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# Status on assessment of CMD Resistant varieties in Vietnam and Thailand: Implications for short, medium and long-term plans


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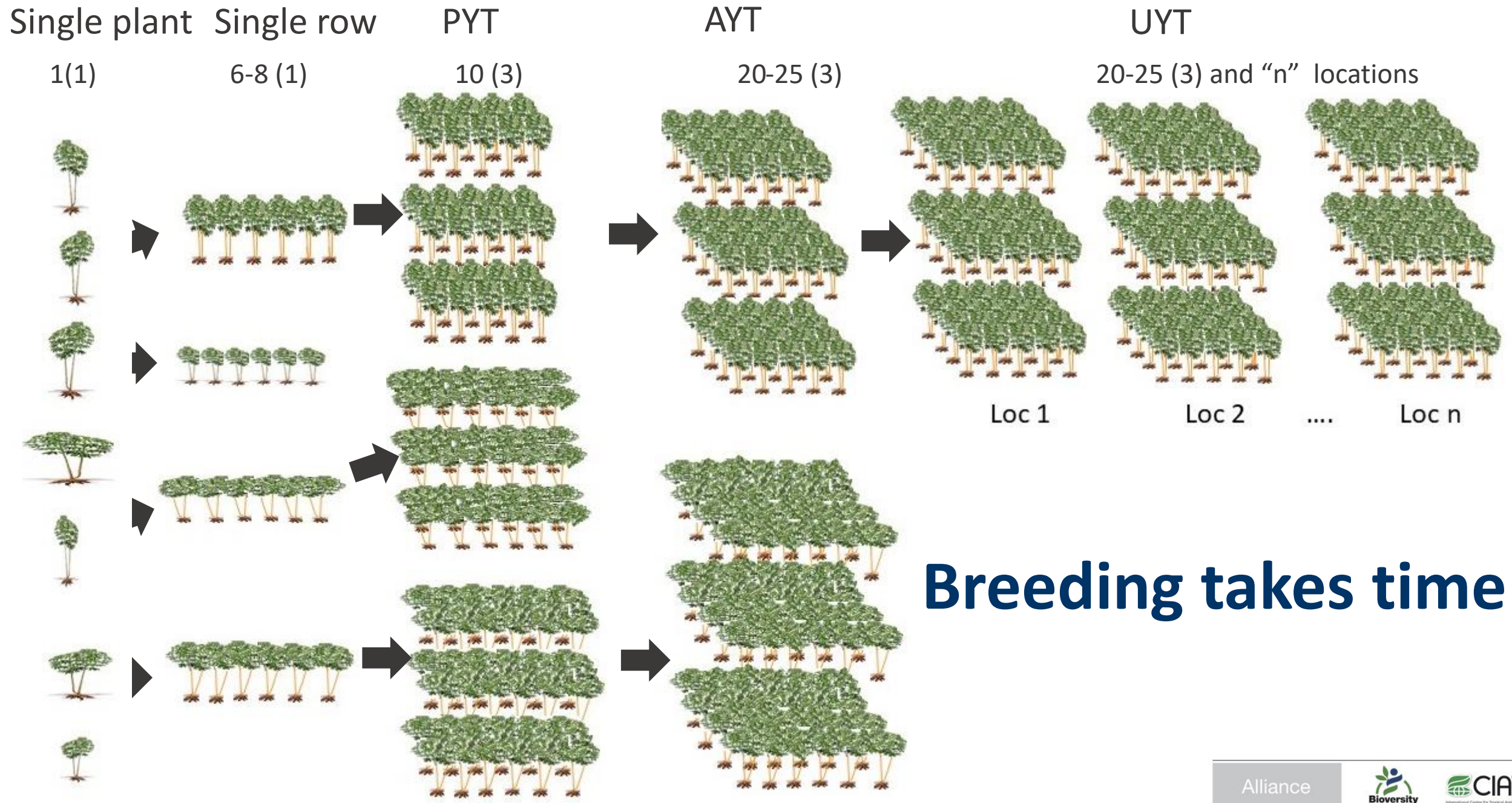
# Component 2 - Breeding




