Mid-Term Review

Objective 3: Surveillance and Diagnostics

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International Center for Tropical Agriculture
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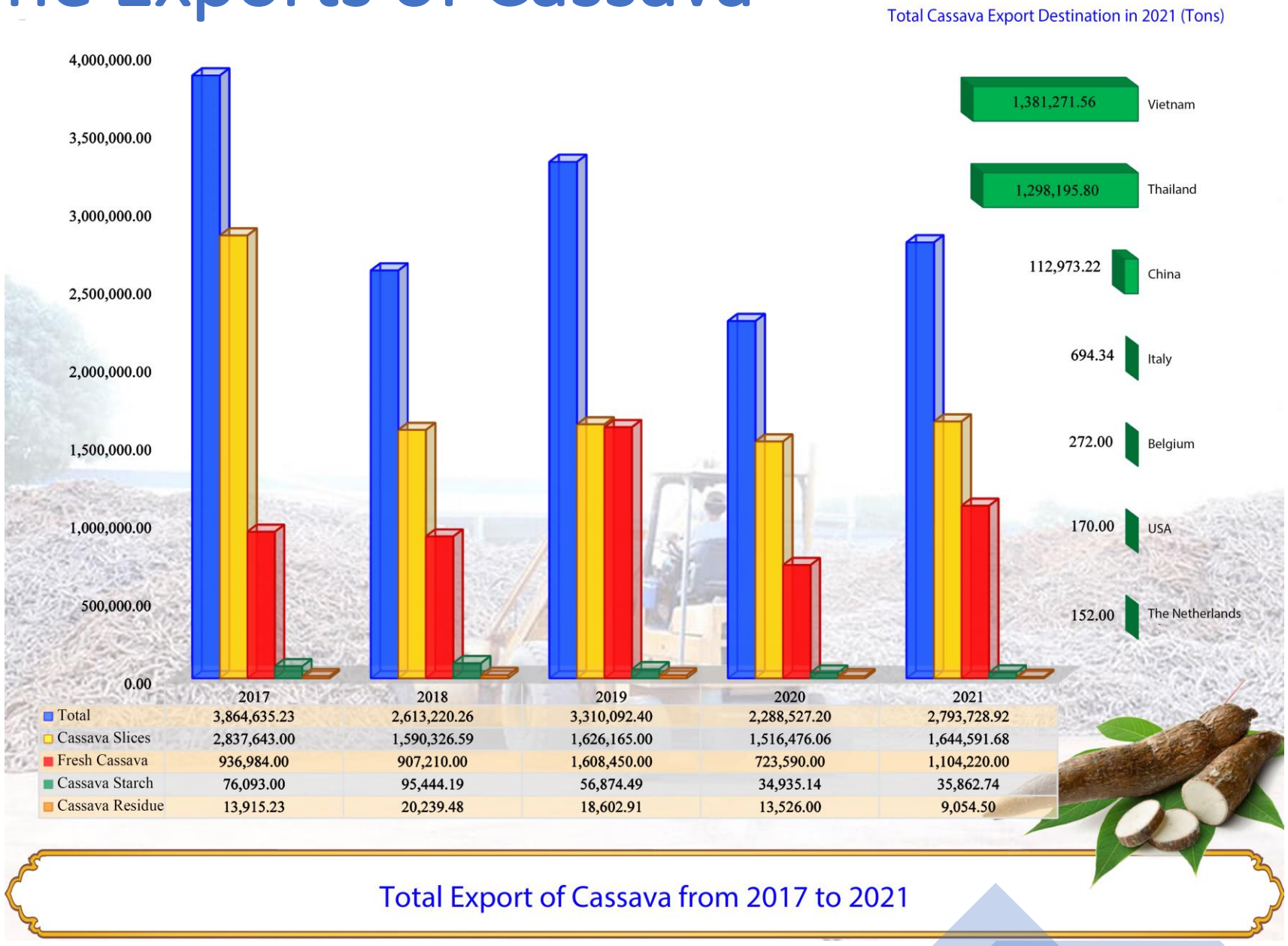
Outlines

1. The Exports of Cassava
2. Site Surveillance and Protocols
3. CMD and CWBD Surveillance
4. Other Pest/Diseases Found during Surveillance
5. Challenges
6. Next Activities

