

FIELD TRIAL

SANDY CREEK PROJECT

1.0 INTRODUCTION

Choosing a residual herbicide for use in ratoon cane can be complicated when considering weed pressure, soil types, no spray windows and buffer zones. The traditional standard diuron + hexazinone mixtures can no longer be used in all situations requiring the use of alternative herbicides.

The objective of this site was to demonstrate the weed control efficacy of two alternative residual herbicide options (to diuron + hexazinone) and to measure herbicide losses in runoff water. One of the herbicide treatments included AmiTron®, which is a relatively new product that promises improved vine control with lower active ingredient application rates.

2.0 METHOD

On 25th September 2019, the trial site was established in the Brightly sub-catchment of Sandy Creek.

Block History: The paddock had been well managed previously and had a low weed pressure as well as a thick green cane trash blanket with the previous crop yielding over 120 t/ha.

Soil Type: Calen soil type – a neutral to alkaline bleached grey-yellow duplex soil.

Application: The residual herbicide treatments were broadcast applied post-harvest, over the trash blanket and incorporated with 40 mm of overhead irrigation within one week of application (30th September 2019).

Sampling: Weed control assessments were conducted for 16 weeks following product application. In-field runoff samples were collected during rainfall and irrigation events using KP composite event samplers.

Treatment Details:

Table 1: Demonstration Treatment Details

Treatment	Product	Product Rate Applied	Product Active Ingredient Concentration	Active Ingredient g/ha applied	Total Active Applied g/ha
1	Barrage®	3.5kg/ha	468g/kg diuron	1638	2,100
			132g/kg hexazinone	462	
2	Amitron® +	800g/ha +	700g/kg amicarbazone	560	672.5
	Balance®	150g/ha	750g/kg isoxaflutole	112.5	
3	Bobcat i-Maxx®	630g/ha	750g/kg hexazinone	472.5	567
			150g/kg imazapic	94.5	
4	Unsprayed Control				

2.1 TRIAL DESIGN

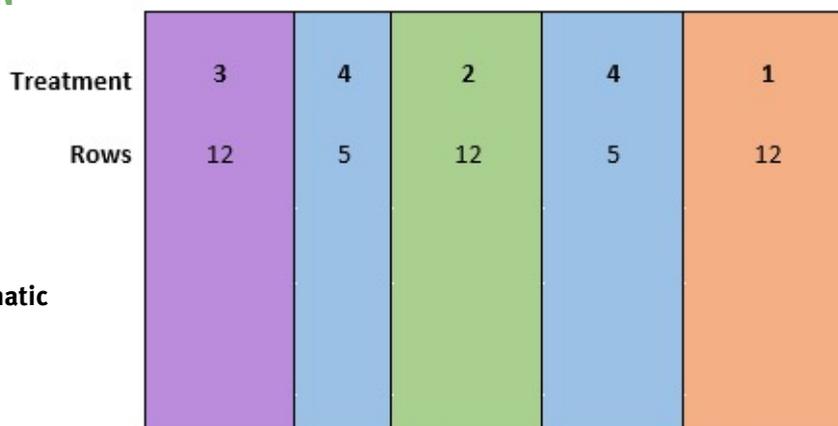


Figure 1: Schematic of trial design

Treatment No	Product Details	Water Rate	Nozzles
1	Barrage 3.5kg/ha	270L/ha	Flood Jet 04 (Blue)
2	Balance 150g/ha + Amitron 800g/ha	270L/ha	Flood Jet 04 (Blue)
3	Bobcat I-Maxx 630g/ha	270L/ha	Flood Jet 04 (Blue)
4	No Spray		

3.0 RESULTS

3.1 WEED CONTROL

The images in Figure 2 below show a comparison of weed control in all four treatments, six weeks after application.



Figure 2: Six weeks after application. Treatments L to R - T1 Barrage, T2 Amitron + Balance, T3 Bobcat i-MAXX and T4 no spray (right) treatments. Image taken on 26/11/2019.

- All products gave commercially acceptable weed control, equal to diuron + hexazinone for 16 weeks post application.
- All treatments provided a high level of weed control with very few weeds present.
- Weeds observed included summer grass, awnless barnyard grass, nutgrass, ipomoea vines and blue top. Weeds occurred evenly throughout herbicide treatments with the 'no spray' treatment hosting slightly larger numbers.
- There was no practical difference in weed control between the herbicide treatments.
- The unsprayed control showed little weed growth, only marginally more than treatments with residual herbicides applied. The unsprayed control could easily have been cleaned up with a late, directed spray of a knockdown herbicide such as paraquat.

3.2 HERBICIDE LOSSES

Six runoff events were collected during the life of the trial. Samples were sent to the Queensland Health Laboratory for analysis of concentrations of a suite of 70 active ingredients. Figure 3 presents herbicide active ingredient concentrations measured in runoff samples and the time after application each sample was collected.

The first sampling event occurred 24 days of trial application. The trial was applied on the 25th of September 2019, five days later, 40mm of overhead irrigation was applied to incorporate the products. On October 19th, 22mm of rainfall fell, triggering a small runoff event which was collected. All subsequent sampling events were triggered by rainfall events.

