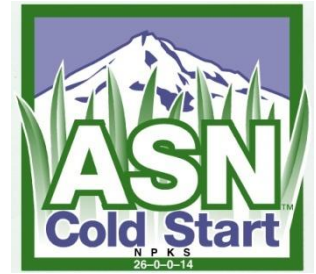




How does ASN Cold Start™ work??

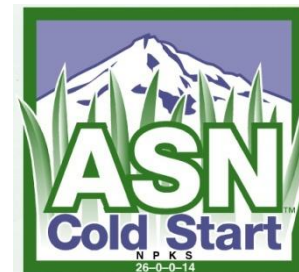
- Plants absorb most of their N requirements in the Nitrate form, but many fertilisers contain their N *only* in the Ammonium form ie., Ammo, Urea, Ammonium Sulphate, DAP, MAP. (Ammo is a blend of Urea + Amsulf)
- To supply winter pasture with readily available Nitrate N, the Ammonium N typically undergoes conversion by soil bacteria in a process known as *nitrification*.

Winter Woes



- **The Nitrification process is dramatically slowed when:**
- **Soil temperatures fall below 6°C**
- **Excess soil moisture – high rainfall**
- **Poor soil aeration – low oxygen levels**
- **Low soil pH < 5.8**

Soil Temperature Influence



% nitrification of fertiliser $\text{NH}_4 \rightarrow \text{NO}_3$ time in weeks

Soil temperature

	2 w	4 w	8 w
5 °C	6	12	25
10 °C	14	27	55
15 °C*	51	100	100
20 °C	100	100	100



Long term mean monthly soil temperature in °C at 10cm depth

Location	April	May	June	July	August	Sept	Oct
Molesworth	7.2	3.4	0.8	-0.1	1	3.6	7.6
Lincoln	10.1	7.5	4.6	3.9	5.1	7.5	10.7
Winchmore	10.1	6.4	3.6	2.8	3.9	6.7	10.2
Adair	10.3	6.9	4	3.2	4.4	7.1	10.4
Palmerston	9.4	6	3.1	2.9	4	6.4	9.3
Gore	9.5	6.2	3.4	3.3	3.6	6.1	8.1
Winton	9.2	6.3	3.6	3.1	4.1	6.2	8.6

(NZ Met Service)



Winter pasture response vs. Nitrogen form

- **Immediate**

**Fast acting Nitrate – N + slower acting
Ammonium – N fertilisers**

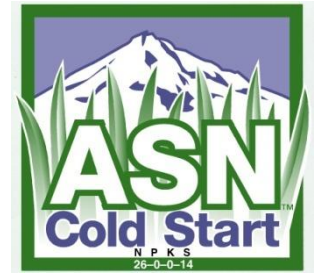
(ASN Cold Start™)

