MILD STRAIN CROSS-PROTECTION OF COCOA IN GHANA

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INTRODUCTION

- Cocoa swollen shoot virus disease (CSSVD) is major limiting factor of cocoa production in Ghana and causes one of the most economically important plant diseases in the world.
- Despite attempts for over 60 years to control the disease by removing affected and contact trees, the disease is still spreading.

MILD STRAIN CROSS-PROTECTION

- Mild strain cross-protection has been used to control citrus tristeza virus in Brazil and elsewhere.
- Cross-protection against tomato mosaic virus has been used in glass house crops in several countries including UK, the Netherlands and Japan

CROSS-PROTECTION IN COCOA

- The cross-protection concept was not new in cocoa research in Ghana when the extensive work to exploit the phenomenon started. Crowdy and Posnette (1947) and Posnette and Todd (1951, 1955) demonstrated that mild strain of CSSV could protect cocoa trees against severe strains. Although the results then were promising the atmosphere at the time was not ripe to use it.

CROSS-PROTECTION IN COCOA

- The concept was thus revived in the early 1980s Cocoa Research Institute of Ghana. More mild strains were collected from Eastern Region of Ghana and together with existing mild strains experiments were conducted both in the gauze houses and the field to test the concept.

Mild strain cross-protection concept

- The concept is similar to human immunization where mild or dead form of viruses causing human diseases are put in human being to promote the production of antibodies which neutralise the effects of the severe strains in case people are infected by the viruses.
- Plants do not produce antibodies but is believed that the mild strains occupy the multiplication sites in the plant thus preventing the severe ones from multiplying thereby disintegrate.

Effects of mild strains on growth and yield

- Mild strain cross-protection trials on growth and yield of cocoa at CRIG evaluated over the years indicated that some of the mild strains used did not affect the growth and yield of the cocoa.
- Two mild strains N1 and SS365B initially exhibited growth and yields that were significantly higher than the healthy controls
- In addition, cocoa variety T85/799 X Pa7/808 was consistent in having better growth and yield than the other varieties used

Conclusion

- Though the trials were promising, the technology has still not been transferred to cocoa farmers in Ghana for the following reasons

1. Effective methods for mass inoculation with mild strains have not been achieved
2. Farmers refused to accept the concept on the condition that unless government would pay them compensation for any reduced yields. Secondly, in case the concept failed and their farms are grubbed and replanted, then government should pay them the yields they would have lost before the farms are re-established and starts yielding again

Thank you