

Disclaimer:

This document is based on the results from an individual trial and may contain experimental use patterns that are currently off-label. **This document does not provide any interpretation and should not be taken as an endorsement of any unregistered use pattern.**

Professional advice should be sought for specific recommendations to ensure access to the most up to date information and knowledge.

Any product referred to in this document must be used strictly as directed, and in accordance with all label or permit instructions. Always consult the label prior to use.

Nitrogen Management in Sorghum

Trial ID: **BB1801** Location: **Jondaryan** Trial Year: **2018**
 Investigator: **Brendan Burton**

Objectives:	1. To compare the crop NUE of anhydrous ammonia vs urea based on equivalent rate, timing and depth. 2. To investigate the potential volatilisation losses of urea when spread on the soil surface. 3. To assess the rate of movement of nitrate N through the soil profile.			
Situation:	Sorghum MR Bazley			
Application Code:	A	B	C	D
Application Date:	4/04/2018	4/04/2018	4/04/2018	31/10/218
Application Method:	Drilled with single disc to 7.5cm depth on 50cm bands	Drilled with double disc to 7.5cm depth on 50cm bands	Spread on soil surface, no incorporation	Spread on soil surface, no incorporation
Application Timing:	~ 6 months pre-plant	~ 6 months pre-plant	~ 6 months pre-plant (~17mm rain within 2 weeks of application)	PSPE (~30mm rain within 2 weeks of application)
Background N level:	April 2018 - 149 kg N/ha (0-120cm)			
Planting Date:	30/10/2018			
Planting Equipment:	Commercial Tyne Planter			
Planting Rate:	2.8 kg/ha			
Planting Depth:	5cm			
Row Spacing:	1m			
Harvest Date:	20/02/2019			
Keywords:	Nitrogen, sorghum			

This trial was designed to evaluate NUE from anhydrous application compared to urea application at the same depth or when surface applied. In addition it hoped to generate more data on surface application potential and the movement on nitrogen in the profile from different application depths. Initial plan was to evaluate responses in wheat 2018. However a lack of planting moisture delayed the trial with sorghum planted nearly 7 months after initial applications.

Crop performance was the primary focus for Objective 1 as soil tests conducted on banded applications are inherently inaccurate. Soil test were only used in the Untreated and plots where urea was spread on the soil surface. A nitrogen rate of 66 kg N/ha was applied for all N treatments.

Situation Description				Fallow	Sorghum	Sorghum	Sorghum	Sorghum
Assessment Date				0-30cm depth 16/11/2018	16/11/2018	20/12/2018	20/01/2019	20/02/2019
Assessment Type				SOIL N	EMERGENCE	NDVI	COUNT	YIELD
Assessment Unit				kg N/ha	/m ²	Ratio	Heads/m ²	t/ha
Plant-Evaluation Interval				17 DP1	17 DP1	51 DP1	82 DP1	113 DP1
Trt No.	Treatment	Product Rate	Appln. Code					
1	Untreated	-	-	66.6-	7.4-	0.79-	10.6-	4.63-
2	BIG N	80kg/ha	A			0.81-	11.1-	4.50-
3	Urea	143kg/ha	B		7.2-	0.81-	10.5-	4.56-
4	Urea	143kg/ha	C	77.3-	7.7-	0.79-	9.6-	4.57-
5	Urea	143kg/ha	D		6.9-	0.81-	11.1-	4.38-
LSD P=.05 Treatment Prob.(F)=				nsd 0.1253	nsd 0.4855	nsd 0.5196	nsd 0.5227	nsd 0.9566

Yield cv = 10.4%

Means followed by same letter do not significantly differ (P=.05, LSD)

Mean comparisons performed only when AOV Treatment P (F) is significant at mean comparison OSL.

nsd = No Significant Difference

Nitrogen Management in Sorghum

Trial ID: BB1801

Location:

Jondaryan

Trial Year:

2018

Situation Description				Fallow 0-90cm 21/02/2019	Sorghum 21/02/2019	Sorghum 22/02/2019	Sorghum 22/02/2019	Sorghum 22/02/2019
Assessment Date				21/02/2019	21/02/2019	22/02/2019	22/02/2019	22/02/2019
Assessment Type				SOIL N	DRY MATTER	PROTEIN	SCREENING	N RECOVERY
Assessment Unit				kg N/ha	t/ha	%	%	kg N/ha
ARM Action Codes							AL	
Trt No.	Treatment	Product Rate	Appln. Code					
1	Untreated	-	-	52-	4.8-	9.1-	12.0-	67-
2	BIG N	80kg/ha	A		4.9-	9.2-	12.8-	66-
3	Urea	143kg/ha	B		4.6-	9.5-	14.2-	69-
4	Urea	143kg/ha	C	84-	4.8-	9.2-	9.0-	68-
5	Urea	143kg/ha	D	66-	4.4-	9.5-	14.2-	67-
LSD P=.05 Treatment Prob.(F)=				nsd 0.4156	nsd 0.8837	nsd 0.2496	nsd 0.2356	nsd 0.9817

Assessment Type

NDVI = Normalized difference vegetation index

N RECOVERY = Nitrogen recovery in grain

ARM Action Codes

AL = Automatic log transformation of X+1

DP1 = Days after Planting

Comments:

The Untreated soil N level was more than adequate to satisfy the N requirement of a 4.5 t/ha sorghum crop with no N response from any treatment. No data was generated to compare the NUE of the different N treatments.

Previous trials have highlighted the difficulty in discriminating soil N levels where application rates of N have been <100kg N/ha. The grower practice (66kg N/ha) was marginal, at best, for accurately determining N carryover using soil testing.

Based on the degree of variability, lack of nitrogen response, and difficulty in discriminating any real differences between treatments we were unable to conclude whether nitrogen was lost due to volatilisation when urea was spread on the soil surface.