- **Delayed**

**Slower acting Ammonium only
fertilisers**

**(Urea, Ammonium Sulphate, Ammo
DAP, MAP)**

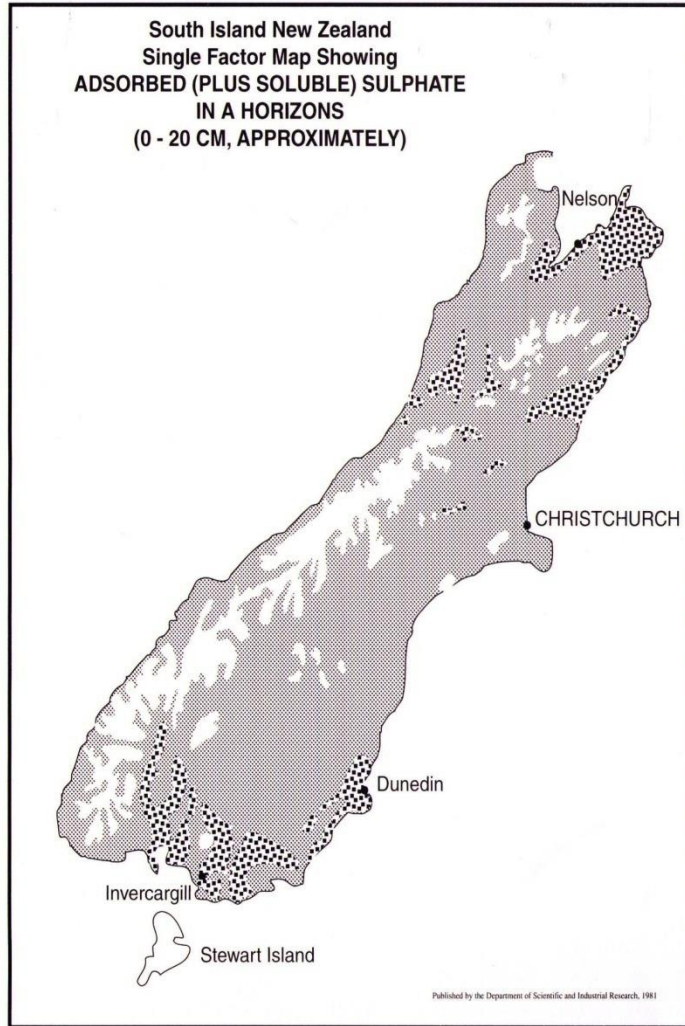
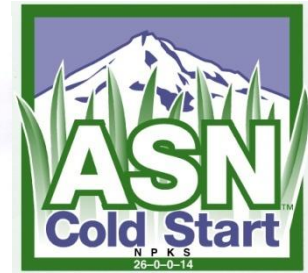
The Value of Sulphur




- **Temporary Sulphur deficiencies are often observed in winter because:**
 - low soil temperatures- lack of mineralisation
 - High rainfall and leaching


ASN Cold Start™ combines readily available Sulphate S with Nitrogen for maximum pasture growth

New Zealand Sulphur Levels - SI

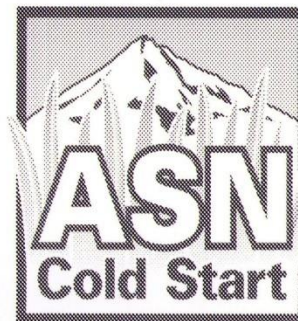


Key

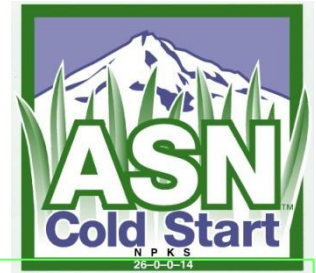
 0 - 20: Areas most likely to be responsive to ASN Cold Start Sulphate Sulphur for winter pasture production.

 20 - 50: Areas possibly responsive to ASN Sulphate Sulphur for winter pasture production.

Adsorbed (plus Soluble) Sulphate in A horizons (0 - 20cm, approximately) (parts per million on oven-dry weight)

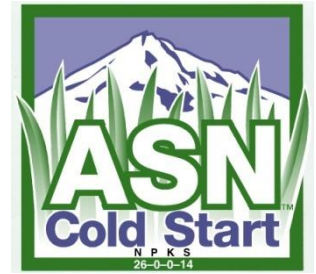


ASN Cold Start™



- **26% Nitrogen**
 - 7% NO₃ Nitrate – N
 - 19% NH₄ Ammonium – N
- **13 % Sulphur as Sulphate – S**
- **39% Total nutrient content**
- **Consistent particle size for even spread out to 42 meters reduces the number of passes**
- **Granular homogeneous complex dust free fertiliser**
- **(Ammono N is a physical blend of Amsulf and Urea !!)**

When it comes to Nitrogen....



$$1 + 1 = 3$$

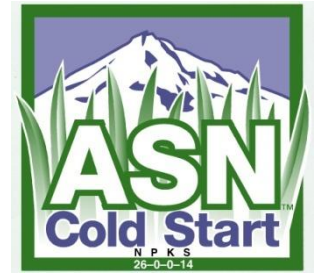
- **The presence of both forms of Nitrogen (Ammonium & Nitrate) in a fertiliser provides for a superior winter pasture response**

Sulphur in the presence of Nitrogen....



