

Overview of cocoa pests in West Africa - including mealybugs

Colin Campbell

**Thames Valley Cocoa Club
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Main themes of this talk are:

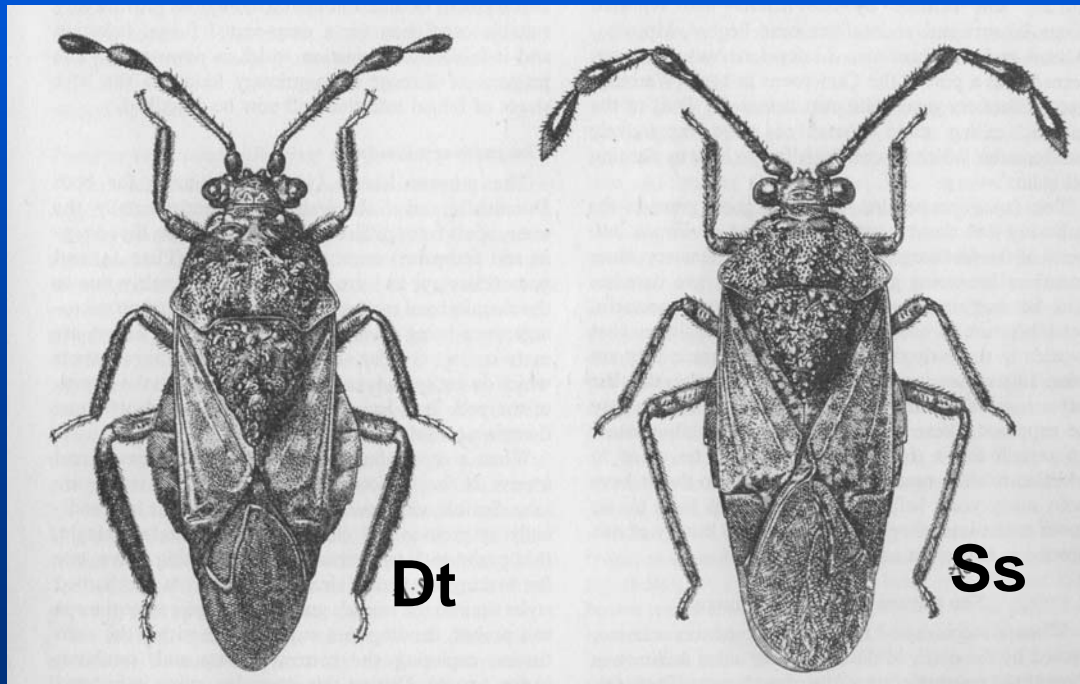
- 1. Absence of overhead shade trees leading to;**
 - Increased risk of water stress during the dry season**
 - lack of nest sites for dominant carton-nesting ants and its consequences to the mealybug vectors of Cocoa Swollen Shoot Virus Disease (CSSVD)**
- 2. Impact of new cocoa varieties.**

The major entomological causes of crop loss in West African cocoa in order of importance are:

- 1. The mirids, *Sahlbergella singularis* and *Distantiella theobroma* in association with *Calonectria* induced die-back.**
- 2. CSSVD spread by mealybug vectors**
- 3. A range of minor and secondary pests dealt with by Tony Cudjoe**

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‘Blast’ – square mile Tafo



MIRIDS

- Sustainable mirid control is essential
- Insecticides successful since the 1940's
- Loss of mirids alternative hosts may accelerate the development of resistance to pesticides
- Ecologically sustainable control is market led
- Mirid-resistant varieties may not be sustainable with *Calonectria* die-back possible
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Organic cocoa with thin broken canopy

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COCOA SWOLLEN SHOOT VIRUS DISEASE

- **Benefits from replanting with vigorous Upper Amazon hybrids partially resistant to CSSVD infection**
- **Partial-resistance also to mealybug vectors**
- **Resistance to the 2 most abundant vector species linked within progenies**
- **Relative abundance of mealybug species is changing – probably caused by climate**



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CSSVD

Changes in abundance of the mealybug vectors

Vector	Mature trees		Immature trees (progeny trials)	
	Strickland Late 1940's	Campbell 1973-8	Campbell 1975-8	Firempong 1979-81
<i>Planococcoides njalensis</i>	98.92	55.64	48.35	24.7
<i>Planococcus citri</i>	0.99	39.43	45.72	75.3
<i>Phenacoccus hargreavesi</i>	0.03	3.38	4.03	-
Others	0.06	1.54	1.09	-
Total insects	276735	15152	37551	298

- The 50:50 ratio of *P. njalensis*: *P. citri* in Ghana in the 1980's is similar to Nigeria in the 1960's
- Decline of *P. njalensis* coincided with reduced shade but also with new varieties
- *P. citri* is probably now the dominant vector of CSSVD in West Africa
- *P. njalensis* is short-legged, sedentary and dependant on ant-attendance most often on old wood
- *P. citri*, *P. hargreavesi* and 'others' are more mobile and prefer tissues at the canopy edge

Impact of shade loss on the dominant ant mosaic

- The principal mealybug attending ants are not dependent on shade trees for nest sites
- Carton-nesting *Crematogaster* spp prefer coccid species other than mealybugs
- Carton-nesting *Crematogaster* spp also prefer shade-trees for nest sites
- *Oecophylla longinoda* prefers a good canopy



Conclusions

- Mirids and CSSVD have remained the key threats to cocoa production in West Africa for 70 years.
- Good control of mirids and vigorous new varieties allows cocoa to thrive in the absence of overhead shade
- Mirids and *Calonectria* are partners
- Reduced overhead shade and new varieties favour more mobile mealybug vectors of CSSVD
- Removal of shade boosts mealybug-tending ants