



The 2010/11 Mackay Whitsunday Paddock to Reef Water Quality Monitoring Program sugarcane trials have highlighted the importance of incorporating herbicide applications with overhead irrigation or light rain and avoiding application before heavy rain events that will cause runoff.

Data from local farm trials has indicated that the 20-day period after herbicide application is critical for residual herbicide management. It was found that infiltrating rainfall or irrigation during this period will assist in reducing the amount of herbicides lost to runoff.

TRIAL DATA

A total of 3300 mm of rainfall was recorded between 1st September 2010 and 30th April 2011, well above the long-term average of 1468 mm. This resulted in 1751 mm of runoff, with the first runoff event occurring seven days after herbicide application. No rainfall was recorded in this period prior to the first runoff event.

Diuron and hexazinone were detected in relatively high concentrations in this first runoff event and then rapidly declined (Figure 1). By mid-October, within one month of herbicide application, approximately 92% of the total runoff loss of these herbicides had occurred for the wet season although only 6% of the season's runoff had occurred.

As the wet season progressed more of the herbicide moves from the trash blanket into the surface soil, making the



A Paddock to Reef Water Quality Monitoring Site at North Eton.

soil less available for runoff. Infiltrating rainfall events or use of irrigation prior to runoff will also move the herbicide into the surface soil, as was experienced at this site in the 2009/10 wet season when runoff herbicide concentrations were much lower than the 2010/11 season (maximum concentrations of 18 and 41 µg/L for diuron and hexazinone, respectively compared to 240 and 98 µg/L in 2010/11).

PADDOCK TO REEF TRIALS IN MACKAY WHITSUNDAY

The water quality monitoring sites are on two farms with different soil types that represent 44% of soils in the Mackay Whitsunday area (loam over clay and black cracking clay). Both sites are looking at the effect of row spacing (controlled traffic versus conventional), nutrition (mainly nitrogen & phosphorus) and herbicide options (knockdowns & residuals) on productivity, profitability and water quality.

The aim of the trials is to show that industry promoted current best practices will not only improve growers' profitability, but will also provide water quality benefits.

SITE DESCRIPTION

Soil type

Black cracking clay

Variety

Q208 first ratoon

Herbicide

Velpar K4 (diuron and hexazinone) applied as blanket application to cane trash on 13th September 2010 at 3.8 kg/ha.

Nutrient

CSR BKN230 @ 3.3 m3/ha (200 kg N/ha) 1.5 metre row spacing, harvested on 3rd September 2010, Green cane trash blanketed

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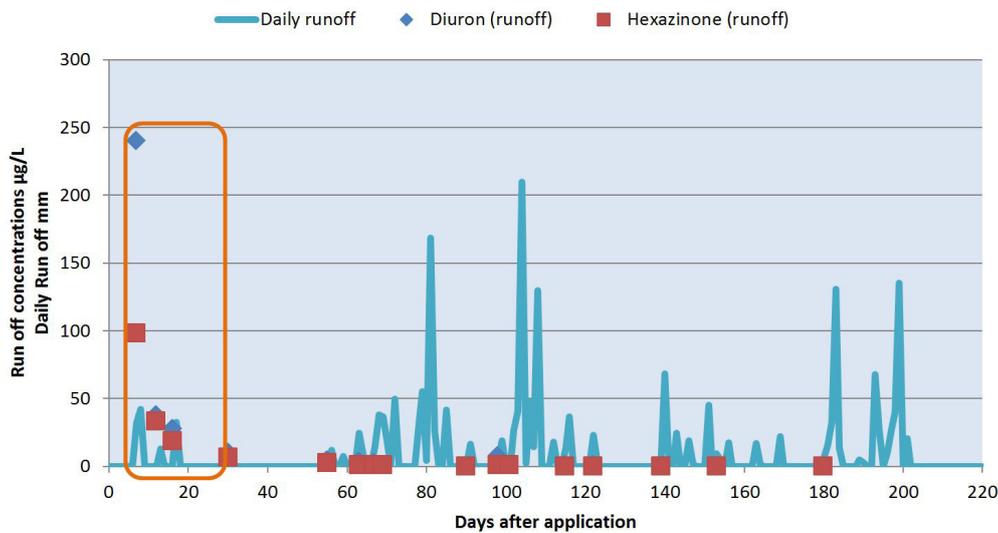


Figure 1 Daily runoff during the 2010/11 wet season, and measured concentrations of herbicides in runoff, black cracking clay soil site. Note the high risk period in the first 20 days.

RECOMMENDATION

Farmers can reduce potential residual herbicide losses by using overhead irrigation after spraying. However, please also follow recommendations on the product label and any associated regulations which may include waiting at least two days after herbicide application on bare soil before watering in, not applying herbicides to water logged soil or delaying application if runoff-causing rainfall is predicted within 48 hours of the planned application.

ABOUT PADDOCK TO REEF

Paddock to Reef uses water quality monitoring and modelling tools across paddock, catchment and marine scales to measure and report on improvements in agricultural runoff entering the Great Barrier Reef catchments.

Monitoring is used to record changes in water quality and to validate the water quality benefits of best practice farming and grazing systems.

Modelling forecasts changes by predicting the level of water quality improvement based on reported levels of best management practice adoption across the Great Barrier Reef region.

Combining monitoring and modelling gives us a robust tool for measuring and predicting change and highlighting and forecasting trends in data. Monitoring data is used to validate and improve the models at each scale, continuously improving the confidence in the estimates of water quality over time.



Measuring a runoff event through a flume set up at one of the Paddock to Reef Water Quality Monitoring Sites. Image by Kaela McDuffie.

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