Identification of a pheromone blend for the control of stink bug

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ABSTRACT
This project deals with the two major stink bug pest species found in the subtropical industry: the coconut and two spotted stink bug. Avocado is not a host for the two spotted stink bug and this report will therefore only deal with the coconut stink bug.

MATERIALS AND METHODS
A stink bug does not react to their own alarm pheromones. For this reason these compounds cannot be used to prevent the insects from entering the orchard. A very exciting prospect, however, is the influence of an alarm pheromone of one species on another species. It was found that one stink bug species dominate in the orchard at a specific time. Preliminary research indicates that the alarm pheromone of one species does have an effect on a different species. This will be investigated during 2017 as a possible technique to prevent insects from entering the orchard.

Finding the mating pheromone is very difficult because of the high concentration of the alarm pheromone. The male insect produces the mating pheromone. There are numerous literature reports stating that, when using these pheromones, it may bring insects closer to the trap but it is not effective in trapping the insects. The search for the mating pheromone will continue, but a major emphasis is currently placed on finding an attractant that simulate their food. The coconut stink bug utilises different plants during the season and the following was found at the ARC-TSC in Nelspruit:

- During the latter half of September until early November, coconut stink bug is present in mango orchards. When the mango fruit is approximately egg size, the insects migrate to adjacent avocado and macadamia orchards. It must be stipulated that once the insects migrate to the avocado orchard, it is very difficult to collect live insects and this have a major influence on the volume of research data that can be collected in a year.
- The volatile profiles of the different plants that the insects use as food sources were determined. The antennal responses towards the different pure compounds found in these plants were determined. There are, however, some of the compounds that are not commercially available and must be synthesised. During 2016, microscopy work on the morphology of the coconut bug antennae was done. This clearly verified the suspicion that the olfactory capability of this insect is very weak and emphasis was placed on electroantenographic determinations of the major components present in the different plant species.

At this stage nine different compounds were identified that gave positive antennal responses. During the 2017 season the insect responses towards these compounds will be tested, using an olfactometer to evaluate these compound mixtures as a possible food lure.

In order to fast track the development of much needed pheromone lure and trap, a mixture containing five different compounds were made, which is currently under testing in a field trial. The expertise of Insect Science regarding field testing and trap design was used and the preliminary results show that the newly desinged trap and pheromone blend does indeed attract and catch pentatomid stink bug, which include the two spotted bug. As yet, no coconut stink bug were found in the traps but the specific blend under testing is more directed towards attraction of two spotted stink bug than coconut bug.

A very important factor when designing a lure is to determine the longivity of the specific lure. Laborarory investigations regarding the release rate of the lure under field testing is currently done and will be repeated when a new reagent mixture is tested.