# Breeding takes time!

# Phased strategy to get resistant varieties into farmers fields as quickly as possible

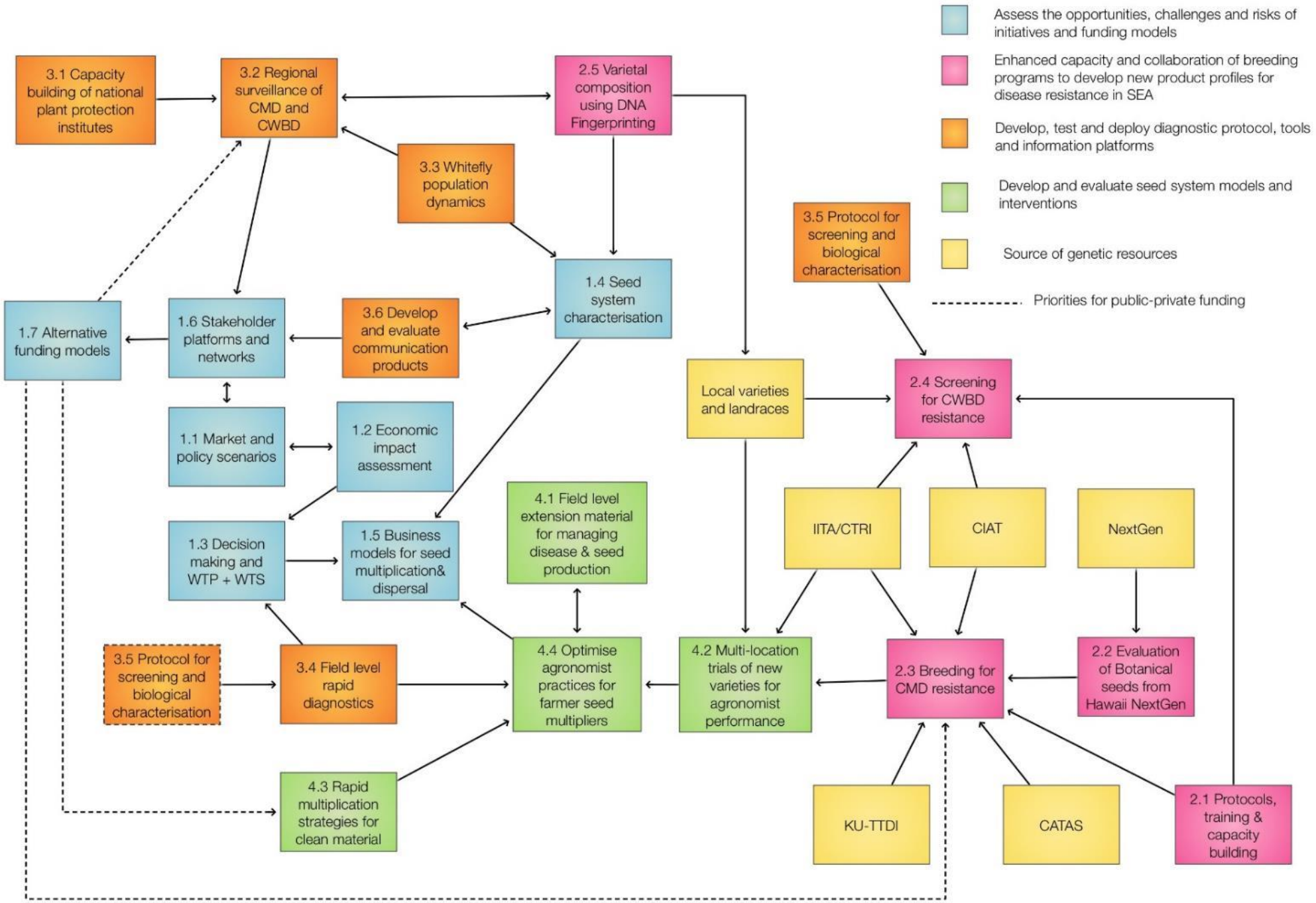
1. Determine the best existing elite Asian cassava variety for rapid multiplication

2. Evaluate existing resistant varieties and clones from outside Asia.
   *Under strict phytosanitary protocol for the movement of genetic material*

3. Develop new varieties through conventional breeding with national cassava breeding programs in Thailand and Vietnam

# Agenda

- Presentation of results and analysis from Vietnam – Xiaofei Zhang
- Presentation of results and analysis from Thailand – Chalermpol Phumichai
- Presentation agronomic trials in Kampong Cham, Cambodia – Sok Sophearith
- Discussion on implications for short, medium and long-term strategies
  - Short - What varieties are we currently recommending in different location and under different levels of disease pressure? Status of release?
  - Medium -What varieties should be in multi-location trials in 2022 and needs to be sent to Laos and Cambodia?
  - What is being prioritized in crossing-block designs?