- **Sulphur is critical for Chlorophyll formation (therefore photosynthesis)**
- **Sulphur deficient plants can be 40% lower in Chlorophyll**
- **S Deficiency also leads to accumulation of non protein N in the form of Nitrates and Amide in plants as they cannot adequately process these in the absence of S**
- **Adequate S is critical to reduce nitrate levels in forage feeds**

Reduce N inputs with Sulphur

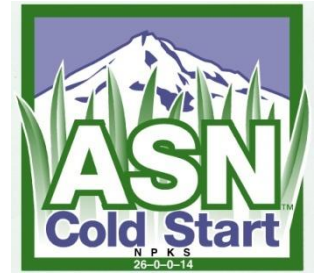


- **Research has shown N inputs can be reduced by up to 20% without loss of production in the presence of adequate Sulphur**
- **ASN provides S as readily available Sulphate which ensures efficient N utilisation**
- **The combined package of Nitrate, Ammonium , and Sulphate Sulphur provides superior performance to alternative fertilisers especially in cool conditions**

Year round activity



- **ASN does not volatilise therefore can be spread whenever it suits without fear of gaseous losses.**
- **Dew is sufficient to breakdown the granules.**
- **ASN is fast acting needing only adequate water to dissolve and wash in**
- **No lag period, immediately effective once in soil solution.**



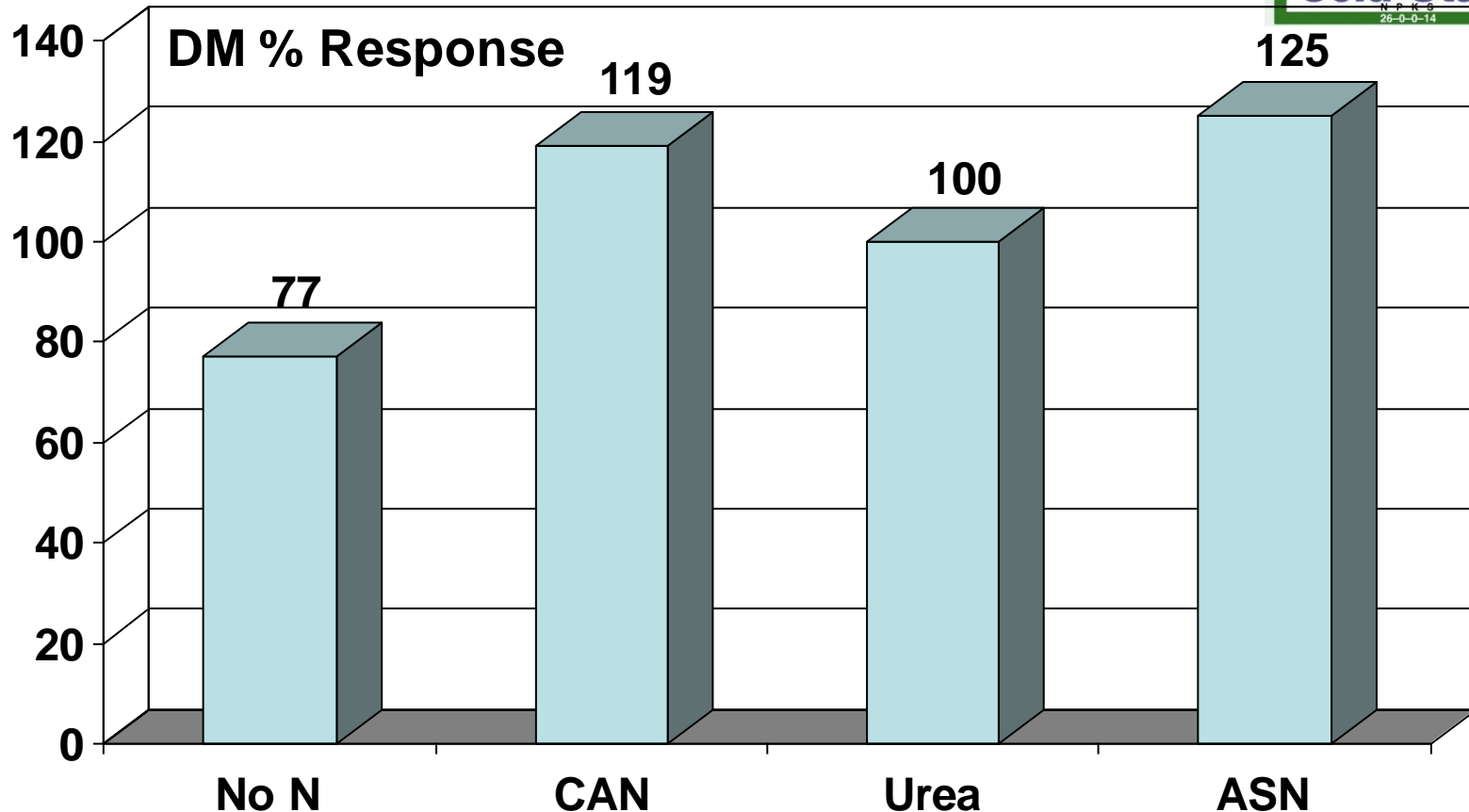
Does ASN Cold Start™ work?

