POSTER SUMMARY

ARTHROPODS ASSOCIATED WITH SUGARCANE LEAF SPINDLES IN SOUTH AFRICA

WAY MJ

South African Sugarcane Research Institute, Private Bag X02, Mount Edgecombe, 4300, South Africa
mike.way@sugar.org.za

Abstract

The South African Sugarcane Research Institute (SASRI) is researching an Area-Wide Integrated Pest Management (AW-IPM) strategy against sugarcane thrips, *Fulmekiola serrata* (Kobus) (Thysanoptera: Thripidae). Unique monitoring techniques successfully implemented provided faunal complexes that might include natural enemies within leaf spindles. Twenty-eight Thysanoptera taxa from three families, namely Thripidae, Phlaeothripidae and Aeolothripidae, were distinguished. *F. serrata* were by far the predominant species. Many taxa were scarce or singletons. Anthocoridae: possibly *Orius* sp.; Staphylinidae: Oxytelinae; Chrysomelidae: Alticinae: *Chaetocnema* sp.; Curculionidae: Scolytinae; Coccinellidae: Scymninae: *Nephus* cf. *voeltzkowi* Weise and *Scymnus* sp.; Corylophidae, Formicidae: *Anoplolepis* sp.; indeterminate Lepidoptera; Cicadellidae: *Cicadulina niger* Ghauri; Laelapidae: Mesostigmata: *Ololaelaps* sp. (soil predatory mite); Araneae: Clubionidae: *Clubiona* sp.; Thomisidae: *Firmicus* sp. were recovered.

Keywords: sugarcane, Thysanoptera, Thripidae, *Fulmekiola serrata*, sugarcane thrips, South Africa

Introduction

Since December 2004 sugarcane thrips, *Fulmekiola serrata* Kobus (Thysanoptera: Thripidae), has proliferated rapidly and prodigiously throughout the South African sugar industry (Leslie and Donaldson, 2005; Way *et al*., 2006). Sampling and extraction techniques based on Bullock (1963) have been developed for this pest. This paper describes the sampling protocols and presents some preliminary findings of importance.

Methods

To sample for thrips, fields were divided into four quadrats, and five spindles were extracted 10 m apart and 5 rows along the field. All thrips and associated arthropods were collected in Ziploc® plastic bags (200x145 mm). Sub-samples from each field were collected in larger Ziploc® plastic bags (330x230 mm). Bags were kept at 0ºC in the laboratory. Initially individual spindles were examined, and later due to resource limitations 5-spindle composites were processed. Processing involved **g**ently unravelling the individual sheaths and rinsing, while agitating in warm salty water facilitated the removal of insects from between folds of the leaf spindle. Thereafter insects were filtered through fine muslin cloth (1-2 mm). The cloth was then spread onto a laminated grid for counting under the microscope.

From October/November 2005 through to March 2006, 2 699 fields of commercially grown sugarcane fields were surveyed for *F. serrata* in 13 regions of South African sugarcane to identify high infestations. From April 2006 to March 2007 field surveys continued in six regions with high infestations. In total, 53 980 spindles were examined. Spindles were all 3-4 months old. Samples were taken from cultivars common to each region. Agronomic details, *viz*. crop age (plant or ratoon), cultivar, rainfed/irrigated and locality, were recorded.

Results

F. serrata were by far the most abundant of the 318 390 thrips specimens recovered. Damage is attributed to this species. Information about *F. serrata* in this industry indicates: *F. serrata* is widespread throughout the 13 mill regions in the industry; on average 7.3 *F. serrata* were recovered per spindle; rainfed crops supported higher thrips numbers than irrigated crops; rainfed plant crops supported higher numbers than rainfed ratoon crops; similarly, irrigated plant crops supported higher numbers than irrigated ratoon crops. Certain taxa were scarce or singletons. Fifteen genera comprising 28 thrips taxa were distinguished, namely: *Fulmekiola serrata* (Kobus), *Chirothrips mexicanus* Crawford, *C. pretorianus* Hood, *C.* ?*capensis*, *Elaphrothrips edouardi* Jacot-Guillarmod, *Anaphothrips sudanensis* Trybom, *Stenchaetothrips* sp., *Exothrips* ?*setosus*, *Megalurothrips sjostedti* (Trybom), *Frankliniella schultzei* (Trybom), *Stenchaetothrips* ?*biformis* Bagnall, *Phibalothrips peringueyi* (Faure), *Arhipidothrips brunneus* Faure, *Haplothrips* ?*clarisetis brachypterus*, *H. gowdeyi* Franklin, *H. avenae/bagnalli*, *H. nigricornis* Bagnall, *H. callani/minutulus*, *H. stofbergi* Faure, *Haplothrips* sp., Tubulifera sp. 1, Tubulifera sp. 2, *Thrips australis* Bagnall, *Arorathrips mexicanus* Crawford, *Allelothrips talithae* (Faure), *Allelothrips* sp., *Podothrips* sp., *Elaphothrips* sp.

