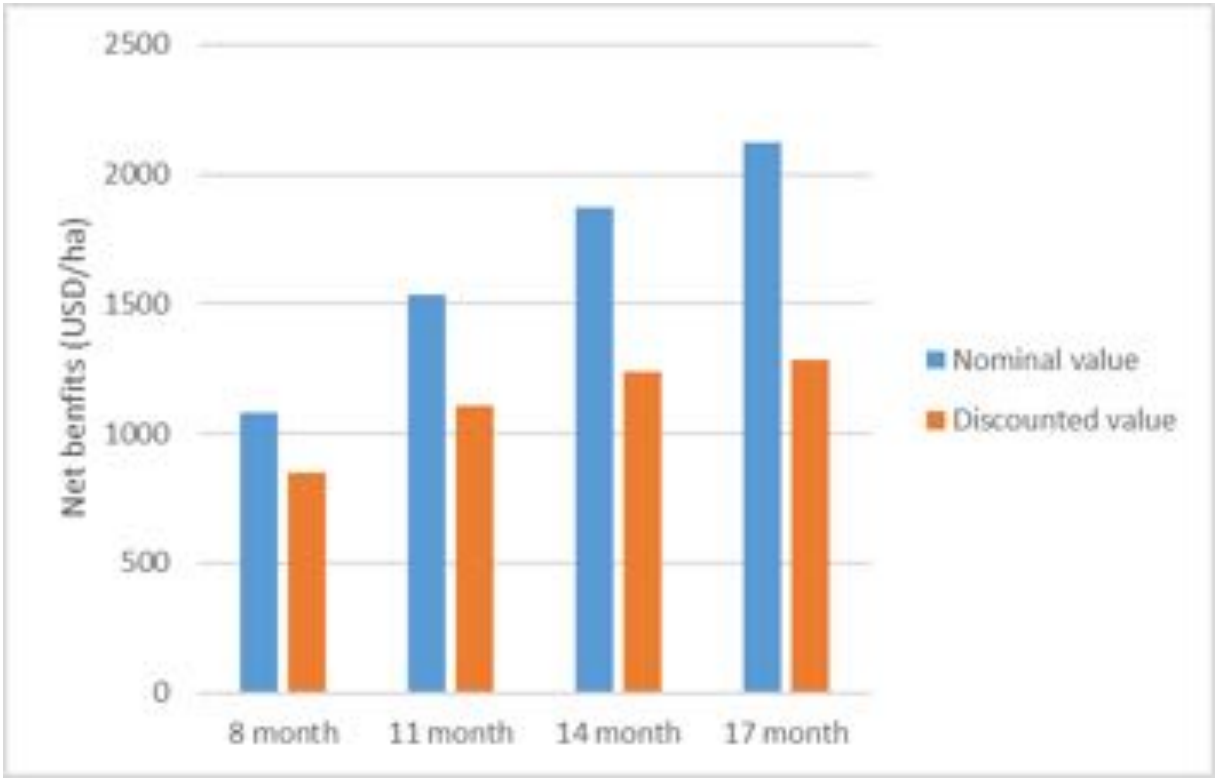
Root yield significantly increased by delayed harvest