Assess the opportunities, challenges and risks of initiatives and funding models
Enhanced capacity and collaboration of breeding programs to develop new product profiles for disease resistance in SEA
Develop, test and deploy diagnostic protocol, tools and information platforms
Develop and evaluate seed system models and interventions
Source of genetic resources
Priorities for public-private funding
3.1 Capacity building of national plant protection institutes
3.2 Regional surveillance of CMD and CWBD
2.5 Varietal composition using DNA Fingerprinting
3.3 Whitefly population dynamics
3.5 Protocol for screening and biological characterisation
1.4 Seed system characterisation
1.7 Alternative funding models
1.6 Stakeholder platforms and networks
3.6 Develop and evaluate communication products
Local varieties and landraces
2.4 Screening for CWBD resistance
1.1 Market and policy scenarios
1.2 Economic impact assessment
4.1 Field level extension material for managing disease & seed production
IITA/CTRI
CIAT
NextGen
1.3 Decision making and WTP + WTS
1.5 Business models for seed multiplication& dispersal
3.5 Protocol for screening and biological characterisation
3.4 Field level rapid diagnostics
4.4 Optimise agronomist practices for farmer seed multipliers
4.2 Multi-location trials of new varieties for agronomist performance
2.3 Breeding for CMD resistance
2.2 Evaluation of Botanical seeds from Hawaii NextGen
4.3 Rapid multiplication strategies for clean material
KU-TTDI
CATAS
2.1 Protocols, training & capacity building

Investment in “Future Stems” at NAFRI research station

Facilitate Industry & Donor visits and training at Future Stems

Leverage Public- Private Partnerships in supply zones

Establish local source of disease-free stems and new varieties

Awareness raising and capacity building in surveillance, diagnostics and extension for rapid response

Sale of stems to smallholder farmers

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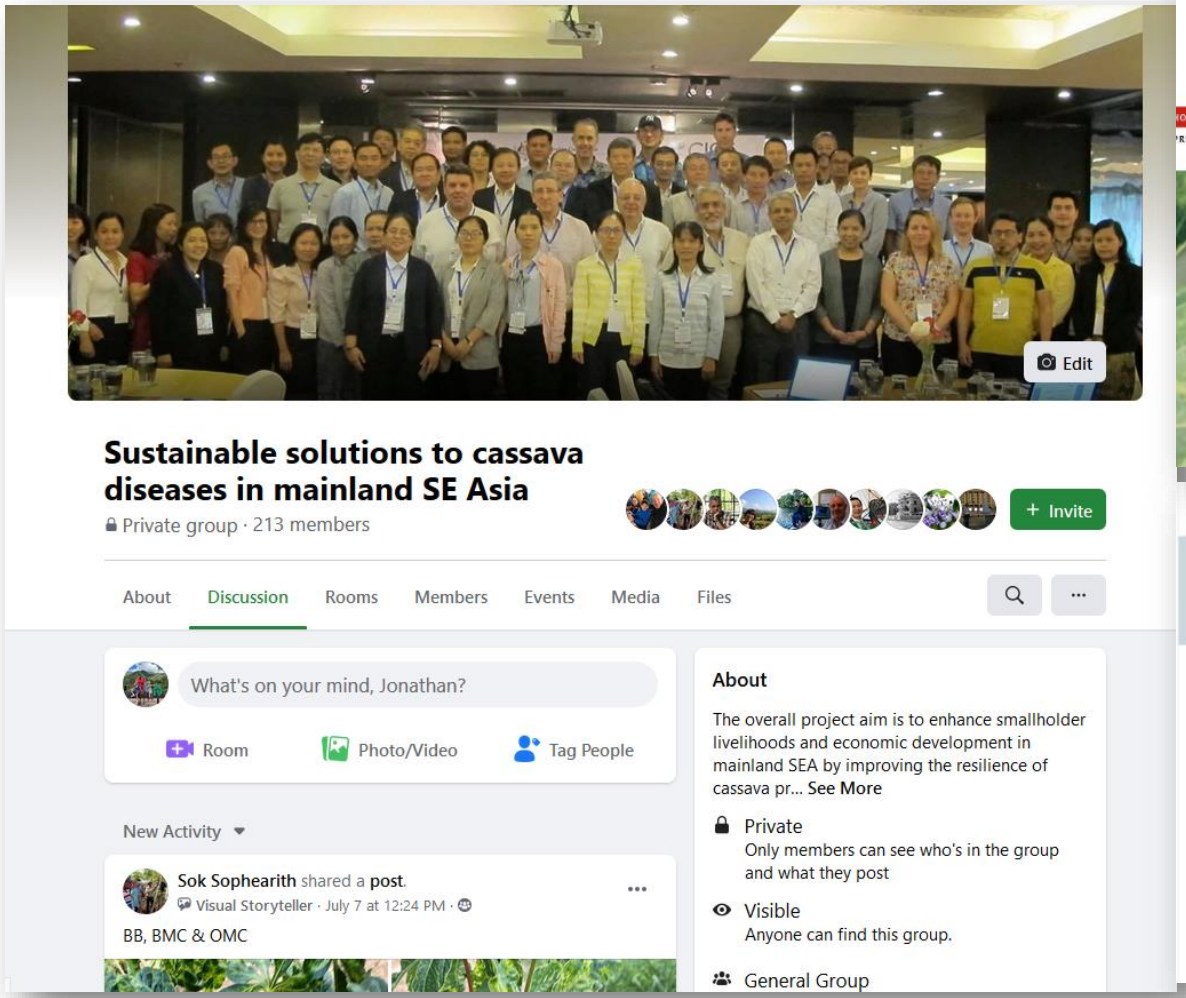
# Stay connected to activities and results

