

TWINN CROP TRIAL



Wheat: Bellata, NSW, 2009

An independent replicated wheat trial was conducted at Bellata, NSW, to measure the effects of TwinN on yield and protein levels when combined with different applications of nitrogen fertilisers.

KEY RESULT

- ♦ The trial showed that a single application of TwinN delivered an additional 4.5% (110 kg/ha) yield with a 60 kg (50%) reduction in applied Nitrogen. Comparison of 60 kgN/ha, with and without TwinN, showed a yield increase of 230 kg/ha, or 10%, when TwinN was applied.

TRIAL RESULTS

TABLE 1: Effect of TwinN and Nitrogen Fertiliser on Yield and Protein Levels

TwinN Placement	Fertiliser (Kg N/ha)	Yield, Dry (t/ha)	Yield, Watered ¹ (t/ha)	Protein, Watered (%)
Nil	Nil	1.97	2.22	12.0
Nil	60	1.88	2.31	12.1
Direct Inject	60	2.10	2.54	11.9
Foliar	60	2.02	2.51	11.7
Nil	120	2.01	2.43	11.8

¹Watering was supplied once to provide 22mm rain equivalent because the trial crop was entering serious water stress.

In the 60 kgN treatment, addition of TwinN increased yields by 10% (direct inject) and 8.7% (foliar). The 60 KgN plus TwinN treatments, both direct inject and by foliar application, showed slightly higher yields than the highest N treatment of 120 kgN/ha. This shows that in this trial the use of a single application of TwinN was able to greatly reduce the need for nitrogen fertiliser while still achieving high yields.

Overall, the season was limiting to yield and greater expression of treatment responses and/or differences may have occurred with a softer finish to the season.

TRIAL DETAILS

The trial was performed and analysed by Agrisearch Services Pty Ltd.

Design: Randomised Complete Block with four replicates.
Plot Size: 7 m x 12m. The plots were trimmed to 10 m lengths late season to facilitate harvest. All assessments were conducted on the centre two planter passes. The outer passes were included as a buffer.

Mapleton Agri Biotec Pty Ltd

137 Obi Obi Road, Mapleton Qld 4560 Australia

Phone: +61 7 5445 7151 Fax: +61 7 5445 7769
Email: info@mabiotec.com www.mabiotec.com

Mapleton International Ltd

Phone: +44 1666 849415
Email: info@mapletoninternational.com

www.mapletoninternational.com

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TwinN Applications

Date & Application	Time of Day	Temp. (°C)	Relative Humid. (%)	Cloud Cover (%)	Wind (km/hr)	Growth Stage	Disease Incidence
16.6.09: Direct Inject	1500-1800	18-24	31-41	10	5-8	Sowing	nil
7.8.09: Foliar	0300-0430	11-13	67-78	Nil	3-5	Zadoks 24-25	nil

Foliar application conditions: crop foliage was pre-sprayed to wetness of moderate dew. Zadoks 24-25 is early to mid-tillering (4-5 tillers/plant).

	Direct Inject Treatments	Foliar Treatments
Equipment Nozzles	Water Injection Unit on Planter MD015110 flat fan nozzles on each planting boot to apply the treatment, in and around the seed, in a 3 cm band prior to closure.	Hand Held Boom Spray MD015110 flat fan nozzles producing a coarse spray.
Nozzle Spacing	One per 25 cm plant row	50 cm
Pressure	200 kPa, 2 bar	150 kPa, 1.5 bar
Water Volume	420 L/ha	175 L/ha

Site Details

Sowing Date	16 June 2009
Variety	EGA Wylie
Soil Type	Alkaline grey clay. The soil test (below) indicated residual nitrogen was low at the site.
Fertiliser	Urea was applied as part of the treatments. The urea was direct drilled one day prior to planting. 45.5 kg/ha Granulock Supreme Z was applied in-furrow at planting to ensure P, Zn and S were not limiting to growth. This supplied 5 kg/ha N to all plots.
Maintenance Sprays	20/7/09 Hotshot + MCPA LVE (750 mL/ha + 700 mL/ha) applied for broadleaf weed control. 13/8/09 Axial + Adigor (300 mL/ha + 500 mL/100L) applied for wild oat control. 18/8/09 Roundup CT (1.5 L/ha) by shielded spray to trim plot ends to even length.

Seasonal Conditions

The wheat was planted into excellent soil conditions and moisture. This resulted in excellent establishment and early season growth. Warmer than normal, dry conditions persisted in July, and particularly August, which resulted in the crop becoming moisture stressed. Half of each plot was watered to provide the equivalent of 22 mm rain to alleviate these conditions using a trickle tape system. The hot and generally dry conditions continued through to late October. These conditions hastened maturity and reduced yield below the full potential. The crop matured to produce moderate yield, similar to that of the surrounding commercial crop.

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Rainfall Recorded at Bellata Post Office, 2009

Jan	71.2	Apr	78.4	Jul	21.4	Oct	21.4	Pre Seeding RF:	281 mm
Feb	129.4	May	29.8	Aug	6.2	Nov	6.2	Growing Season RF:	182 mm
Mar	2.2	Jun	17.8	Sept	18.4	Dec	18.4	Total RF 2009:	564 mm

SOIL TEST

Analyses conducted by Nutrient Advantage Laboratory
NATA Accreditation No: 11958

Sample Number: 20916896
Test Code: 2002-130
Sample Depth (cm): 0-20

ASSAY	UNIT	VALUE
pH 1:5 water		8.40
pH 1:5 CaCl ₂		7.20
Organic Carbon (OC)	%	0.45
Nitrate Nitrogen (NO ₃)	mg/kg	8.20
Phosphorus (Colwell)	mg/kg	18.00
Phosphorus Buffer Index (PBI_Col)		74.00
Available Potassium	mg/kg	380.00
Sulfate Sulfur (MCP)	mg/kg	2.70
Zinc (DTPA)	mg/kg	0.43
Copper (DTPA)	mg/kg	0.71
Iron (DTPA)	mg/kg	9.80
Manganese (DTPA)	mg/kg	6.10
Boron (Hot CaCl ₂)	mg/kg	1.00
Chloride	mg/kg	10.00
Electrical Conductivity	dS/m	0.10
Electrical Conductivity (Saturated Extract)	dS/m	0.70
Cation Exchange Capacity	meq/100g	30.40
Calcium (Amm-acet.)	%	59.00
Calcium (Amm-acet.)	meq/100g	18.00
Magnesium (Amm-acet.)	%	33.00
Magnesium (Amm-acet.)	meq/100g	9.90
Sodium (Amm-acet.)	%	4.90
Sodium (Amm-acet.)	meq/100g	1.50
Potassium (Amm-acet.)	%	3.20
Potassium (Amm-acet.)	meq/100g	0.98
Calcium/Magnesium Ratio		1.80
Potassium/Magnesium Ratio		0.10
Soil Texture		Clay
Soil Colour		Grey

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