Implications for smallholders

50 USD/t and 3% /month interest



Farmers rush to harvest – avoid unknown prices, pay off debt

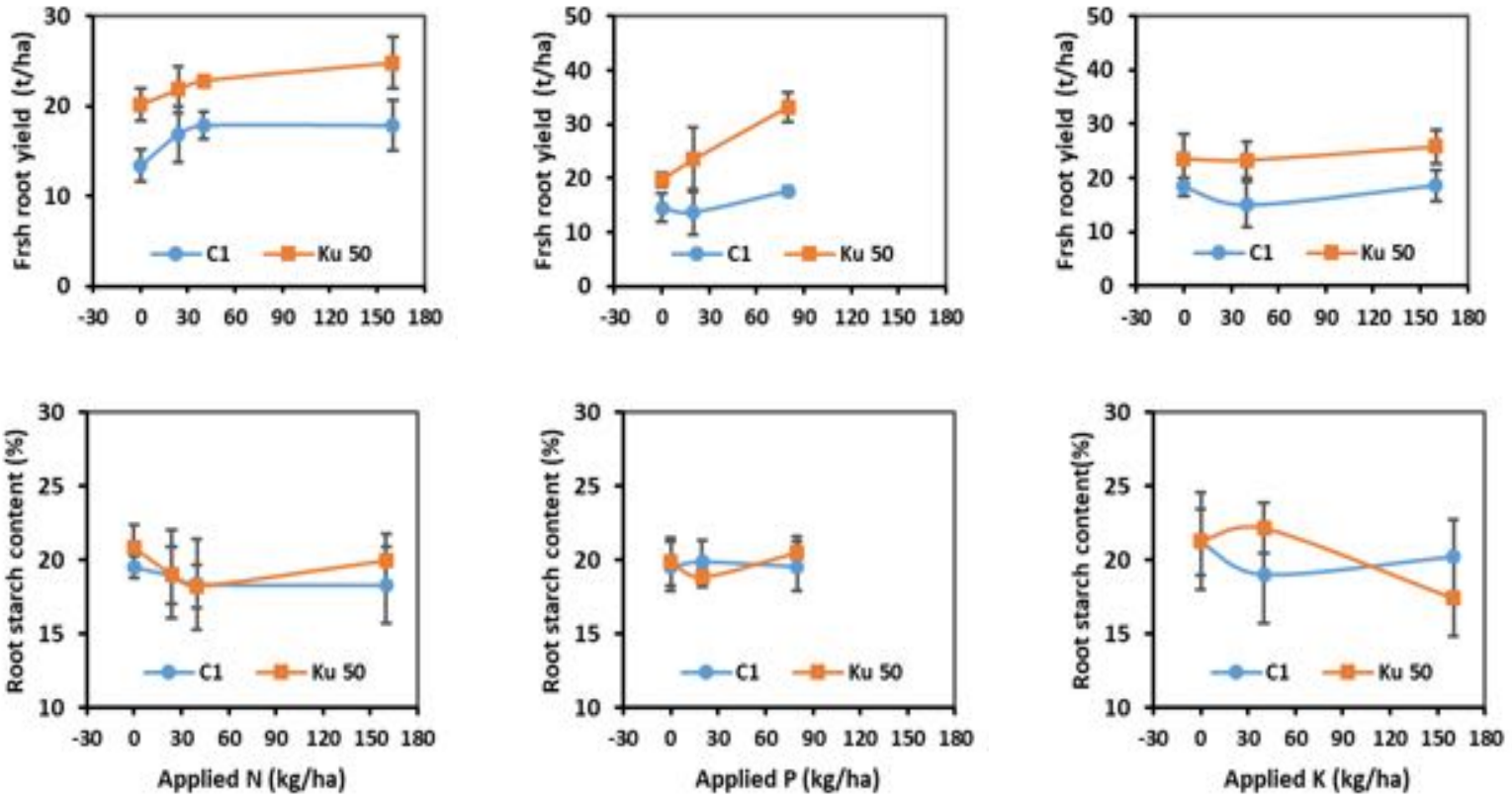
Can cash from intercropping help alleviate debt to allow farmers to wait?

Would short term financing for immediate cash needs help?

These are scenarios to explore with agronomic data with economic analysis together with farmers and other support actors in the value chain.