1. The Exports of Cassava

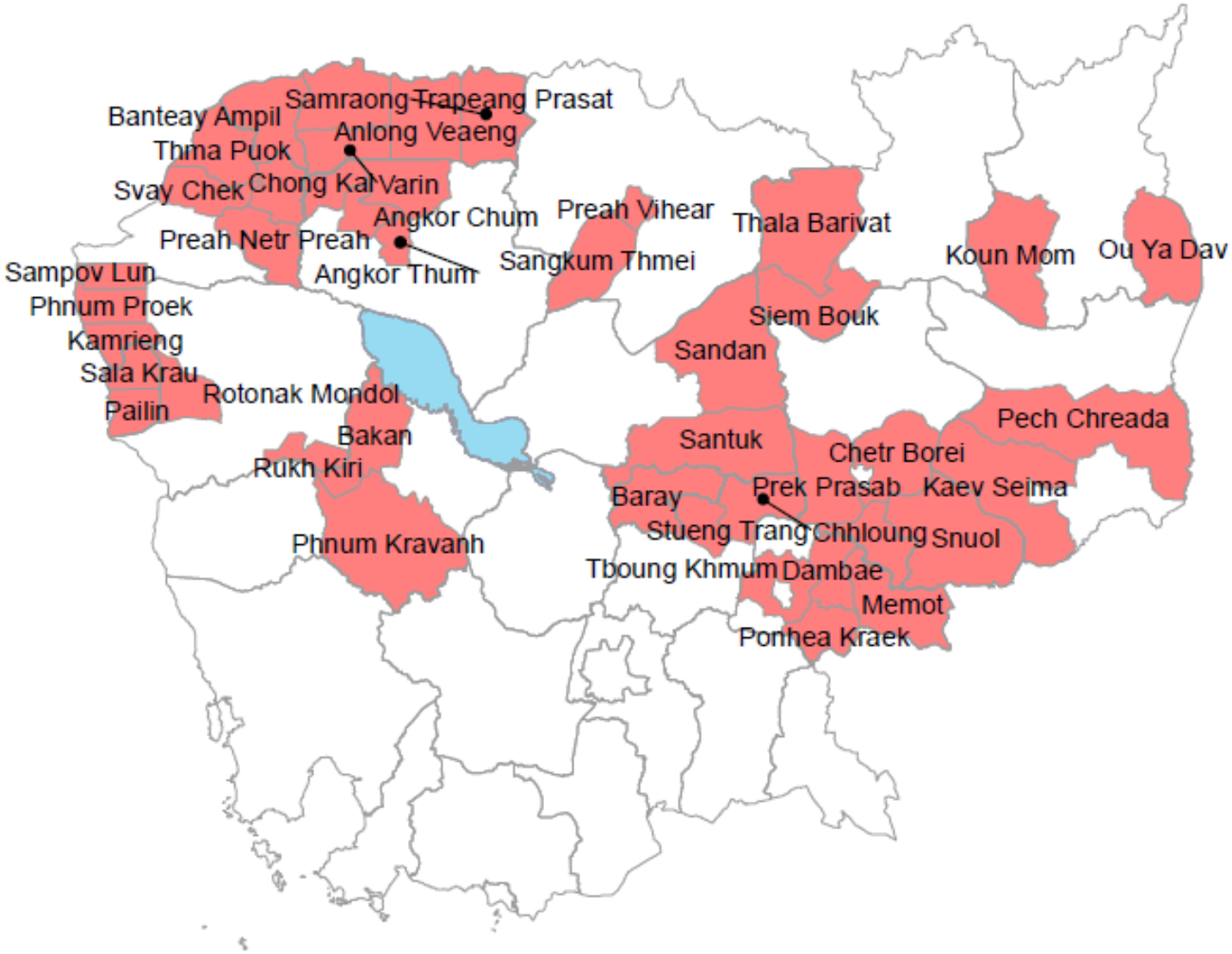


Total Export of Cassava from 2017 to 2021

2. Site Surviellance & Protocols

There are 14 provinces that selected to conduct CMD and CWBD.

1. Banteay Meanchey
2. Battambang
3. Odor Meanchey
4. Pailin
5. Preah Vihear
6. Pursat
7. Siem Reap
8. Kampong Cham
9. Kampong Thom
10. Kratie
11. Mondulkiri
12. Ratanakiri
13. Steung Treng
14. Tboung Khmum



Map: Jonathan Newby

Surveillance Protocols

- The field sampling protocol is follows by CIAT-Virology-Crop Protection Protocol v2.0 (*Wilmer J. Cuellar and Maria I. Gomez*)

Field sampling: Whiteflies, Cassava Mosaic Disease (CMD) and Cassava Witches' Broom Disease (CWBD)

Wilmer J. Cuellar; Maria I. Gomez, Virology Laboratory, Crops for Nutrition and Health, International Center for Tropical Agriculture (CIAT), The Americas Hub, Colombia.

Before you go to the field

1 -Prepare the following materials

- Ziploc bags of 10 x 10 cm (see figure below). Each bag should have written the Date, Field and Location identifiers e.g. 01/06/20; F1; Tay Ninh.
- Prepare each Ziploc bag with 20 g of silica gel.
- You should collect 60 leaf samples per field (see below) and each bag can contain 4 samples. So that per each field you will have a total of 15 Ziplock bags.
- A GPS tracker or a mobile phone that can store the GPS location of photographs (be sure you have your phone with 100% battery or acquire an external charger).
- Tissue paper. 1.5 mL eppendof tubers (for collecting whiteflies), ethanol 80%, water-proof