https://cassavadiseasesolutionsasia.net/ -



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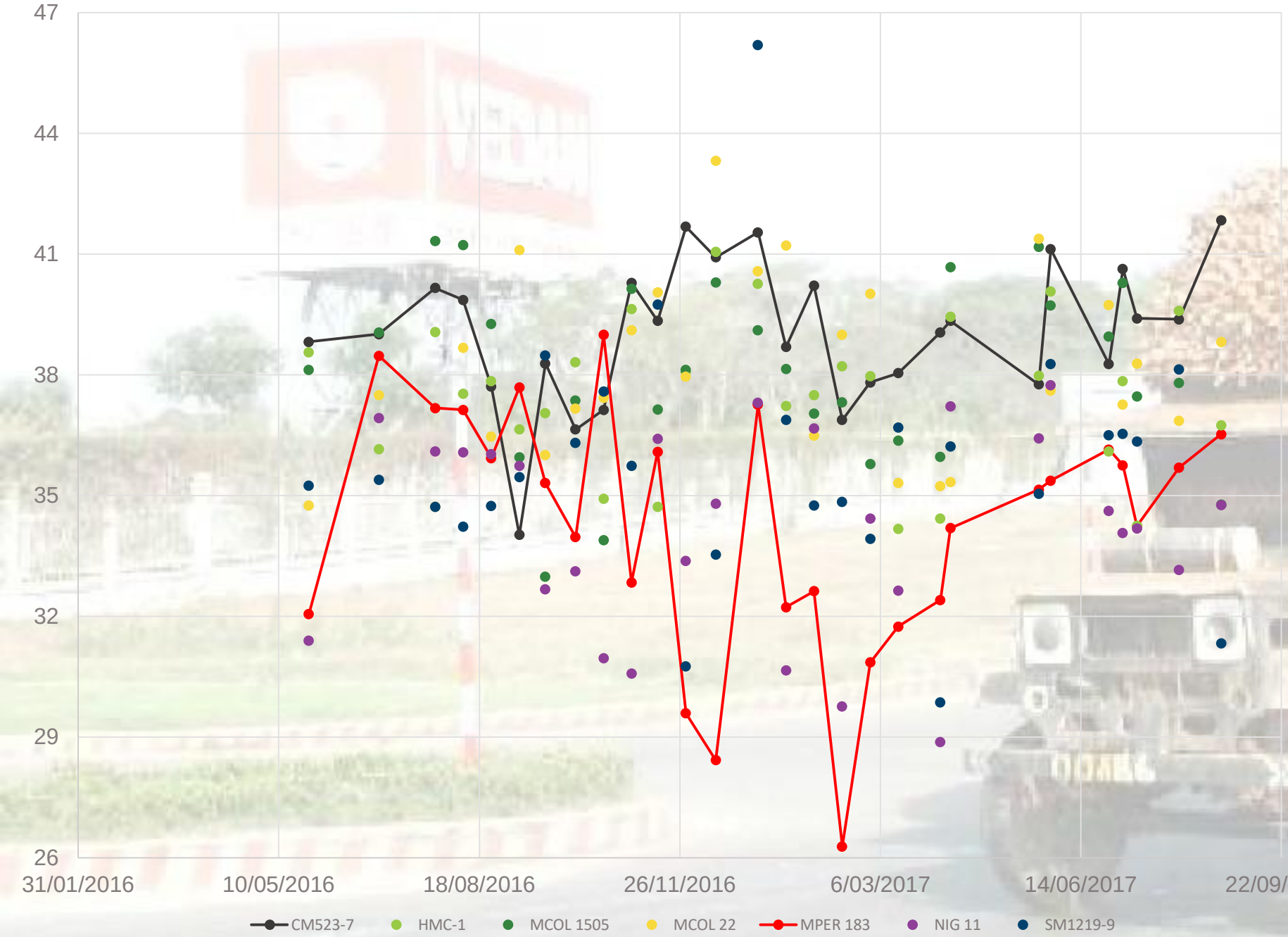
# Progress – but no silver bullet at this stage

