

Poster paper

Improved application of imidacloprid insecticides and urea-based fertilizers

JR Hughes and D Gonzalez

Department of Agriculture and Fisheries, Mackay, Qld 4740; Email: John.hughes@daf.qld.gov.au, Daniel.gonzalez@daf.qld.gov.au

Increasing detections of the insecticide imidacloprid and dissolved inorganic nitrogen (DIN) have been reported in the Sandy Creek catchment near Mackay. Field observations by the Department of Agriculture and Fisheries (DAF) indicated that inadequate closure of the slot behind commonly used double-disc-opener/stool-splitter applicators could be one factor contributing to these increased detections in waterways. The action of double-disc openers tends to leave highly compacted sidewalls, which may exacerbate pesticide and nutrient runoff following rainfall events or overhead irrigation (with inadequate soil cover). In addition, general instructions for application of imidacloprid are not to leave the chemical exposed to sunlight and to ensure that the treated band is covered by at least 100 mm of soil and that coulter slots are filled in completely.

In this project, EHS Manufacturing were commissioned by DAF to design an effective mechanical prototype that would effectively close the slot behind double-disc-opener assemblies. This design was undertaken in collaboration with Central Coast Spreading and resulting in the successful development of the spiked closing-wheel device, commercially referred to as the StoolZippa.

Catchment Solutions were engaged to undertake rainfall simulation trials to determine variations in runoff with, and without, the closing wheel. In a trial conducted on a single soil type, rainfall simulations over three timeframes (7, 30 and 100 days after application) suggest an average 3-fold reduction in imidacloprid load (g/ha) and nearly half the runoff concentrations achieved using the closing wheel compared to an open-slot application. Similarly, average DIN (kg/ha) over the three rainfall-simulation runs with the closing wheel was nearly half that of an open-slot application.

It is acknowledged that given the low replication number further loss-pathway research is recommended over different soil types and under commercial situations. In addition, the impact of the closing wheel needs to be compared to other ways of filling in the coulter slots.

A Bayer-led efficacy trial was undertaken to determine improvements in imidacloprid efficacy between closure with the closing wheel and a treatment with no closing wheel. However, 70% of grubs were organic-feeding redhead grubs (*Dasygnathus* sp.) and, therefore, no meaningful data were obtained.

A collaborative extension program has been developed and is being delivered across canegrowing regions through DAF, Bayer, IncitecPivot Productivity Services (MAPS, BPS), NRM groups, agribusinesses and Sugar Research Australia. This project highlights how government, industry, NRM groups and commercial businesses can combine their efforts aimed at reducing the environmental impact of sugarcane production in Australia

Key words Imidacloprid, dissolved inorganic nitrogen (DIN), run-off, rainfall simulation, spiked closing wheel