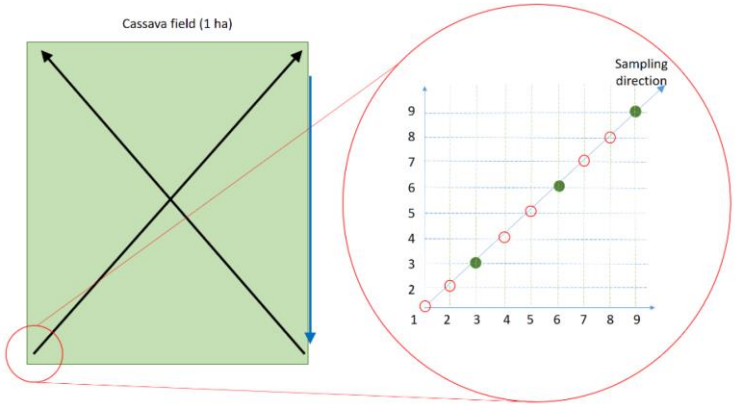
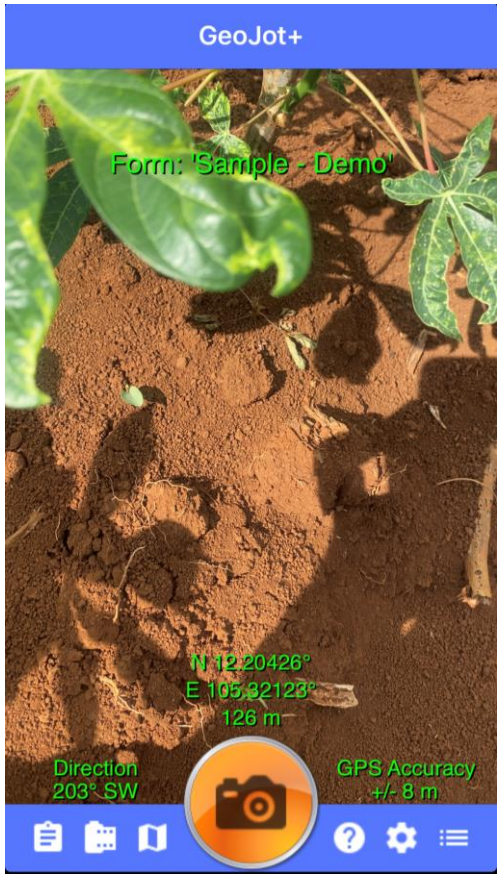
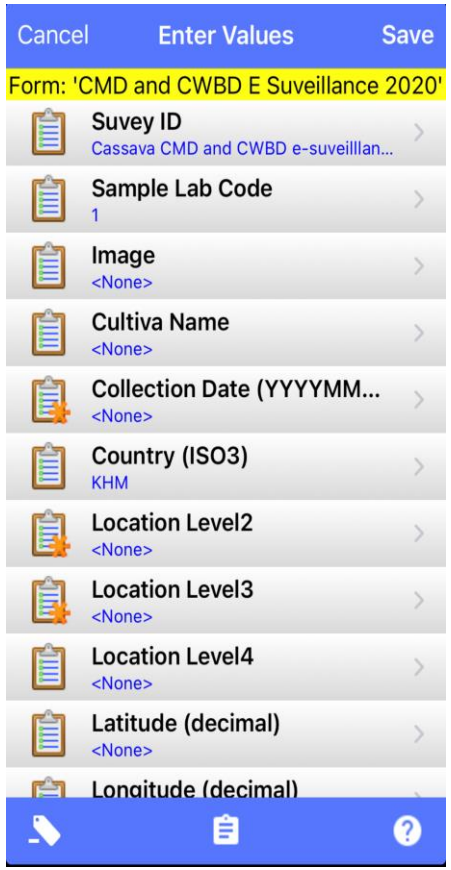


Figure 3. Sampling for CMD (photographs and top leaves) will follow the X pattern indicated by the back arrows (left panel). Sampling for whteflies (photographs and whitefly collection) should follow only one diagonal (one black arrow). The blue arrow indicates the direction to follow (aprox 100 plants) before starting sampling in the second diagonal. For fields smaller than 1 ha, one should adjust the sampling (every second plant or every plant in the diagonal, but not the final number of samples collected.