Result: Cassava Fertilizer Trial

Root yield significantly increased with fertilizer application



N:P:K

0:0:0, 24:12:66
40:40:80, 160:40:80

80:0:80, 80:20:80
80:80:80

80:40:00, 80:40:40
80:40:160

Our vision, a sustainable food future

CMD Monitoring within demonstration trial: A terrible opportunity

- Trials were planted in Kratie province mid of May 2017
- There are 7 varieties with 3 replication
- During routine field visit it was noticed that the trial was infected by CMD
- 1st visual assessment was conducted at 2,5 months
- Samples sent to CIAT HQ for assessment
- 2nd survey was conducted at 6 months after planting
- Using tablet with CommCare program


Fertiliser trial 2
Variety trial 1
farmer field
Variety trial 2

Trial 1&2

Variety: 7

- Hauy Bong 60
- KU50
- Rayong 72
- KM98-1
- SC8
- SC9
- Local(farmer’s variety reserved from 2016)

DNA Fingerprinting has just revealed that the farmer variety is KM419


ពូជក្នុងស្រុក


R1
Rayong 72


R3
Huay Bong 60


R2
KM98-1

What's difference between CMD symptom and symptom caused by weedicide?>>>

Location 2

	V	rayong_72				
	P1	P2	P3	P4	P5	P6
R1	1	1	0	0	0	0
R2	0	0	0	0	1	0
R3	0	0	0	0	0	0
R4	0	0	0	1	0	0
R5	0	0	0	0	0	0

R	2	V	Local variety				
	P1	P2	P3	P4	P5	P6
R1	M	1	1	0	1	1
R2	1	1	1	1	1	0
R3	1	1	1	1	1	1
R4	0	1	1	1	1	1
R5	1	1	0	1	1	1

R	3	V	huay_bong_60				
	P1	P2	P3	P4	P5	P6
R1	0	0	0	0	0	0
R2	0	1	0	0	0	0
R3	0	1	0	0	0	0
R4	0	0	1	0	0	0
R5	0	0	0	1	0	0

	V	ku50				
	P1	P2	P3	P4	P5	P6
R1	0	1	0	0	0	0
R2	0	0	1	0	0	0
R3	M	0	0	1	0	1
R4	0	0	0	1	0	0
R5	0	0	0	0	0	0

	V	sc9				
	P1	P2	P3	P4	P5	P6
R1	0	1	0	1	1	0
R2	0	0	0	0	0	1
R3	0	0	0	0	0	0
R4	1	0	0	0	0	0
R5	0	0	0	0	0	0

	V	km98-1				
	P1	P2	P3	P4	P5	P6
R1	0	0	0	0	0	0
R2	0	0	0	0	0	0
R3	0	0	0	0	0	0
R4	0	0	0	0	0	0
R5	0	0	0	0	0	0

	V	km98-1				
	P1	P2	P3	P4	P5	P6
R1	0	0	0	0	1	0
R2	0	0	0	0	0	0
R3	0	M	0	0	0	0
R4	0	0	0	0	0	0
R5	0	0	0	1	0	0

	V	rayong_72				
	P1	P2	P3	P4	P5	P6
R1	0	0	0	0	0	0
R2	0	0	0	0	0	0
R3	0	0	0	0	0	0
R4	0	0	0	0	0	0
R5	0	0	M	1	0	0

	V	sc8				
	P1	P2	P3	P4	P5	P6
R1	0	0	0	1	1	1
R2	1	0	0	1	1	1
R3	0	0	0	0	1	0
R4	0	1	1	1	1	0
R5	1	1	1	1	0	0

	V	Local variety				
	P1	P2	P3	P4	P5	P6
R1	1	0	1	1	1	0
R2	1	1	1	1	1	1
R3	0	1	1	1	1	1
R4	0	1	1	1	1	1
R5	1	1	1	1	0	1

	V	ku50				
	P1	P2	P3	P4	P5	P6
R1	0	0	0	0	0	0
R2	0	M	0	M	0	0
R3	1	0	0	1	0	0
R4	0	0	0	M	0	0
R5	0	0	0	0	0	0

	V	Local variety				
	P1	P2	P3	P4	P5	P6
R1	1	1	1	1	1	1
R2	1	1	1	1	1	0
R3	1	1	1	1	1	1
R4	1	1	1	1	1	M
R5	1	1	1	1	1	1

