

Project Catalyst Trial Report

Stool Spilt v Side Dress and Water Quality Outcomes

Grower Information

Grower Name:	Russell Jordan
Entity Name:	JORDAN FARMING (QLD) PTY LTD
Trial Farm No/Name:	BKN-00430A
Mill Area:	Burdekin - Invicta
Total Farm Area ha:	120ha (has two other farms not included)
No. Years Farming:	20+
Trial Subdistrict:	Upper Haughton
Area under Cane ha:	120ha (has two other farms not included)

Status: Completed

Background Information

Aim: To investigate and compare granular subsurface applied fertiliser using the methods and timings of stool spilt (directly after harvest), stool spilt (after 1st watering) and side dress (after 1st watering) and determine productivity and water quality outcomes.

Background: (Rationale for why this might work)

Since the late 1990s, stool splitting fertiliser has become the standard practice on the heavier soils of the BRIA. To date, there is limited water quality data comparing stool spilt v side dress especially in the lighter soils of the BRIA. The timing of stool splitting will also be investigated if there is any effect in applying directly after harvest as some growers deemed this more time efficient.

Potential Water Quality Benefit:

Water quality results will benefit decision making of application method and timing in the future.

Expected Outcome of Trial:

The fertiliser form and application method that will deliver the better water quality outcome is unclear.

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Where did this idea come from: The grower (Russell Jordan)

Plan - Project Activities	Date : (mth/year to be undertaken)	Activities :(breakdown of each activity for each stage)
Stage 1	June – Sep 2019	<ul style="list-style-type: none"> - Block selection - Design trial
Stage 2	Oct 2019	<ul style="list-style-type: none"> - Implement trial and install water quality monitoring equipment
Stage 3	Oct 2019 – Mar 2020	<ul style="list-style-type: none"> - Collect water samples from irrigations and rainfall events - Monitor treatments for any visual differences.
Stage 4	Mar 2020 – June 2020	<ul style="list-style-type: none"> - Compile and analyse water quality data
Stage 5	Jun 2020 – Dec 2020	<ul style="list-style-type: none"> - Harvest trial - Analyse data

Project Trial site details

Trial Crop:	Sugarcane
Variety: Rat/Plt:	3R Q208
Trial Block No/Name:	BKN-00411A-02-02
Trial Block Size Ha:	29.57ha
Trial Block Position (GPS):	-19.662652° 147.145242°
Soil Type:	Light clay – predominately 6Dbc

Block History, Trial Design:

Trial Implementation:

- Three treatments of three replications (minimum) as a randomised field strip trial.
- The directly after harvest treatment was applied on the 4th October 2019, with the two after 1st watering treatments being applied 15 days later (19th October 2019).
- Six KP automatic water event samplers were installed on 4th October 2019, accounting for two replications of each treatment.
- Six irrigation and 2-6 rainfall events (weather permitting) will be collected.

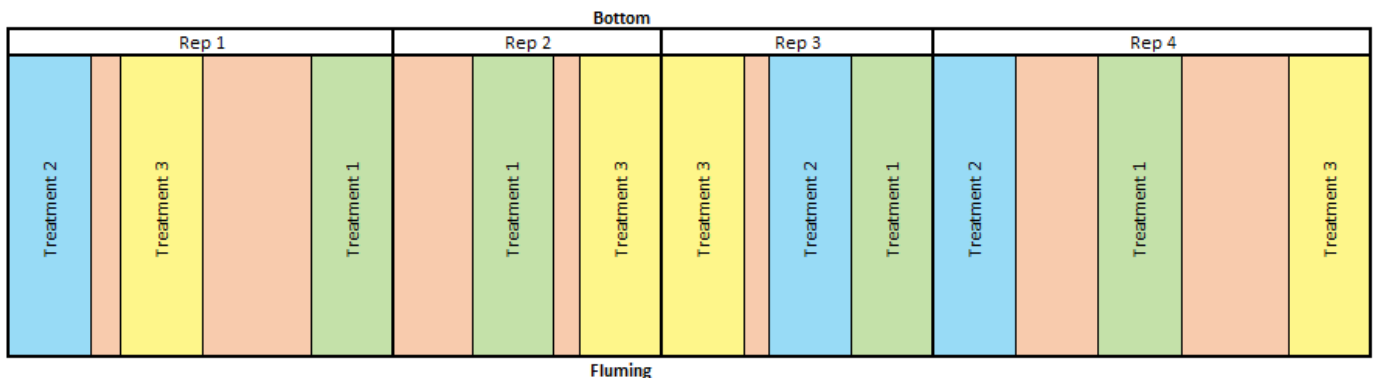
Treatments:

