Connecting shade, disease and productivity in Western Ghana – A case study

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Introduction

- Cocoa production in West Africa is one of the main economic sources;
- Shade provided by shade trees is known to influence the incidence of disease and pests and the overall productivity in cocoa trees;
- Despite recent advances, there is still much to learn about the relationship between shade trees and cocoa;
- This MSc research project aims to observe the link between different shade levels and the incidence of disease/pests and productivity of the cocoa trees, in a community in Western Ghana.

Materials and Methods

- The field work was done in the Bepokokoo community, on the outskirts of Asankragua, Wassa Amenfi West, in a period of 5 weeks, between November 18 and December 20, 2019;
- 6 cocoa farms were used in this project, due to limited time and early harvesting, which led to a limited number of farms with enough cocoa pods in the trees
- In each farm, 3 circular plots (12,5 m radius) were demarcated and inside 20 trees were randomly selected and tagged (Fig. 1). The 3 plots differed in level of shade tree canopy cover: ”No shade”; “Low shade” (between 10%-40% shade cover); ”High shade” (more than 40% shade cover);

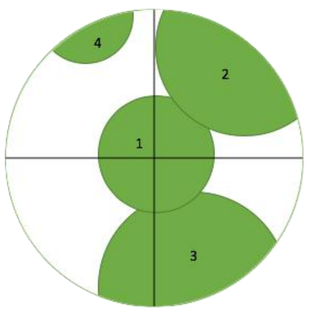

Fig. 1 - Example of circular plot with estimated shade tree crowns (dots mark cocoa trees)

- Data collected from cocoa trees included Diameter at Breast Height (DBH) and distance to the nearest shade tree;
- Data collected from shade trees included species name, DBH, crown area (Fig. 3) and distance to the center of the plot;
- The cocoa trees were evaluated once a week for 4 weeks for the presence of:
  Phytophthora pod rot (a.k.a. black pod)
  Cocoa Swollen Shoot Virus Disease (CSSVD)
  Mirids and mirid damage;
- The total number of pods was also counted;

Materials and Methods (cont.)

- Between weeks 2 and 3 of the disease assessment the trees were harvested and the number of cocoa pods harvested per tree was counted. The viable pods were also differentiated among the total number of harvested pods;
- An additional survey was done with the owners of the farms in question.
- The questions were divided into 5 categories:
  Section 1: Land use
  Section 2: Management practices
  Section 3: Disease and pest management
  Section 4: Shade trees
  Section 5: Income and cocoa yield

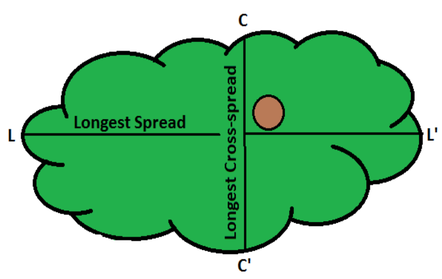

Fig. 2 - Illustration of crown spread measurements

Fig. 3 - Symptoms of:
A – Black pod
B – Mirid damage
C – CSSVD

Results and Discussion

In process

Acknowledgements

- To the Plant Production Systems group (WUR), in particular my supervisors Dr. Marieke Sassen and Dr. Danae Rozendaal.
- To everyone at IITA for the support and guidance throughout the field work, in particular Dr. Richard Asare for making this partnership possible
- To the people at the Cocoa Research Institute of Ghana (CRIG) for sharing their knowledge on disease and pests in cocoa trees.

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