Technical Data Report

Review

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Effects of NUTRIPLANT® SD on Production of Dryland Winter Wheat

Objective

The objective of the study was to evaluate the effects of Nutriplant SD on production of dryland winter wheat.

Materials and Methods

Field trials were conducted on dryland winter wheat (*Triticum aestivum* sp.) at the independently owned and operated agricultural research facility, Irrigation Research Foundation, at Yuma, Colorado, USA, under the supervision of Colorado State University. Trials were conducted in 2004, 2005 and 2006. The wheat was planted at a rate of 67 kg/ha (60 lb/acre). Starter fertilizer in a form of urea was applied each year to the field at a rate of 67 kg nitrogen per hectare (60 lb/acre). Two uniform sections of the field measuring 4.6 by 198 meters (15 by 650 feet) were selected for each trial. One section was treated with Nutriplant SD applied at 2.5 g/kg of seeds (4 oz/100 lb of seeds) just prior to planting. Seeds were thoroughly mixed with the product to obtain a uniform coating. The other section was left untreated as a control. Cultural practices, including fertilization and pest management, followed local practices and were the same for the treated and the control sections. At harvest, wheat yield, grain density and percent grain moisture were determined.

Results

Nutriplant SD consistently increased grain yield of the winter wheat. In 2004, 2005 and 2006, plots treated with Nutriplant SD produced, respectively, 230 kg/ha (3.4 bu/acre), 695 kg/ha (10.3 bu/acre) and 446 kg/ha (6.6 bu/acre) more than the control plots (Table 1). The average yield increase for the three years was 47.3%, ranging from 13.6% in 2004 to 65.7% in 2006. The two largest yield increases occurred in 2005 and 2006, years with low precipitation of 285 mm (11.2 inches) and 218 mm (8.6 inches) per season, respectively, compared to 353 mm (13.9 inches) in 2004. In 2006, plots were also exposed to extreme heat early in the season. These results indicate that Nutriplant SD helps plants overcome the negative effects of abiotic stress caused by drought and high temperature.

Table 1. Results of Nutriplant SD on dryland winter wheat yields. Irrigation Research Foundation, Yuma, Colorado, USA.

Year	Grain Yields						
	Control		Nutriplant SD		Difference		
	kg/ha)	bu/acre)	(kg/ha)	(bu/acre)	(kg/ha)	(bu/acre)	(%)
2004	1,685	25.0	1,915	28.4	230	3.4	13.6
2005	1,058	15.7	1,753	26.0	695	10.3	65.7
2006*	714	10.6	1,160	17.2	446	6.6	62.5

**Low yields are a result of extreme heat early in the season.*

Nutriplant SD increased the seed density by an average of 2.8% and reduced grain moisture by an average of 2.2% (Table 2). Grain density and moisture are important factors of crop quality.

Table 2. Results of Nutriplant SD on grain density and moisture of dryland winter wheat. Irrigation Research Foundation, Yuma, Colorado, USA.

Year	Grain Density				Grain Moisture (%)	
	Control		Nutriplant SD			
	(g/liter)	(lb/bu)	(g/liter)	(lb/bu)	Control	Nutriplant SD
2004	739	57.4	740	57.4	15.0	14.3
2005	734	57.0	759	59.0	14.4	14.3
2006	708	55.0	745	57.9	10.9	10.6
Mean	*727*	*56.5*	*748*	*58.1*	*13.4*	*13.1*

Conclusions

Nutriplant SD increased dryland winter wheat yields by an average 47.3% compared to the untreated controls. Nutriplant SD consistently improved seed quality as expressed in increased grain density and decreased grain moisture at harvest.

The highest yield increases were observed under drought and heat stress conditions, indicating that Nutriplant SD helps crops overcome negative effects of abiotic stress which is the main cause of yield reduction in crops.

Resources

WHEAUSCO0401
WHEAUSCO0501
WHEAUSCO0601