All treatments target nutrient: 200N 0P

Trial Treatments:

Treatment	Applicator	Timing	Date Applied
T1	Stool Spilt	Directly after harvest	04/10/2019
T2	Stool Spilt	After first irrigation	19/10/2019
T3	Side Dress	After first irrigation	19/09/2019

Trial layout:



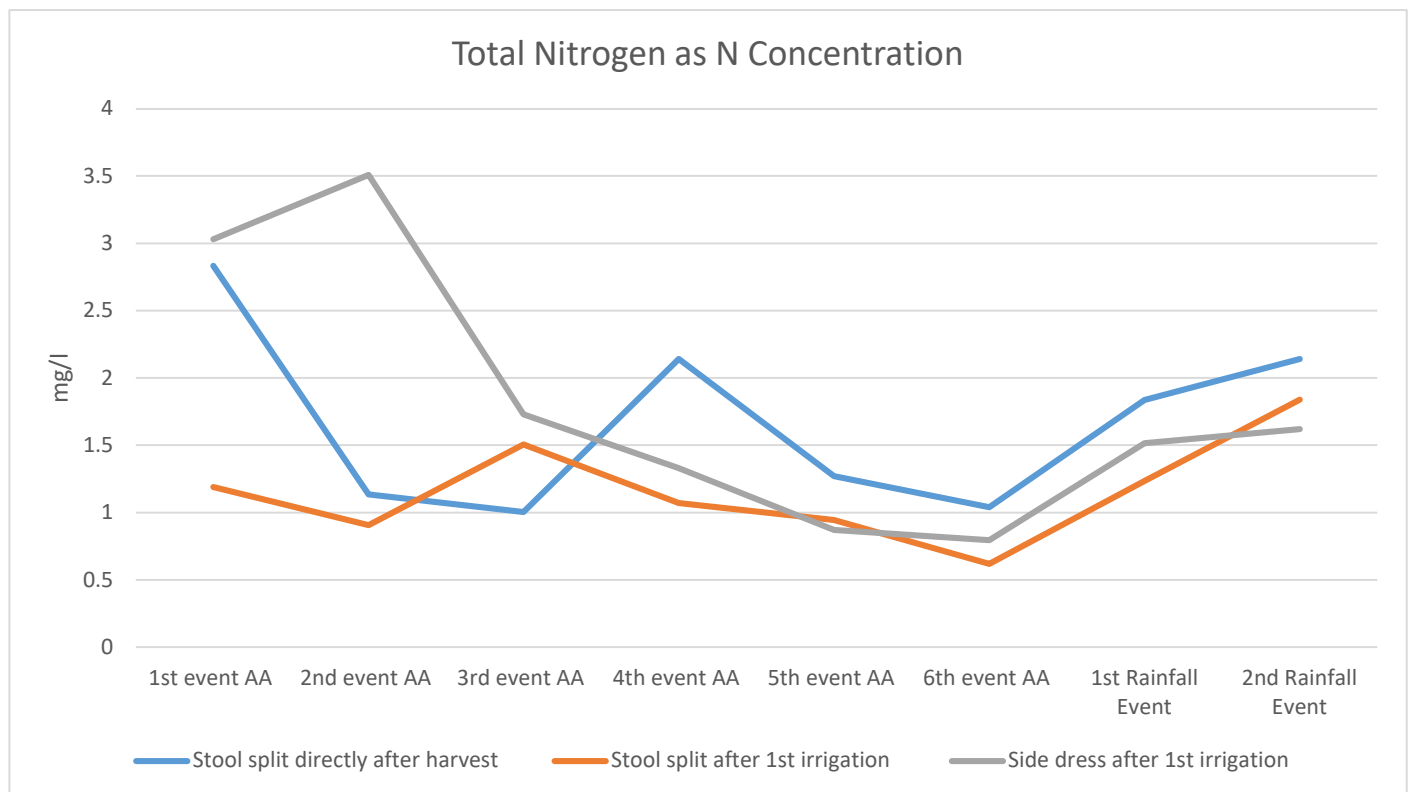
Results:

Water Quality:

See below rainfall/irrigation events that have been captured using KP samplers. Individual samples are collected and analysed from two replicates of each treatment. Total nitrogen as N was analysed including ammonium nitrogen, oxidised nitrogen and total Kjeldahl. Water quality sampling was undertaken by BBIFMAC.