	V	sc9				
	P1	P2	P3	P4	P5	P6
R1	0	0	0	0	0	1
R2	0	0	0	0	0	0
R3	0	0	1	0	0	0
R4	0	1	0	0	0	0

	V	sc9				
	P1	P2	P3	P4	P5	P6
R1	M	0	1	0	0	1
R2	0	1	M	0	1	0
R3	1	1	1	0	M	0
R4	0	0	0	M	1	1

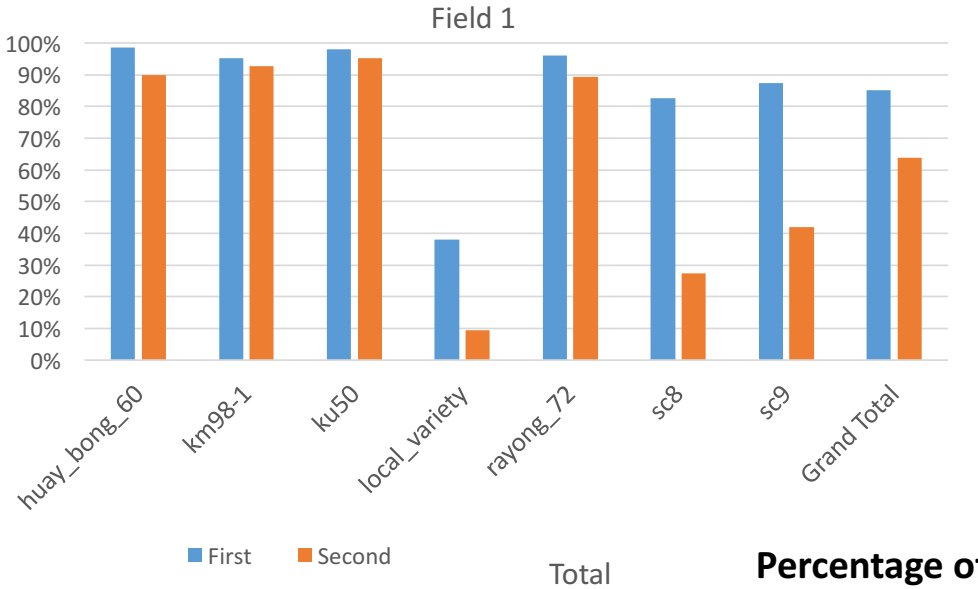
	V	rayong_72				
	P1	P2	P3	P4	P5	P6
R1	0	0	0	0	0	0
R2	0	1	0	0	0	0
R3	0	0	0	0	0	0
R4	0	0	0	0	0	0
R5	0	0	0	0	0	0

