October 23, 2019

Dear Les

This email is to provide you an update on SRA investment and activity to assist the Australian sugarcane industry deal with soldier fly.

Genetic diversity among soldier fly populations

Until recently, our industry has had a limited understanding of the genetics of the soldier fly pest. However, through recent SRA investment, scientists have examined the genetic diversity of soldier flies collected from regions across the industry and made discoveries that could be important in the context of potential management solutions.

Soldier fly larvae were recently collected from 11 regions across Queensland and the research showed that there are five major generic groups of soldier fly, not two as expected. These groups were mostly associated with geographic location.

This research was presented in a poster to the Australian Society of Sugarcane Technologists conference earlier this year and is available here.

Research is also underway by an expert soldier fly taxonomist (Dr Bryan Lessard, CSIRO) to physically examine soldier flies to identify the number of species that the industry is dealing with.

Feeding behaviour of soldier fly larvae

Research Fellow with the University of Queensland, Dr Kayvan Etebari has been working on a SRA-funded research project to understand if soldier fly affect cane through the transmission of a virus, toxin or venom.

Because soldier fly larvae are so small, yet their damage can be very severe, it has been proposed that the larvae may be having some form of toxic effect on sugarcane.

By analysing proteins extracted from the saliva glands of solider fly larvae, Dr Etebari identified the potential for about 15 genes for proteins similar to toxins or venoms previously reported in other organisms, along with many others with unknown functions. For example, the research reported proteins similar to spider, scorpion and nematode toxins.

“While these results provide new insights into the saliva of soldier fly, it is still unknown which toxin or toxins might be the most important for feeding-induced toxicity to sugarcane,” Dr Etebari said. “Further research is required to understand how soldier flies negatively affect sugar cane growth.”

Some of this work was recently published in a journal article in Insect Science.

Variety trials

SRA has invested in variety trials in both the Central and Southern regions to better understand how different varieties respond to soldier fly. Data is currently undergoing analysis and preliminary indications suggest no clear varietal impact in the trials.

These trials are assessing varieties specific for each region and may provide an additional management option for growers in addition to the existing recommended practices, which are:

1. Take out affected blocks early in the harvest season. This will lengthen the break from cane, and destroy the larval food while the new generation is still small and vulnerable.

2. Have a grass-free break from cane, e.g. a long herbicide fallow under trash after spray-out of the old ratoon, or a short fallow followed by a non-grass crop

such as soybean. Larvae will eventually starve as grasses are their natural food.

3. Plant the next cane crop after the flight period (i.e. after June). Flies are less likely to lay eggs when there is no cane or grass during the flight period.

4. Plant sugarcane with minimum tillage following the herbicide fallow. Keep cultivation for the break-crop at minimal but adequate levels. Extra cultivation does not effectively kill soldier fly and will harm natural enemies.

5. Grow varieties with strong root systems that ratoon quickly.

6. Harvest plant and early ratoon crops when conditions are good for ratooning.

Chemical trials

SRA has also been conducting chemical insecticide trials in the Southern and Central regions to determine if any recommendations on insecticide treatment can be made in the future. Data from these trials is currently undergoing analysis by recently appointed entomologist Dr Pauline Lenancker (pictured left). This is a key appointment at SRA's Mackay research station, and you can read more about Dr Lenancker's appointment here.

SRA is collaborating with a range of growers in the trials and thanks them for their support. These include Richard Ross, Mark Weiss, Vic & Mark Zarb, Doug Mitchell, Jay Hubert, and Bundaberg Sugar.

SRA also thanks and acknowledges the assistance of Mackay Area Productivity Services and Isis Productivity Limited in conducting these trials.

For more information on any of this work, please contact SRA Key Focus Area for Plant, Disease and Weed Management, Dr Kevin Powell, on kpowell@sugarresearch.com.au or (07) 4056 4506.

Media contact: SRA Executive Manager, Communications, Brad Pfeffer 0419 175 815.

Telephone 07 3331 3333 Email sra@sugarresearch.com.au

Our address is 50 Meiers Road, Indooroopilly, Qld, 4068