

Project Catalyst Final Report

Grower Information

Grower Name:	Wilmar
Entity Name:	Haughton Sugar
Trial Farm No/Name:	Block 70 plant
Mill Area:	Invicta, Pioneer, Kalamia
Total Farm Area ha:	3500
No. Years Farming:	12
Trial Subdistrict:	Upper Haughton
Area under Cane ha:	3500

Background Information

Aim:

Establish the optimum time to reapply irrigation water following a Metribuzin application

Background: (Rationale for why this might work)

Metribuzin is being widely used in the Burdekin as a replacement to Diuron in Gramoxone mixtures for post emergent weed control. It is particularly effective on controlling larger grass weeds including wild sorghum (*sorghum arundinaceum*) up to the 4 leaf stage.

Metribuzin was originally introduced to the Sugar Industry by Bayer in 2009 and marketed as Soccer (750g/kg Metribuzin). This product had a stipulation of a 48hr delay for irrigation post treatment. Bayer have discontinued manufacture of Soccer.

ADAMA have recently introduced their Metribuzin product called Mentor (750g/kg Metribuzin). However, this product has no irrigation delay recommendation. In a fully irrigated situation such as the Burdekin, growers need to know the correct time to re-introduce irrigation water to ensure efficacy of the product and to minimise off site impacts.

Potential Water Quality Benefit:

Improved efficacy of Metribuzin on harder to kill grass weeds and reduced levels of Metribuzin leaving farms.

Expected Outcome of Trial:

Improved recommendations for post application irrigation strategies, thereby reducing the chances of Metribuzin leaving farms in irrigation tailwater and entering natural watercourses.

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Where did this idea come from:

Monitoring of Barratta Ck at the Northcote gauging Station has shown Metribuzin among a range of chemicals being detected. Subsequent monitoring under the jurisdiction of the Barratta Ck Action Groups' Stage 1 project, showed Metribuzin levels of 6 and 24ug/l in runoff water during July and August 2016. The lack of a recommendation for irrigation delay post treatment in the ADAMA label, meant growers were unsure of their obligations for product use and also the best way to improve water quality if Metribuzin needed to be used.

Plan - Project Activities	Date : (mth/year to be undertaken)	Activities :(breakdown of each activity for each stage)
Stage 1	27/10/16	Apply herbicides to cane just prior to the 2 nd irrigation post hillup of the plant cane.
Stage 2	28/10/16	Instal Kp sampler
Stage 3	29/10/16	Begin irrigation on set 1
Stage 4	30/10/16	Collect sample from set 1; continue collection as the irrigation moves across to sets 2-5 respectively.
Stage 5	3/11/16	Final sample taken from set 5 and Kp samplers removed.
Stage 6	10/11/16	Samples delivered to BBIFMAC for consignment to Qld Health for analysis.

Project Trial site details

Trial Crop:	Sugarcane
Variety: Rat/Plt:	Plant Q240
Trial Block No/Name:	70-2
Trial Block Size Ha:	40ha
Trial Block Position (GPS):	
Soil Type:	Cracking clay/Vertisol

Block History, Trial Design:

Block 70-2 was sprayed on 27th October 2016 and irrigation commenced 2 days after treatment (DAT). The irrigation supply was from the SunWater channel and the pump delivered 10ML/day. The irrigation sets were in 50 row configurations or around 8.2ha units each. Irrigation runoff was collected using a KP event sampler designed by BBIFMAC staff.

Set 1 50 rows Sampled 30/10/16 2-3DAT	Set 2 50 rows Sampled 31/10/16 3-4DAT	Set 3 50 rows Sampled 1/11/16 4-5DAT	Set 4 50 rows Sampled 2/11/16 5-6DAT	Set 5 50 rows Sampled 3/11/16 6-7DAT
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Figure 1: Irrigation regime for the respective sampling dates



Photo 1: Kp sampler in action

Treatments:

The following spray mixture was applied to the plant cane on 27th October 2016, 2 days before the commencement of the 2nd irrigation following hillup.

Soccer (Metribuzin) @ 0.5 kg/ha
 Agritone (MCPA) @ 0.3 l/ha
 Gramoxone @ 1.0 l/ha

Results:

Table 1: Sampling dates and respective herbicide concentrations (µg/l)

Date	30/10/16	31/10/16	1/11/16	2/11/16	3/11/16
Metribuzin (µg/l)	66	73	24	37	26
Diuron (µg/l)	0.44	0.56	0.85	0.6	0.38
Metolachlor (µg/l)	2.7	3.2	3.1	3.9	2.3
Atrazine (µg/l)	0.48	0.58	0.33	0.39	0.45

The Metolachlor concentrations reflect the herbicide application on the 27th October 2016.

The aim of the trial was to show the preferred delay in application post application of the Metribuzin. Given that 10ML was applied to the 8.2 ha section of the block which comprised 50 furrows, it can be assumed with a runoff characteristic of 20% of the applied volume, then the total volume of runoff water per furrow was 40,000l .

If using the initial day of detection as the example, then 40,000l X 66 µg/l of Metribuzin left the field. This equates to 2.6g per furrow or 15.6g/ha or 3% of the total Metribuzin applied.

However, delaying irrigation for 4 days rather than 2 days halved the runoff concentrations of Metribuzin.

Furthermore, the concentrations of Diuron, Metolachlor and Atrazine shown in Table 1 are from herbicide applications prior to 27th October 2016. The Diuron was from the initial spray application on the 21st May 2016 (0.5 kgDiuron/ha applied with a Gramoxone mixture after the first irrigation), whilst the Atrazine (1.5kg/ha) and Metolachlor detections (1.8 l/ha Dual Gold) shown in Table 1 are from the residual application applied on the 7th July 2016, just prior to a rainfall event of 20mm. This rainfall event was sufficient to activate the residual chemicals without any recording of runoff.

Conclusions and comments

It certainly appears that delaying irrigation for longer than 2 days after application of the Metribuzin will reduce the amount of the chemical leaving the field. Waiting for 4 days versus 2 days after treatment halved the quantity of Metribuzin in the irrigation runoff water.

It also seems that delaying the introduction of irrigation post application is likely to improve the efficacy of the Metribuzin on harder to kill grass weeds, such as tillering summer grass and wild sorghum (up to 4 leaf stage).

This trial has been repeated on a heavy cracking clay soil in September 2017. Results should be available in early October 2017.

Advantages of this Practice Change:

Delaying irrigation after applying Metribuzin, certainly seems to have a water quality benefit as well as it is likely to improve product efficacy on harder to kill grass weeds.

Disadvantages of this Practice Change:

There are no disadvantages to delaying irrigation although at peak irrigation times this may be impractical and parts of the paddock may have to irrigated after 2 DAT but before the 4DAT.

Will you be using this practice in the future:

This practice has been recommended to all Burdekin growers who attended the Feb/Mar 2017 round of shed meetings (about 40% of all growers). Growers will be encouraged to use the delay if it is appropriate to wait the extra 2 days to begin irrigation.

% of farm you would be confident to use this practice:

This practice will be recommended for any farms where products such as Metribuzin and Diuron are being used.