Field Data Collection to Report





Targets: CMD, CWBD and WF

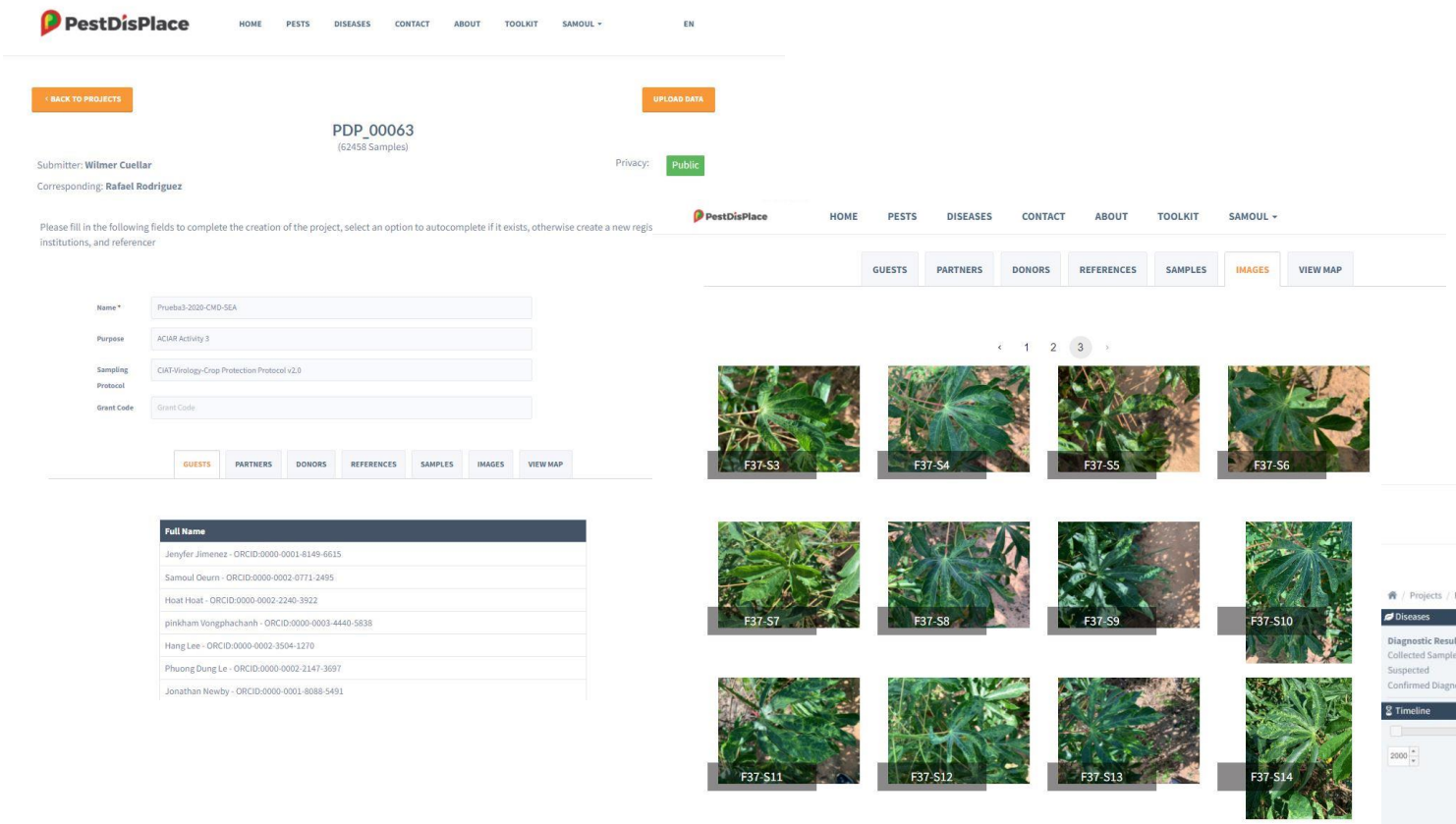
Leaf mosaic and deformation