| genotype | germination | CMD_10mon | height | height_1st_branch | branch_number | root_number | starch | yield | starch_yield |
|---|---|---|---|---|---|---|---|---|---|
| TMEB419 | 92.3 | 1.0 | 333.2 | 282.5 | 1.0 | 44.0 | 28.3 | 36.4 | 10.5 |
| VN19-254 | 98.8 | 1.3 | 309.3 | 319.3 | -0.1 | 33.4 | 25.8 | 36.4 | 9.2 |
| IBA980581 | 97.3 | 1.1 | 372.7 | 205.1 | 1.0 | 60.2 | 24.0 | 34.5 | 8.9 |
| CR27-20 | 95.5 | 1.0 | 306.8 | 175.6 | 2.8 | 29.2 | 28.1 | 26.3 | 8.1 |
| CR24-16 | 99.1 | 1.0 | 335.1 | 354.8 | -0.1 | 57.4 | 29.0 | 26.6 | 8.0 |
| AR18-1 | 77.0 | 1.1 | 354.2 | 287.5 | 2.0 | 36.5 | 23.8 | 27.8 | 8.0 |
| CR13-8 | 96.8 | 1.0 | 356.9 | 190.6 | 3.0 | 32.3 | 27.7 | 27.6 | 7.7 |
| AR9-48 | 92.8 | 1.0 | 365.6 | 291.4 | 2.3 | 34.9 | 25.8 | 27.6 | 7.3 |
| IBA972205 | 93.3 | 1.0 | 352.8 | 117.4 | 3.5 | 31.2 | 23.8 | 27.5 | 6.6 |
| AR35-1 | 96.3 | 0.9 | 359.7 | 210.4 | 2.5 | 28.9 | 26.5 | 23.7 | 6.5 |
| CR25-4 | 95.7 | 0.9 | 345.9 | 328.6 | 1.0 | 27.9 | 28.2 | 22.6 | 6.3 |
| KM505 | 84.4 | 2.7 | 315.9 | 286.4 | 0.7 | 12.1 | 28.5 | 20.6 | 6.0 |
| KM419 | 100.9 | 3.7 | 221.2 | 200.2 | 0.6 | 12.3 | 27.2 | 13.2 | 4.2 |
| KM94 | 100.9 | 4.0 | 322.2 | 241.0 | 0.5 | 16.3 | 28.3 | 26.8 | 7.9 |
| KM140 | 99.7 | 2.7 | 238.5 | 221.5 | 0.3 | 34.7 | 24.2 | 24.6 | 6.7 |
| CR24-3 | 95.8 | 1.0 | 350.4 | 139.8 | 2.9 | 30.5 | 25.1 | 32.9 | 8.0 |
| CR52A-4 | 100.1 | 0.9 | 332.2 | 116.7 | 3.0 | 52.7 | 28.2 | 27.1 | 7.7 |