Event	Date
1 st Irrigation	08/10/2019
2 nd Irrigation	31/10/2019 to 01/11/2019
3 rd Irrigation	20/11/2019 to 21/11/2019
4 th Irrigation	09/12/2019
5 th Irrigation	19/12/2019
6 th Irrigation	31/12/2019
7 th Irrigation	9/01/2020
1 st Rainfall	17/01/2020 to 18/01/2020
2 nd Rainfall	26/01/2020

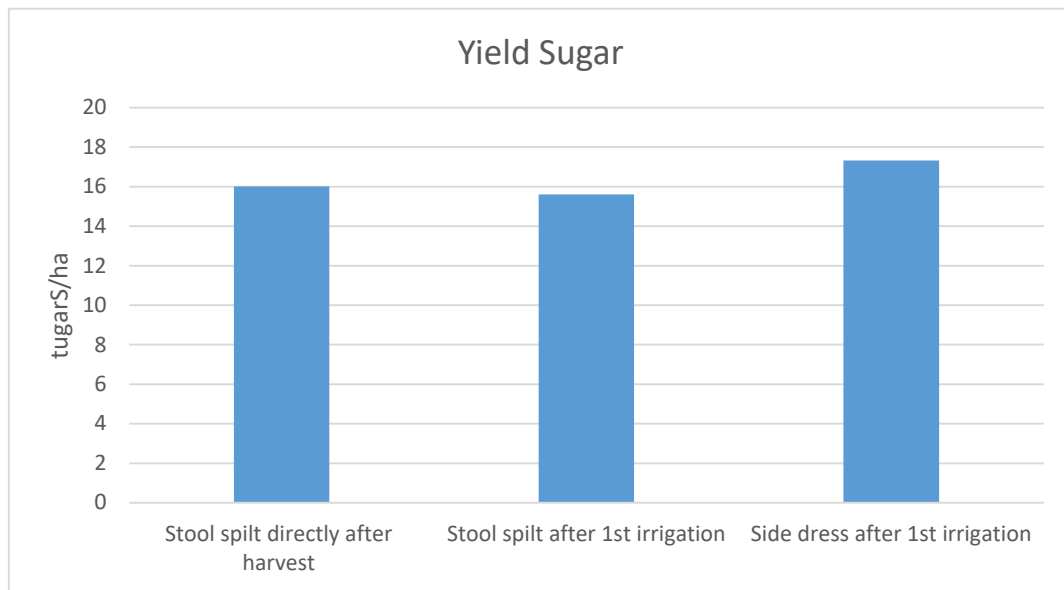
To enable comparison between the treatments that were applied either before or after the first irrigation, water quality results were compared based on 'x event' after the application of fertiliser. The highest spike in total N concentration was recorded by the side dress after first irrigation. Following this all treatments followed a similar trend, including during rainfall events. Further investigation is required as stool spilt directly after harvest spikes at the first and fourth event.



*AA – After Application of fertiliser

Yield:

This trial was harvested on 5th-6th September 2020. When results were analysed at 90% confidence, side dress after 1st irrigation significantly outperformed both stool-spilt treatments regardless of fertiliser type in terms of cane yield and sugar yield. There was no significant difference in CCS at P=0.1. There was no observed yield difference between the stool spilt treatments regardless of timing. It must be noted that the side dress treatment average was increased by two replications that yield 133 and 132t/ha, the difference was also observed in the harvested yield monitor. Further investigation into these two plots was inconclusive and the entire trial was managed and irrigation at same.



Treatment	Treatment Description	Cane Yield (tC/ha)	CCS	tSugar/ha
T1	Stool spilt directly after harvest	117.86 b	13.60 -	16.01 b
T2	Stool spilt after 1 st irrigation	116.96 b	13.33 -	15.60 b
T3	Side dress after 1 st irrigation	126.15 a	13.74 -	17.32 a

LSD P=0.1

Conclusions and comments

At this trial site, the side dress after 1st watering outperformed both stool-spilt treatments. There was no significant difference between both stool spilt treatments regardless of application timing (directly after harvest v after first watering)

Advantages of this Practice Change (moving to side dress application):

- Increased cane and sugar yield
- At this trail site, there was very little difference in water quality results and run off N concentration was similar, if not less than what was applied as part of the irrigation water.

Disadvantages of this Practice Change:

Potential labour increase using a side-dress applicator.

Will you be using this practice in the future:

This grower has moved to side dressing and already observed the yield benefits, but wanted to do a fully replicated trial to confirm.

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

100% of ratoons are now fertilised via side-dress with recently attached stool zippers.