AgResearch trials in 1995 confirmed that:

- **ASN produced significantly more pasture dry matter than other N forms**
- **The positive responses were maintained through to the final cut (57-77 days after application)**
- **“...it would be fair to conclude that ASN has a significant advantage over Urea...at mean soil temperatures below 6°C” Dr AHC Roberts**



AgResearch 1st cut Reporoa



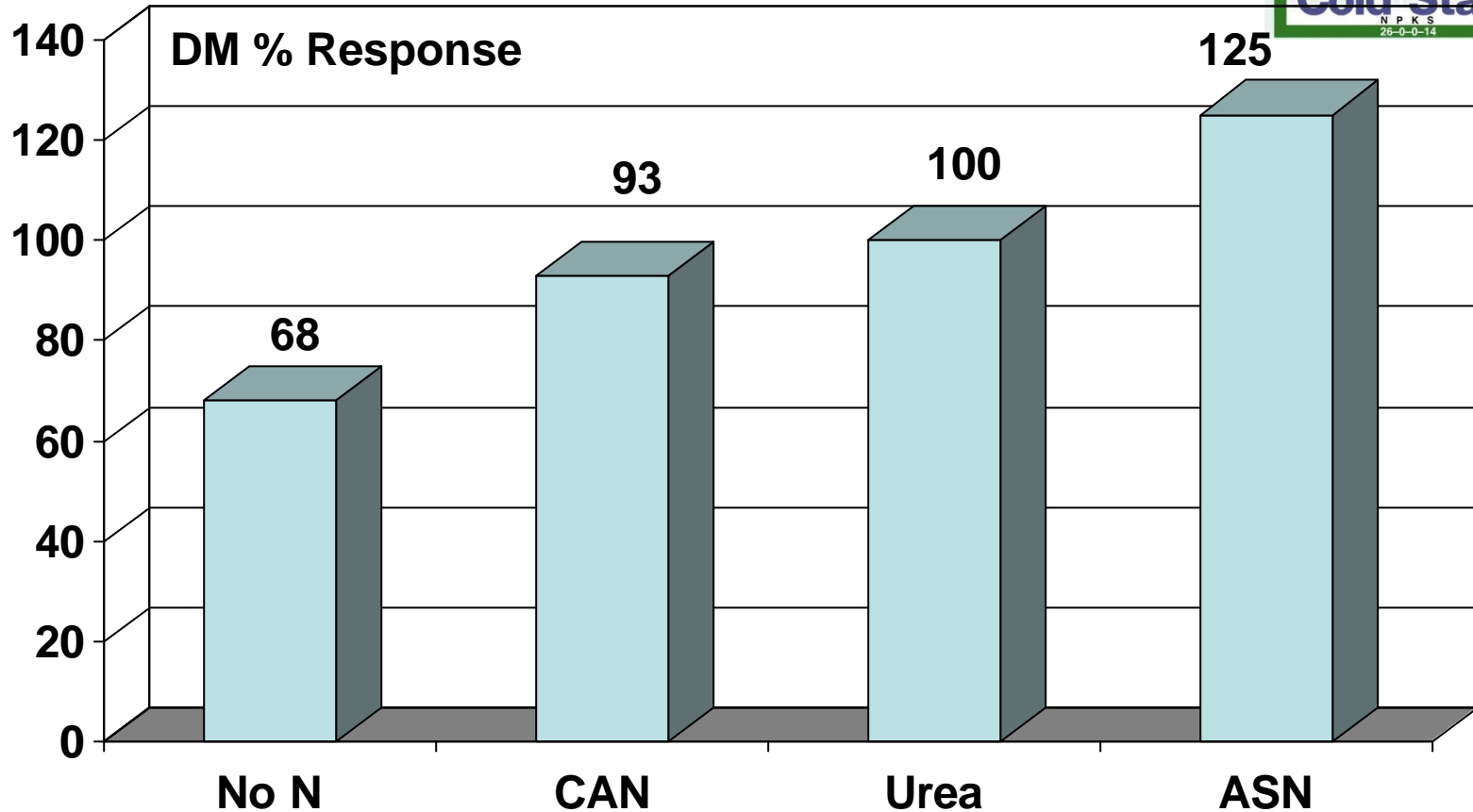
Pasture DM production response to Nitrogen