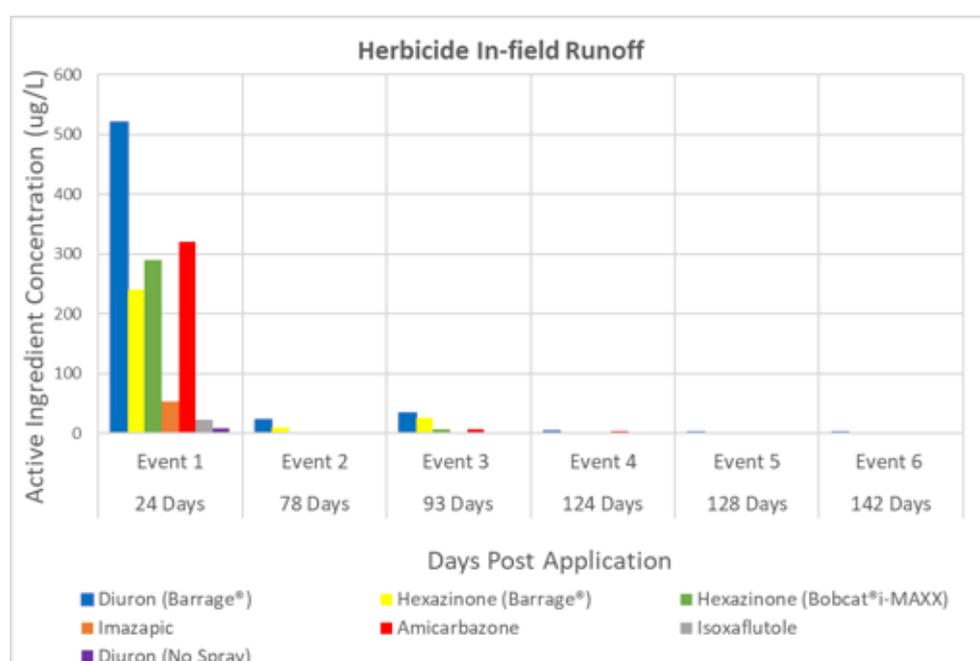


Figure 3: Runoff results from six events. A significant decrease in the concentration can be seen from event 1 to event 2 and a more gradual decrease in concentration can be seen from event 2 to event 6.

4.0 DISCUSSION

- This site demonstrated the diuron + hexazinone alternative treatments, Amitron® + Balance® and Bobcat® i-MAXX gave equally effective weed control for 16 weeks after application.
- At this site, the ‘no spray’ treatments gave acceptable weed control for 16 weeks. This suggests that a thick trash cover is an effective means of weed control, especially in well managed paddocks with low weed pressure (see Figure 4). In these farming situations a simple knockdown herbicide mixture may be all that is required for effective weed control, saving considerable expense.
- Diuron concentrations were the highest of all active ingredients measured in runoff at all sample event times. Diuron was applied at 1638 g/ha, significantly higher than any other active ingredient. Choosing products where lower rates of active ingredient are applied for effective weed control may reduce risk of product losses.
- Runoff results from this site highlight the risk of herbicide active ingredient loss for all products, when runoff occurs soon after application. Management practices that reduce this risk include managing irrigation after residual herbicide application so as not to cause runoff, not applying residual herbicides to wet soil where following rainfall may cause runoff, increasing the time between herbicide application and runoff risk, installing tailwater capture pits to capture first flush events.
- While product choice is always important, the results show that all chemicals may show up in runoff samples. This reinforces the fact that timing of application with proper application methods is critical to reduce the risk of any product leaving the paddock.
- Increasing the time between application and runoff greatly reduces losses. Residual herbicides should not be applied to wet soil and irrigating to runoff for incorporation should be avoided. Avoid application of preemergent herbicide where rain that is likely to cause runoff is forecast.
- Investing in clean fallows and protecting plant cane can reduced the need for excessive herbicide applications in ratoons.

5.0 CONCLUSION

This demonstration has shown that there are a number of effective, alternative herbicides to diuron that provide equal weed control to 16 weeks after application. The alternative products tested at this site also apply around 70% less active ingredient than diuron products and had lower concentrations of active ingredient measured in runoff water at the six events sampled.



Figure 4: Trial treatments were applied to a thick cane trash blanket from the previously harvested cane

The Sandy Creek project has been funded by the Queensland Government’s Reef Water Quality Program since 2015 after a group of growers sought assistance from the government to identify and better understand pesticide losses from their farms. Since 2018 there has been an increased focus on the Brightly sub catchment within Sandy Creek catchment because of its defined catchment and small number of growers.



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ABOUT THE PROJECT

The Sandy Creek Project will:

- ▶ monitor sub-catchment water quality
- ▶ conduct paddock scale run-off trials
- ▶ direct extension activities to growers across the Sandy Creek sub catchment to improve chemical management practices
- ▶ provide a chemical management plan and targeted one-on-one agronomic services to all engaged growers in the Brightly south branch sub-catchment
- ▶ utilise grower led sub-catchment groups to promote WQ results and improved practices
- ▶ communicate the project, the outcomes and lessons learned to the broader Sandy Creek landholders
- ▶ apply strategies to overcome barriers to management practice change.