Overview of the South African stink bug problem as well as possible solutions

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Introduction

- First macadamias in South Africa 1935
- Initial research on macadamia pests ± 1980 – *Nezara viridula*
- Comprehensive research 1987 - 9 new species of stink bugs
- *Bathycoelia natalicola* and *Pseudotheraptus wayi* major pests

Introduction (continued)

- First symptoms of *P. wayi* on avocado 1987
- Damage quickly escalated since then mainly because of increases in production volumes of avocado
- Avocado and macadamia direct crop losses ± US$ 5 – 6 million/annum
- First records of *P. wayi* on litchis 2009
- Magnitude of damage on litchis, guavas and mangoes currently poorly studied

Control methods

- Initally Aldicarb and endosulfan was registered
- Currently we have a range of synthetic pyrethroids, Thiamethoxam & Pymetrozine + 2 diamide products
- 4 – 6 sprays/ season for macadamias
- No classical biological control
- Tachinids *Trichopoda pennipes* & *T. giacomelii* were introduced no significant improvement in control

Problem description (macadamias)

- Environmental concern regarding overuse of pesticides
- Resistance of lesser important pests (Tortricid moths & Citrus thrips)
- Monitoring very difficult to do (use Dichlorvos EC 100g/L as a knockdown) – results are erratic
- Bugs occur at a very low densities (range 0 – 7.7 bugs/tree/week average = 1.75)
- Most growers spray on a prophylactic basis
- Processors have a very low tolerance for damage (typically less than 2%)
- Macadamia are very tall & vigorous growing trees –making physical spraying rather difficult
- We have a burgeoning amount of small holder farmers who cannot control these pests without tractors and spraying rigs

Problem description (avocados)

- Complex of bugs occurring on this crop is not sorted out
- Until recently damage symptoms of coconut bug was mistaken for fruit fly damage.
- Fruit become more susceptible towards the end of the production season – limits the use of chemicals
- Field weathered residues of synthetic pyrethroids only control the bugs for a very short time
- Bugs migrate into orchards unabated after residue levels had worn off.
- Limited range of chemicals
- Very difficult to monitor, no pheromones
- Very wide host range – indigenous hosts largely not quantified
- Damage heterogeneously distributed in various production regions
- Low density feeder

Aspects that were previously investigated on macadamias

- Effect of tree density on stink bug damage
- Quantification of cultivar susceptibility/ tolerance
- Quantification of compensation for early season damage
- Advantages of monitoring based spraying vs. fixed interval spraying
- Damage studies (characterization and seasonality)

Aspects that were previously investigated on avocados

- Damage characterization of *P. wayi* damage
- Relative seasonal abundance of Heteroptera damage symptoms
- Quantification of link between fruit phenology and susceptibility to *P. wayi*.
- Effect of field weathered residues of synthetic pyrethroids on Heteropterans

Aspects that are currently being investigated (Stink bugs)

- On-going population survey (± 4 years)
- Website for the Nelspruit region with weekly updates and recommendations.
- Immigration patterns (attract and kill technology early in the season or perimeter sprays to reduce chemical usage)
- Vertical distribution of heteropterous and lepidopterous pests (optimise spray operations)
- Investigate the use of refugia to optimise the biological control component
- Basic decision support for farmers regarding economics of spraying
- Pheromones & chemical communication

Conclusion

- No control program can function independently
- Must integrate programme with control options for Lepidoptera and Thysanoptera complexes
- Must also integrate macadamias with other subtropical crops (avocados, mangos and litchis)
- Such a programme will have to be based on sound ecological principles otherwise it will not be successful

Greetings from Africa