

# 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 (194 lb/a)	Nil
TwinN	70 kg/ha (194 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	<b>53.5</b>	<b>3565</b>	<b>8.9</b>
p=	<b>0.0001</b>		0.064		<b>0.021</b>		<b>0.026</b>		

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 (194 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

USDA-ARS  
302 ABNR bldg - MU  
Columbia, MO 65211

Lab ID: 091649-6  
Received: 08/13/09  
Completed: 08/14/09  
Phone: 573-882-6408  
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Sample Description: W09 *2009 Wheat plot*

	ppm	Low	Medium	High	Sufficiency Ranges
Nitrate (NO <sub>3</sub> -N)	2.29	X			8.00 - 100.00
Ammonium (NH <sub>4</sub> -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

NO<sub>3</sub>-N, NH<sub>4</sub>-N, and pH based on a 1:1 0.01M CaCl<sub>2</sub> extract, unless otherwise requested.