Leaf yellowing, short petioles

Photo: Dr. Wilmer J. Cuellar

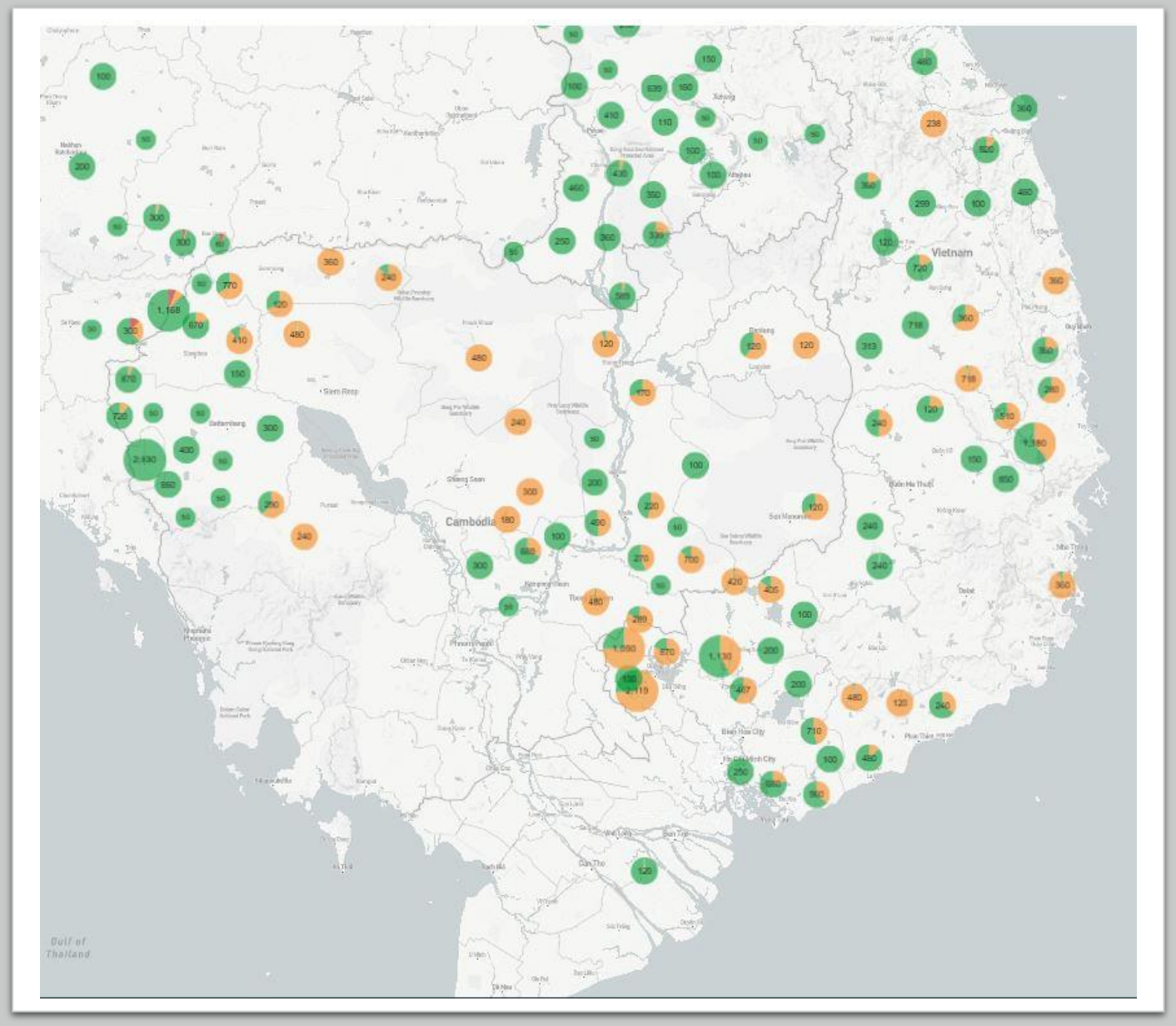
Information platforms: data integration and communication