5t starch/ha

=$114 million USD/year in Tay Ninh alone

Dry matter content (%) from seven genotypes harvested every other week through 15 months

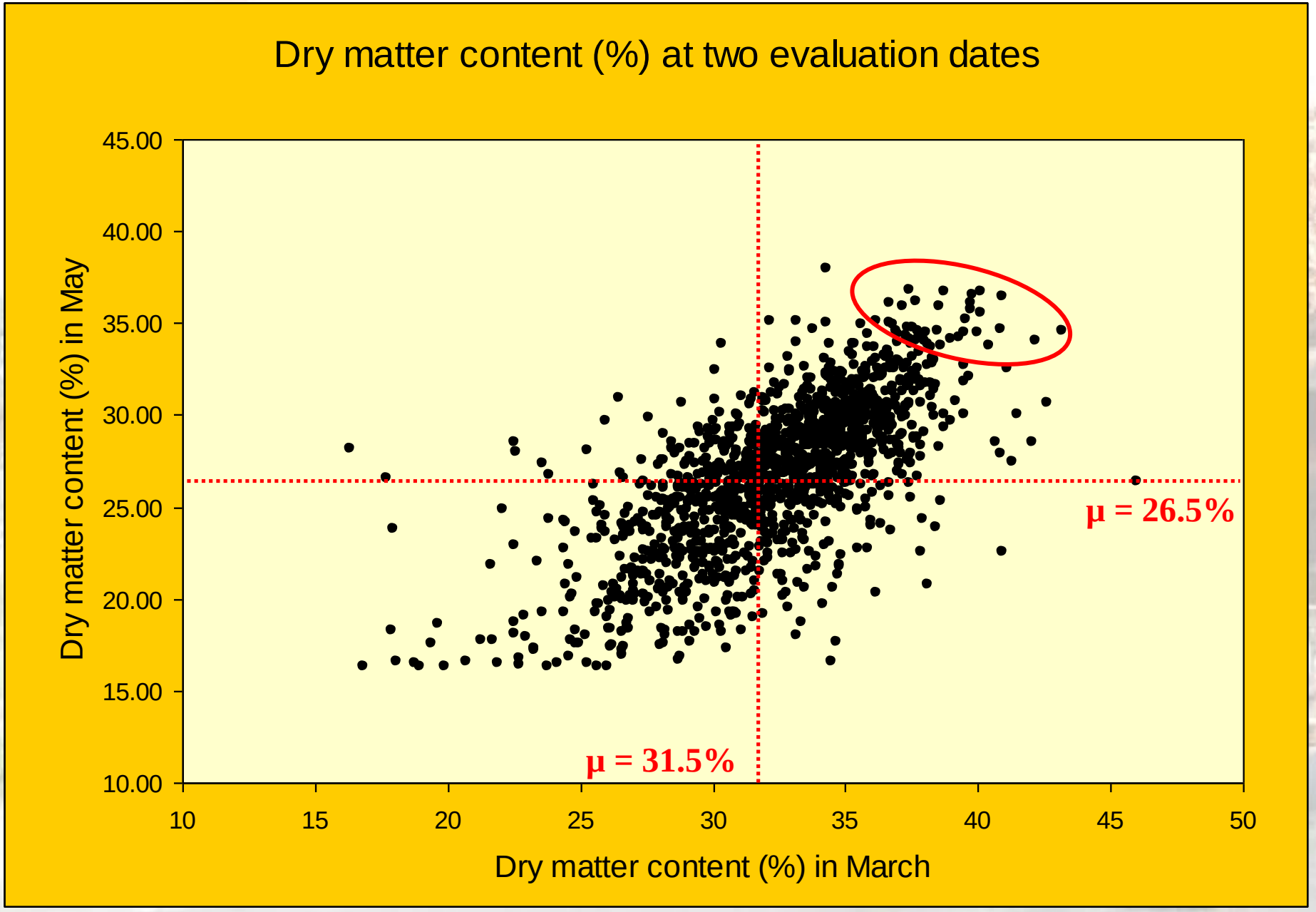



Average = 39.1
St. Dev. = 1.72

Average = 34.4
St. Dev. = 3.07

EVENTUALLY, if enough data is available, we may detect the kind of genetic differences that can be exploited

# 3.2 Developing clones with high and stable DMC



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