Technical Data Report

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Effects of NUTRIPLANT™ AG on Production of Dryland Winter Wheat

Introduction

Nutriplant SD was found effective in increasing production of dryland winter wheat (TDR Review Vol. 2(6)2012) but effects of foliar application of Nutriplant AG product on wheat production have not been evaluated. The objective of this study was to determine effectiveness of foliar treatment of Nutriplant AG on the production of dryland winter wheat. Two different Nutriplant AG treatments were evaluated to determine the most effective application timing.

Materials and Methods

Field trials were conducted on winter wheat (*Triticum aestivum* cv. Beyond) at the independently owned and operated agricultural research facility, Irrigation Research Foundation, at Yuma, Colorado, USA, under the supervision of Colorado State University. The dryland winter wheat was planted at a rate of 67 kg/ha (60 lb/acre). Four uniform sections of the field were selected for the trial. Each section measured 4.6 by 198 meters (15 by 650 feet). The following three treatments were evaluated:

1) Nutriplant AG applied once in the spring at "green-up".
2) Nutriplant AG applied twice: in the spring at "green-up" and again at the "boot" stage (Fickes 10.5 stage).
3) Untreated control.

Nutriplant AG was applied at 1,200 ml/ha (16 fl oz/acre) in a total volume of spray solution of 84 liter/ha (9 gal/acre) using a ground spray applicator at timings listed above. Liquid fertilizer 32-0-0 was applied to all plots at a rate of 173 liter/ha (18.4 gallon/acre) in the spring, four days before "green-up" Nutriplant AG application, using a stream bar nozzle application. About six weeks after the first Nutriplant AG application, all plots were treated with Beyond herbicide at a rate of 440 ml/ha (6 fl oz/acre), a non-ionic surfactant at 946 ml/379 liter (1 quart/100 gallon) and liquid ammonium sulfate at 1.89 liter/379 liter (2 quarts/100 gallon) in a total volume of spray solution of 140 liter/ha (15 gallon/acre). Barrage fungicide was applied at a rate of 440 ml/ha (6 fl oz/acre). All other cultural practices followed local practices and were the same for the treated and the untreated plots. At harvest time, grain yield, percent moisture and grain density were determined and grain yields adjusted to 12% moisture and 772 g/liter (60 lb/bu) grain density.

Results

Both Nutriplant AG treatments improved wheat yield (Table 1). One application of Nutriplant AG at spring "green-up" increased yield by 391 kg/ha (5.8 bu/acre), an 18.8% increase over untreated control. Two applications of Nutriplant AG in the spring at "green-up" and again at "boot" stage increased yields by additional 3.3%, a 459 kg/ha (6.8 bu/acre) increase over control. During this spring the crop was exposed to abiotic stress of cool temperatures, heavy precipitation and hail. Nutriplant AG product applied during this time helped plants to overcome the negative effects of abiotic stress, the main cause of yield reduction in crops. Nutriplant AG treatments additionally improved grain quality by reducing grain moisture and increasing grain density.

Table 1. Effects of Nutriplant AG on dryland winter wheat. Irrigation Research Foundation, Yuma, Colorado, USA.

Treatment	Grain Yield*					Grain Moisture	Grain Density	
	(kg/ha)	(bu/acre)	Difference					
			(kg/ha)	(bu/acre)	(%)	(%)	(g/liter)	(lb/bu)
Control	2,076	30.8	--	--	--	12.4	695	54.0
Nutriplant AG in spring at green up	2,467	36.6	391	5.8	18.8	11.8	721	56.0
Nutriplant AG in spring at green up and again at boot stage	2,535	37.6	459	6.8	22.1	12.2	734	57.0

**Adjusted to 12% moisture and 722 g/liter (60 lb/bu) grain density.*

Conclusions

Nutriplant AG applied in the spring improved production of dryland winter wheat over untreated control by 18.8% when applied once at "green-up" and by 22.1% when applied twice at "green-up" and again at the "boot" stage.

Nutriplant AG treatments also improved grain quality as indicated by reduced grain moisture and increased grain density.