Fertiliser treatments relative to Urea as 100% response

Fertilisers

Agri

AgResearch 1st cut Waituna

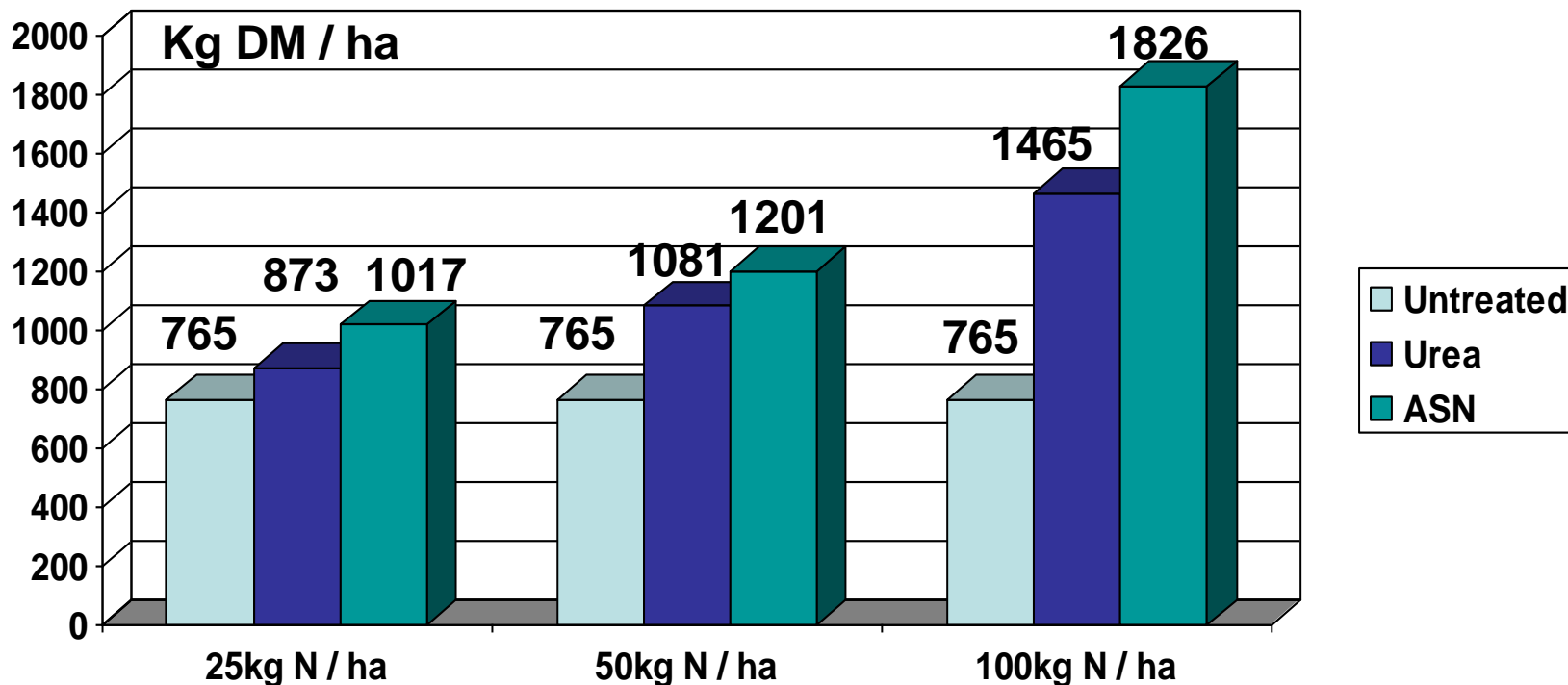
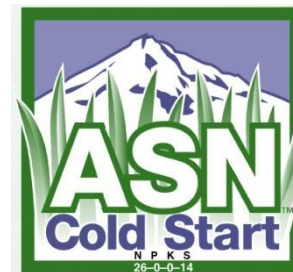