https://pestdisplace.org

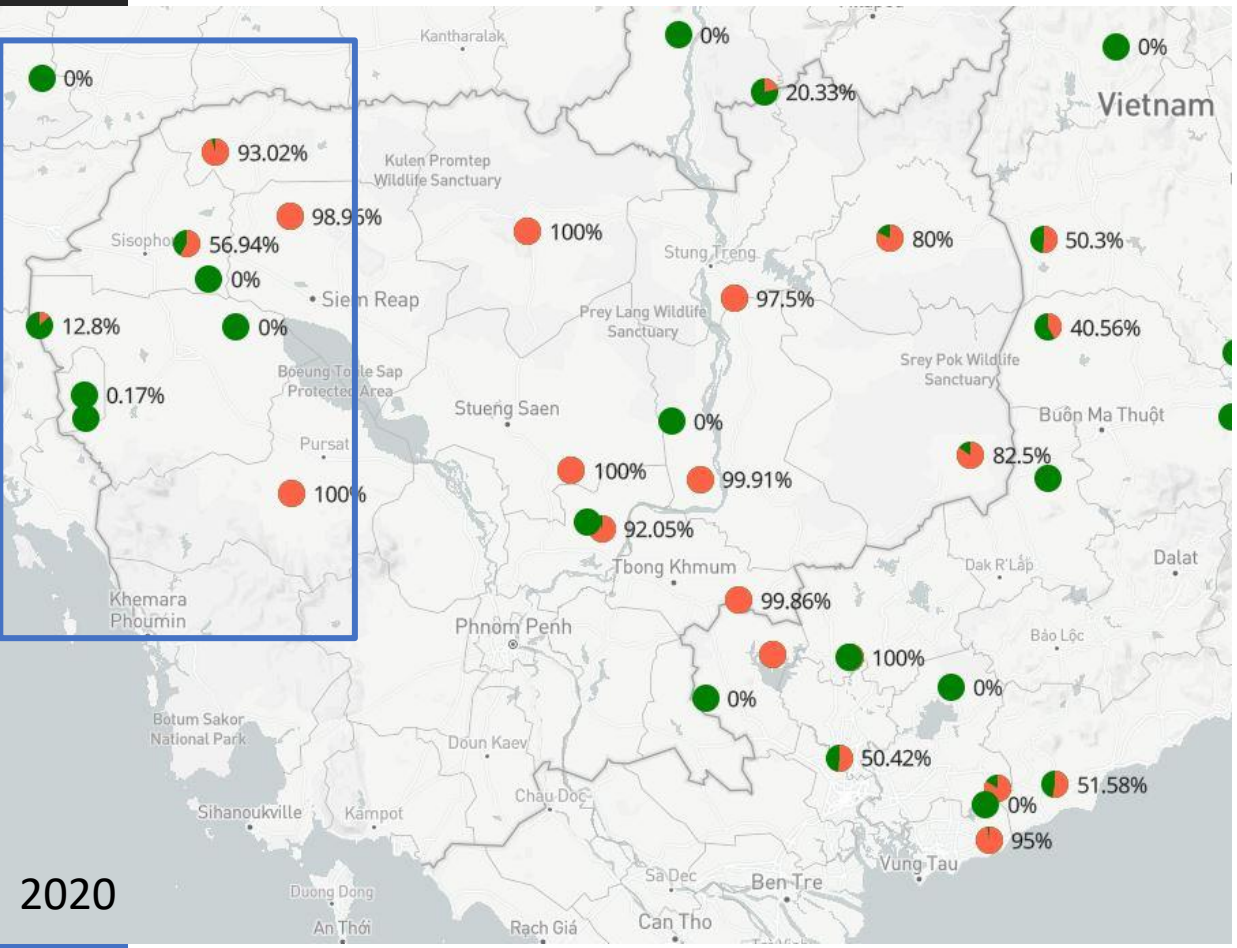


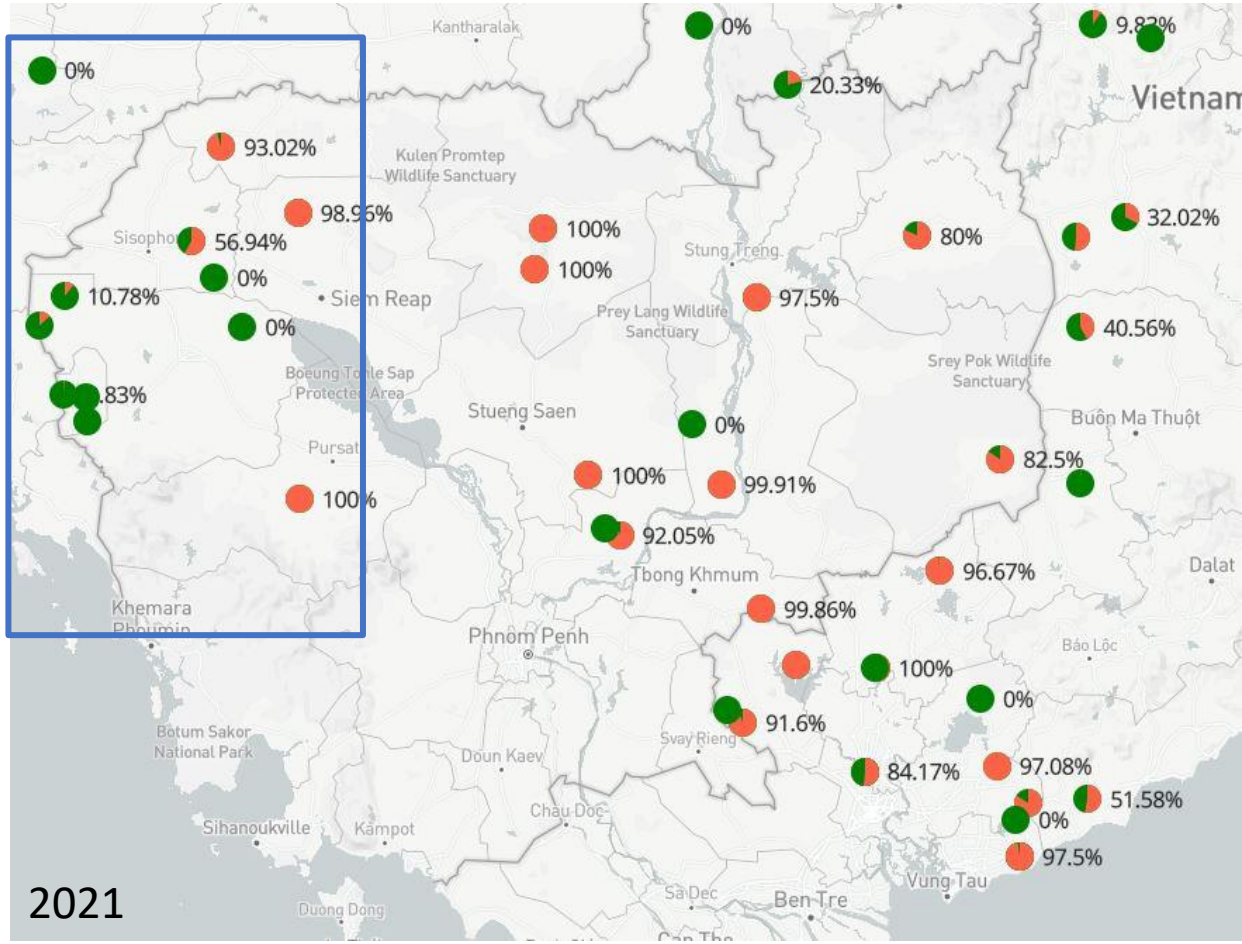
3. Surveillance

- Two consecutive years (2020-2021).
- Photo records ‘observations’ allow the identification of CMD and CWBD symptoms.
- Around 18000 ‘observations’ in 2020 and 3360 ‘observations’ in 2021 (more observation will be added)