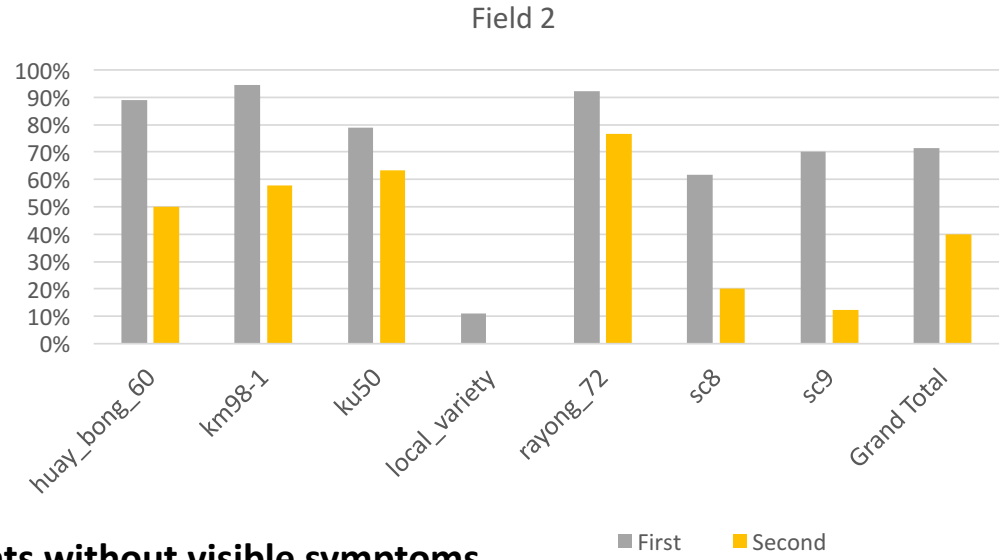
Example of the data at 1st observation

Comcare app designed rapidly

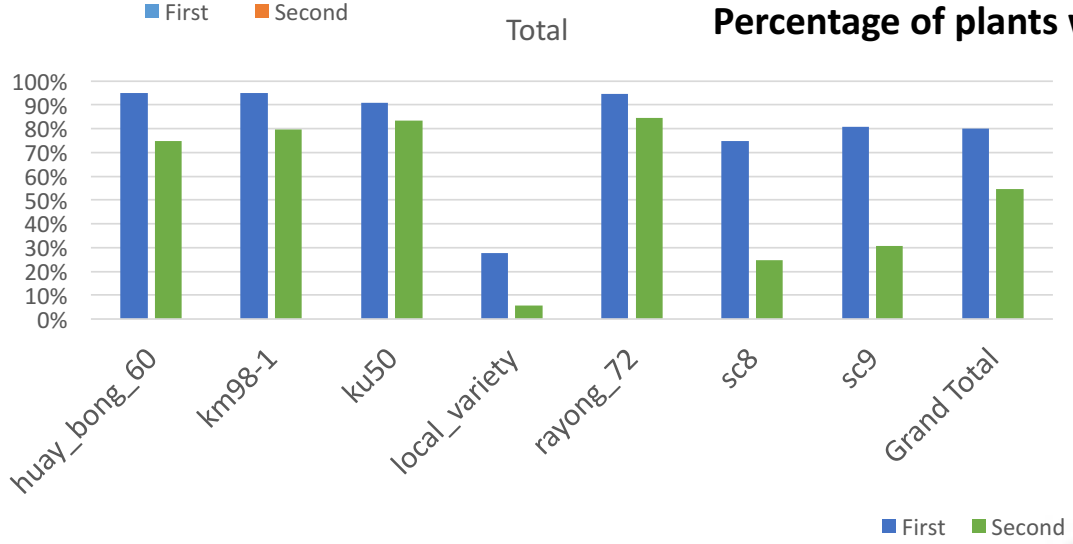
Need to think about better way to set up case management of large samples for applications like this in the future.

Result





Percentage of plants without visible symptoms



DNA fingerprinting shows that sc8 & sc9 are the same variety

Our vision, a sustainable food future

	V	rayong_72		R	1		V	km98-1		R	2		V	huay_bong_60		R	3	
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
R1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	V	ku50		R	1		V	sc9		R	2		V	km98-1		R	3	
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
R1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	M	0	0	0	0	0	0	0	0
R3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	M	0	0	0	1	0
R5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
	V	km98-1		R	1		V	rayong_72		R	2		V	sc8		R	3	

Sampling across the plots – 10 samples

PCR assessment shows many plants that did not display typical symptoms had the virus

Eg. Rayong 72 during the first visual assessment didn't show high incidence but did with PCR analysis

Results from PCR diagnosis

	Infection rate (%)		Asymptom rate (% of infected)	
Variety	Location 1	Location 2	Location 1	Location 2
Huay Bong 60	6.7	0.0	100	0.0
KM98-1	6.7	5.6	100	100
KU50	0.0	0.0	0.0	0.0
Farmer's Local Variety	76.7	88.9	26.1	20.0
Rayong 72	43.3	61.1	84.6	81.8
SC8	16.7	27.8	80.0	60.0
SC9	16.7	66.7	40.0	58.3

PCR assessment shows many plants that did not display typical symptoms had the virus

Eg. Rayong 72 during the first visual assessment didn't show high incidence but did with PCR analysis

Observation on Local Variety (sweet)>>>

Thanks for your attention!