Pasture DM production response to Nitrogen
Fertiliser treatments relative to Urea as 100% response

Fertilisers

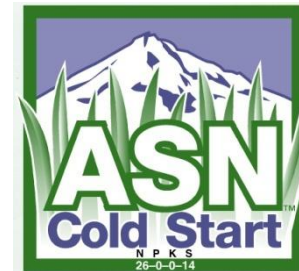
Agri

Ravensdown Trial South Canterbury 1994



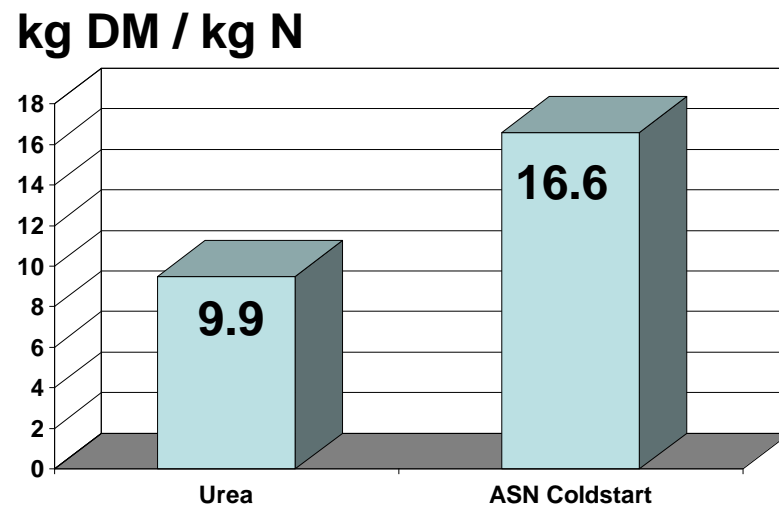
Pasture production (kg DM/ha) comparing Urea and ASN from 3rd week in August (soil temp 3.5 - 5.5°C) to end September

The Economics of ASN ColdStart™

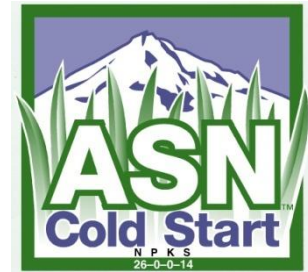


- In 15 trials throughout NZ, ASN ColdStart improved N responses over urea by an average of 75% *
- **Dr Jamie Blennerhasset Summit Quinphos Ltd*
- Applying ASN at 50kg N/ha based on the above findings, would yield a net return of \$191.01 /ha
- * Assumes a dairy payout of \$6.00/ kg MS

ASN advantage over Urea



Cost Benefit Analysis



Based on ex Ashburton prices

<u>Costs</u>	Urea		ASN
Product cost per tonne	\$ 641.00		\$ 655.00
Bulk Cartage			
Bulk Spreading	\$ 12.00		\$ 12.00
Spreading Rate Kg /Ha	109		193
% N in product	46%		26%
N Applied per Ha	50.14		50.18
Cost per Ha	\$ 71.18		\$ 128.73
<u>Dry Matter Result</u>			
Response Kg DM per Kg N	9.9		16.6
Extra total Kg DM per Ha	496.386		833
Utilisation	80%		80%
<u>Returns</u>			
Kg DM per Kg MS	6.5		6.5
Payout Kg MS	\$ 6.00		\$ 6.00
Gross Return per Ha	\$ 366.56		\$ 615.13
Net Return per Ha	\$ 295.38	\$ 191.01	\$ 486.40



Fertilisers

Agri