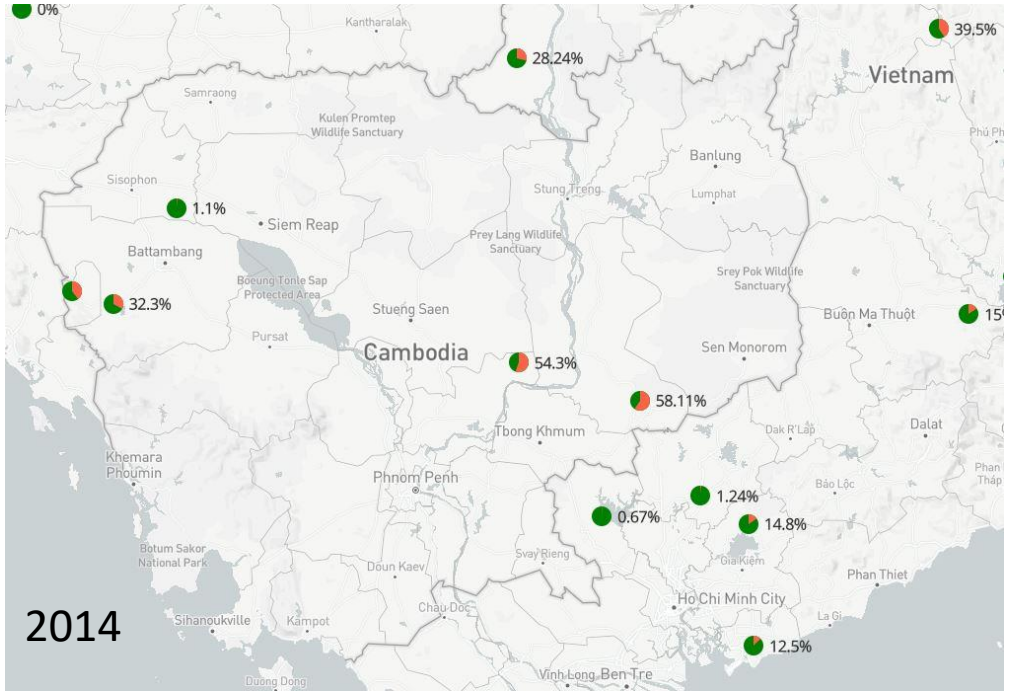


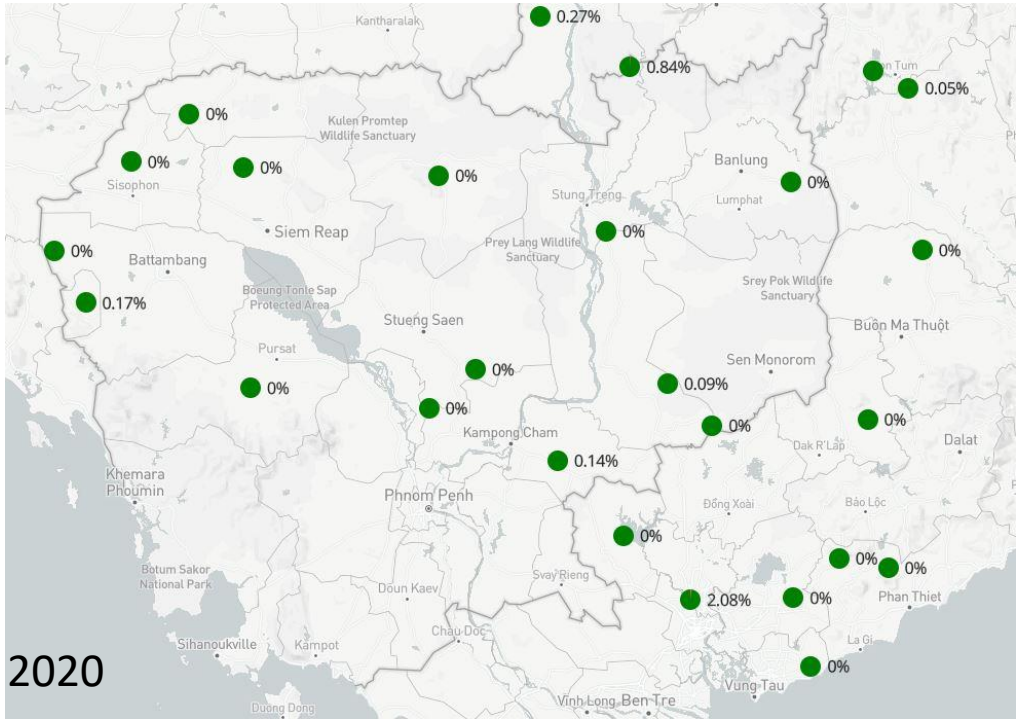
Incidence maps: CMD

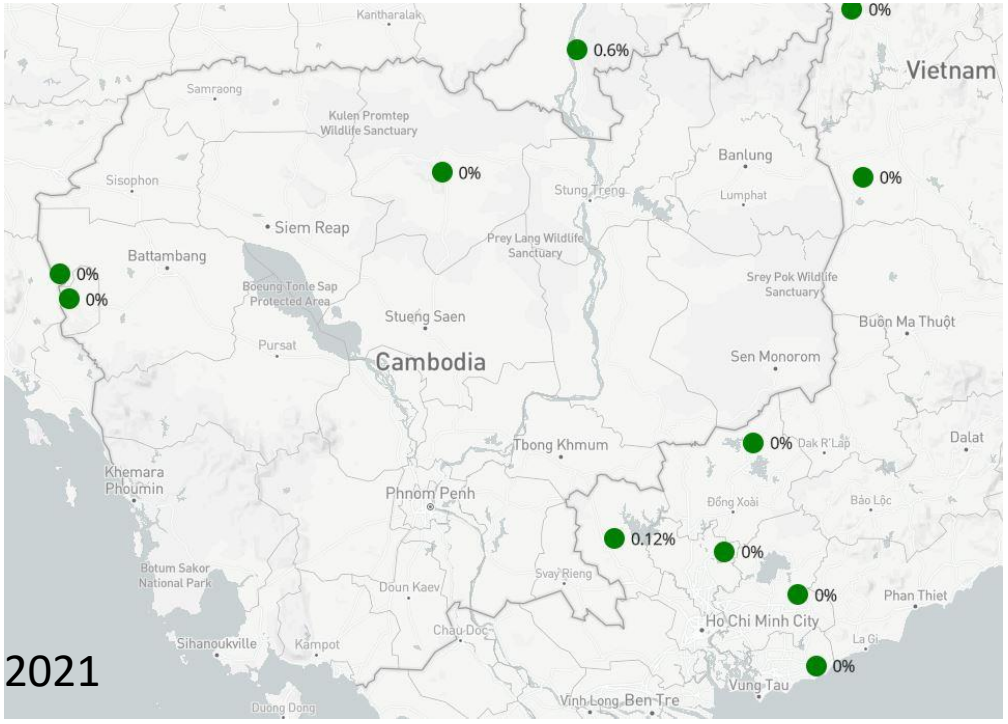




Incidence maps: CWBD







Whiteflies (WF)

