TWINN CROP TRIAL

Wheat: Missouri, USA, 2009

KEY RESULT

- A wheat trial in 2009 at a USDA-ARS (US Dept of Agriculture - Agricultural Research Service) trial site in Missouri showed an 8.9% increase in yield in plots receiving the same fertiliser treatments plus two applications of TwinN versus plots that did not receive TwinN.

TREATMENTS

Treatments	Nitrogen Applied	TwinN Applied
Control	70 kg/ha (62.5 lb/a)	Nil
TwinN	70 kg/ha (62.5 lb/a)	Two Applications

TRIAL RESULTS

TREATMENT	Height		Root Dry Weight		Shoot Dry Weight		Yield Adjusted to 13.5%		
	inch	cm	oz/plant	g/plant	oz/plant	g/plant	(bu/ac)	(kg/ha)	% ^
Control	28.1	71.4	0.31	8.73	0.49	14.01	48.7	3275	-
TwinN	34.2	86.9	0.33	9.40	0.59	16.74	53.5	3565	8.9
p=	0.0001		0.064		0.021		0.026		

All p values less than p = 0.05 are statistically significant. Values in red show that the comparisons are significantly different.

RESULTS

Two applications of TwinN applied in addition to the standard 70 kgN/ha resulted in a significant increase in crop vigour as shown in significantly increased height and shoot weight per plant compared to plots that did not receive TwinN. This translated into a significant increase in grain yield of **8.9%**. These results were achieved despite a relatively low general nutrient status (see soil test at end.)

TRIAL DETAILS

Trials were performed and analysed independently by the University of Missouri/USDA-ARS* on the USDA-ARS Centralia Research Centre in Missouri, USA. The trial design was imposed research strip-blocks within a 14 ha field with three replicates per treatment. Plots were 6 x 15m with 2 x 15m harvested for measurement.

* No endorsement by the University of Missouri or USDA-ARS is implied by this document.

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Test Plots Harvested: 7 August 2009 **Wheat Variety:** Truman
Soils: Typic Ochraqualf (Alfisol order, USDA Taxonomy), pH 5.1, Soil Organic Carbon 2.2%, Soil Organic Matter 3.8%, Total Nitrogen 0.2%.
Fertiliser Applications Across All Plots: Nitrogen applied at 70 kg N/ha (62.5 lb N/a) as anhydrous ammonia.

TwinN Application Conditions

Application 1: 7 April 2009, V6 growth stage (true stem formation), Relative Humidity 65%, Temp 24°C (75°F), partly cloudy.
Application 2: 20 May 2009, V10.1 growth stage (just past boot stage), Relative Humidity 80%, Temp 27°C (80°F), cloudy.
Application Method: Backpack at 190 litres/ha (20 US gall/a).

SOIL ANALYSIS

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Lab ID: 091649-6
Received: 08/13/09
Completed: 08/14/09
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Sample Description: W09 2009 Wheat plot

	ppm	Low	Medium	High	Sufficiency Ranges
Nitrate (NO3-N)	2.29	X			8.00 - 100.00
Ammonium (NH4-N)	2.60	X			5.00 - 35.00
Phosphorus (P)	14.02	X			30.00 - 100.00
Potassium (K)	86.89	X			150.00 - 350.00
Calcium (Ca)	1487.84		X		400.00 - 2000.00
Magnesium (Mg)	134.17		X		100.00 - 300.00
Iron (Fe)	70.43			X	5.00 - 50.00
Manganese (Mn)	21.05		X		8.00 - 50.00
Boron (B)	1.70			X	0.50 - 1.00
Copper (Cu)	0.51	X			1.00 - 12.00
Zinc (Zn)	1.15	X			3.00 - 20.00
Molybdenum (Mo)	0.00	X			0.20 - 0.5
Sodium (Na)	383.82				no data - no data
Aluminum(AL)	246.70				no data - no data
pH	5.06		X		5.00 - 7.00

NO3-N, NH4-N, and pH based on a 1:1 0.01M CaC12 extract, unless otherwise requested.

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