Minute pirate bugs were recovered, which were tentatively identified as the Anthocorid, *Orius insidiosus* (Say). *O. insidiosus* prey on all thrips life stages, while younger nymphs eat only thrips larvae (information from www). In South Africa, *F. serrata* numbers crash in February/March and, since *Orius* sp. are collected over this period; it might have an impact on this pest. Pirate bugs have long mobile rostrums or feeding tubes that fold under the body. The most commonly encountered species are brown to black with white patches on the wing cases. Females are about 3 mm long, while males are slightly smaller. *Orius* is highly mobile in the crop.

An indeterminate genus and species of rove beetle (Staphylinidae: Oxytelinae) were recovered; these are generalist predators preying probably on sugarcane thrips. *Clubiona* sp. (Araneae: Clubionidae) sac spiders, and *Firmicus* sp. (Araneae; Thomisidae) were collected, which are wandering spiders; these are beneficial agricultural pest controllers. Mites (Laelapidae, *Ololaelaps* sp.) were recovered; however, their role is unknown.

Discussion

Monitoring confirmed *F. serrata* as the key thrips species in this sugar industry. Coastal regions support higher numbers compared with cooler Midlands regions. Nearly all fields are infested, and most of the spindles across entire fields are attacked. It is unclear why this insect has become a major pest in a relatively short space of time. It is speculated that warmer weather produces shorter life cycles, increased oviposition and wider dispersal, all of which lead to an opportunity for population explosions. The particular features in the industry most likely to have influenced this pest include locality, planting date, variety, weather and the spatial arrangement of sugarcane.

Future work

Yield loss data are required, which will be obtained from dedicated field trials. The influence of planting date is needed in terms of peaks in thrips numbers. Possible varietal resistance to thrips needs investigation. Screening for pathogens that have the potential to be developed into biopesticides is required. The extent of movement of thrips within and between sugarcane fields needs to be investigated; this information can be used to assess the risk of spread. Use of biological organisms should be considered as an integral part of an AW-IPM programme to control this recent incursion.

Conclusions

Monitoring systems were devised for sugarcane thrips and were successfully implemented. Sugarcane thrips is the predominant species in this industry. Potential predators of thrips are present. Cognisance of this information is vital when control strategies are developed, to ensure that beneficials are encouraged. Moreover, this type of knowledge will indicate whether the implemented controls are likely to fit into the existing faunal interactions and thus be sustainable in the long term.

Acknowledgements

Contributions by Som Desraj and Kelvin Naidoo of SASRI, all Local Pest, Disease and Variety Control Committees operating in the South African sugar industry, and Michael Stiller from the ARC-Plant Protection Research Institute (Biosystematics Division) and Bruno Michel (CIRAD - Montpellier) for identifying the thrips taxa, are gratefully acknowledged.

REFERENCES

Bullock JA (1963). Extraction of Thysanoptera from samples of foliage. *J Econ Ent* 56(5): 612-614.

Leslie G and Donaldson R (2005). Scorched and yellow leaves in sugarcane. The Link, Vol. 14, No. 1, 1. Published by the South African Sugarcane Research Institute, Mount Edgecombe, RSA.

Way MJ, Stiller M, Leslie GW, Conlong DE, Keeping MG and Rutherford RS (2006). *Fulmekiola serrata* (Kobus) (Thysanoptera: Thripidae), a new pest in southern African sugarcane. *African Ent* 14(2): 410-403.