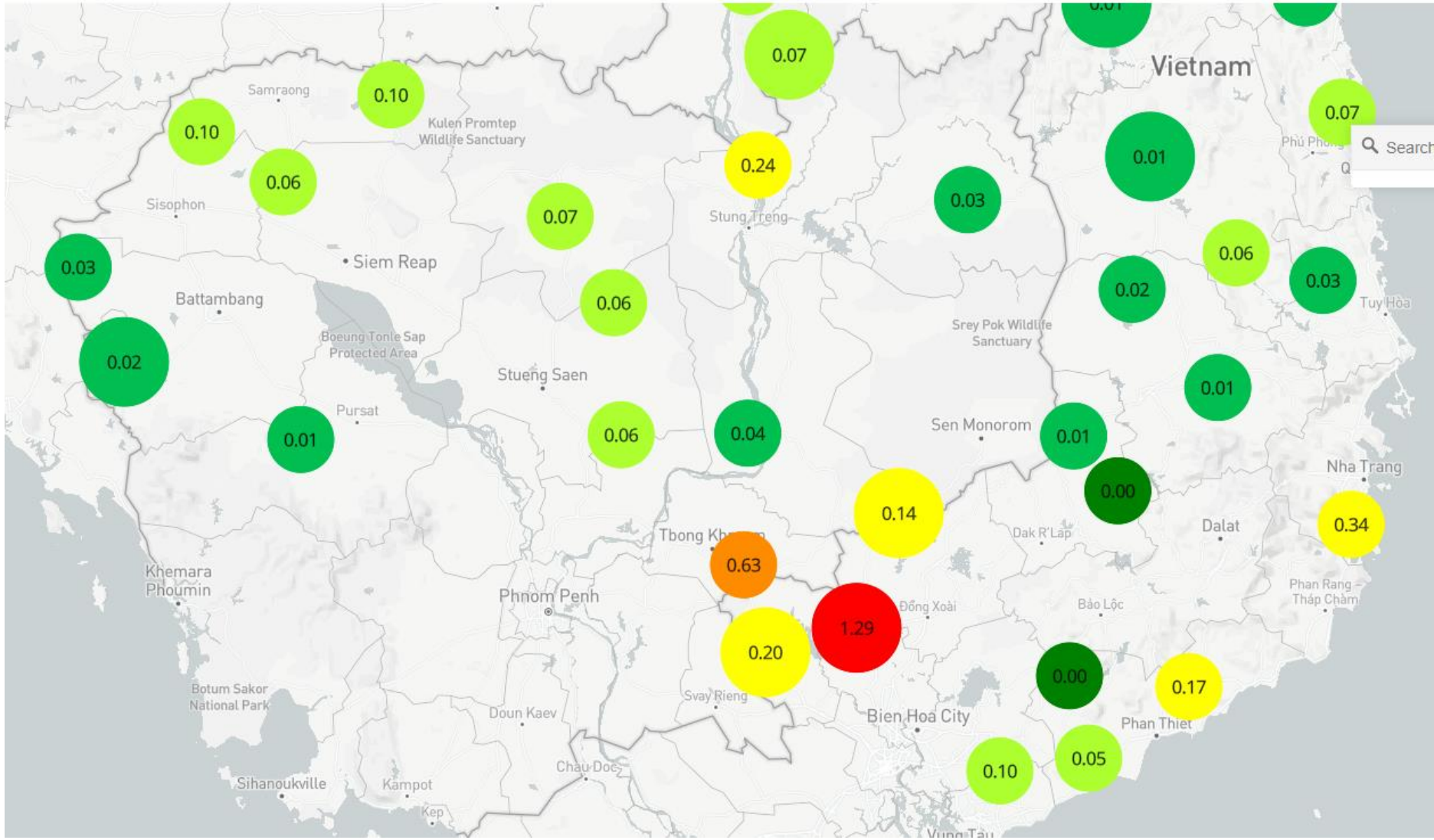
In the last years in Cambodia and Vietnam, the outbreaks of CMD caused by SLCMV were found to be associated with *Bemisia tabaci* Asia II 1 whiteflies, the only known efficient vector for SLCMV (Wang et al., 2016; Uke et al., 2018; Y. Chi et al., 2020)

A fast, efficient and standardized method was established for the surveillance of whiteflies and diseases. For WF, 30 plants were evaluated following a diagonal:

- In 2020 around 4500 ‘observations’ and 840 ‘observations’ in 2021 (more observation will be added)

Whitefly relative abundance (Adults/second leaf/plant)

Range	
0	
>0	<=0.04
>0.04	<=0.11
>0.11	<=0.5
>0.5	<=1.1
>1.1	<=20



4. Other Pest/Diseases Found during Surveillance

1. Cassava Bacterial Blight Disease
2. Mealybugs

(Photo Fen Beed, CABI)

(Photo Rob Reeder, CABI)

5. Challenges

- The weather (heavy raining, hot…)
- Traveling and communication
- Covid-19 pandemic
- Lack of technical officers on molecular identification

6. Next Activities

- Continue to CMD and CWBD and Whitefly suveillance
- Preparing and sending the whitefly sample and cassava leaf sample from Cambodia to CIAT for molecular identificaiton and further research.

Thank You