



Vector Control (CSSV(D)) – A perspective from Ghana

H. Dzahini-Obiatey

Cocoa Research Institute of Ghana, Akim
Tafo, Ghana



Introduction

- The search for vectors of CSSV started in 1943 (Cotterell, 1943) i.e. soon after the disease was found to be caused by a virus
- The search culminated in the identification of the insect vector – the mealybugs (Pseudococcidae) (Box, 1945)
- Up to date (in Ghana), Pseudococcidae is still the only family of mealybugs known to transmit CSSV.
- So far more than 20 species from this family have been found capable of transmitting CSSV



Vector control

- Attempts at targeting mealybugs as a way of controlling CSSVD started just when it became clear that this insect (mealybug) is vector of the disease.
- Chemical insecticides were tested and/or reported by (Nicol, 1952; Hanna & Nicol, 1954; Hanna & Heatherington, 1957; Hanna et al., 1955, 1959; Dale, 1962)



Vector control

- Chemical insecticides were tested and/or reported by (Nicol, 1952; Hanna & Nicol, 1954; Hanna & Heatherington, 1957; Hanna et al., 1955, 1959; Dale, 1962)
- Biological agents tested (Nicol et al., 1950; Ackornor, 2002)



Chemical insecticides

- A systemic insecticide, dumefox (bis(dimethylamino)fluorophosphate oxide) was efficacious both in laboratory and field studies but – **it was toxic to human handlers/ tainted chocolate or left residues in it/ It was also phytotoxic to the cocoa tree/ and worse of all, it was not cost effective from field trials conducted = abandoned.**
- What next for chemical trials?



Biological agents

- The biological agents tested included pathogenic fungi such as *Aspergillus parasitica*, *A. flavus* and *A. niger* (Nicol et al., 1950).
- It was found out that *A. parasitica* could kill *Planococcoides njalensis* in 90 min in the laboratory but there are no records of any follow up field experiments.
- Donald (1956), Harris (1966) and Duffour (1991) found *Coccodiplosis coffeae* as the commonest predaceous Cecudintiidae that attacks cocoa mealybugs.
- In 2000 (Ghana), a renewed interest in pathogenic fungi, parasitoides and other predatory insects. (Ackornor, 2002).



Biological agents

- Ackornor's studies did not only affirmed *Coc. Coffeae* as predaceous to mealybugs, others such as *Scymnus (Pullus) / majusculus* Mader and *Hyperaspis egregia* were found predaceous to *P. citri*.



References

- Ackonor, J. B. (2002). *Insect Sci. Applic.* 22, 105-112
- Box, H. E. (1945). *Nature* **155**, 608-609.
- Cotterell, G. S. (1943). Entomology section. *Report Central Cocoa Research Station Tafo 1938-1942* pp. 51-54.
- Dale, W. T. (1962). *In: J. B. Wills (Ed.) Agriculture and land use in Ghana*, Oxford University Press, London, pp 286-314. Hanna, A. D. and Heatherington, W. (1957). *Annals of Applied Biology* 45, 473-480.
- Donald R. G. (1956). *J. West Afr. Sci. Assoc.* 2, 48-60
- Dufour B. (1991). Place et importance de differencetes espèces d'insectes dans l'ecologie du CSSV au Togo. *Cafe, Cacao, Thé* Vol XXXV No. 3
- Hanna, A. D. and Nicol J. (1954). *Nature* 173, 730-731
- Hanna, A. D., Judenko, E. and Heatherington, W. (1955). *Bulletin of Entomological Research* 46, 669-710.
- Hanna, A. D., Heatherington, W., Mapother, H. R. and Wickens, R. (1959). *Bulletin of Entomological Research* 50, 209-225
- Harris, K. M. (1966). *Trans. Roy. Entomol. Soc. Lond.* 118, 313-358
- Nicol, J. (1952). *Nature* 169, 120
- Nicol, J., Owen, H. and Strickland, H. (1950). *Nature* **165**, 490



Thank you