

# Technical Data Report

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## Effects of NUTRIPLANT™ SD and NUTRIPLANT™ AG on Production of Irrigated Winter Wheat

### Introduction

Nutriplant SD was found effective in increasing production of irrigated winter wheat (TDR Review Volume 2(8)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 the effectiveness of foliar treatment of Nutriplant AG applied in addition to Nutriplant SD seed treatment on the production of irrigated winter wheat. Two different Nutriplant AG treatments were evaluated to determine the most effective time of application.

### Materials and Methods

Field trials were conducted on winter wheat (*Triticum aestivum* cv. Bill Brown) at the independently owned and operated agricultural research facility, Irrigation Research Foundation, at Yuma, Colorado, USA, under the supervision of Colorado State University. The irrigated wheat was planted at a rate of 135 kg/ha (120 lb/acre). All seeds were treated with Dividend applied at 2.6 ml/kg of seeds (4 fl oz/100 lb of seeds) and Cruiser at 0.52 ml/kg of seeds (0.8 fl oz/100 lb of seeds). Four uniform sections of the field, each measuring 4.6 by 198 meters (15 by 650 feet) were selected for the trial. The following four treatments were evaluated:

1. Nutriplant SD at planting.
2. Nutriplant SD at planting plus an application of Nutriplant AG in the fall at the 6-8 leaf stage (about five weeks after planting).
3. Nutriplant SD at planting plus an application of Nutriplant AG in the spring at “green-up”.
4. Untreated control.

Nutriplant SD was applied to the seeds at a rate of 2.5 g/kg of seeds (4 oz/100 lb of seeds) just prior to planting. The product was thoroughly mixed with the seeds to obtain a uniform coating. Nutriplant AG was applied at a rate of 1,200 ml/ha (16 fl oz/acre) in total volume of spray solution of 84 liter/ha (9 gallon/acre) using a ground spray applicator at timings listed above. All plots were treated in the early spring with two herbicides: Olympus at a rate of 266 ml/ha (9 fl oz/acre) and 2-4, LV6 at 440 ml/ha (6 fl oz/acre) applied with a non-ionic surfactant at 0.25% in a total volume of spray solution at 140 liter/ha (15 gallon/acre). The first spring application of Nutriplant AG was made four days after herbicide application. A liquid fertilizer, 28-0-0-5, was applied four times during growing season through overhead irrigation system at a rate of 56 liter/ha (6 gallon/acre). The first application of this fertilizer was done eight days after herbicide treatment and then every two weeks. In the late spring, all plots were treated for rust with aerial application of Provaro 421 SC at 476 ml/ha (6.5 fl oz/acre), Tradition 93 at 2,344 ml/ha (32 fl oz/acre) and Vector at 2,247 g in 28 liters of water per hectare (32 oz in 3 gallons of water per acre). Other cultural practices followed local practices and were the same for the treated and the control plots. At harvest, 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

The best treatment was Nutriplant SD applied at planting time with an application of Nutriplant AG in the spring at “green-up”, which increased yields of irrigated winter wheat by 708 kg/ha (10.5 bu/acre), an 11.6% increase over the untreated control (Table 1). Nutriplant SD alone increased irrigated winter wheat grain yields by 3.1% over the untreated control. When Nutriplant SD was applied to the seeds at planting and Nutriplant AG was applied to the foliage in the fall, wheat yields increased by an average of 4.3%.

*Table 1. Effects of Nutriplant SD and Nutriplant AG on production of irrigated winter wheat. Irrigation Research Foundation, Yuma, Colorado, USA.*

Treatment	Grain Yield*				
	Yield		Difference		
	(kg/ha)	(bu/acre)	(kg/ha)	(bu/acre)	(%)
Control	6,087	90.3	--	--	--
Nutriplant SD at planting	6,276	93.1	189	2.8	3.1
Nutriplant SD at planting Nutriplant AG applied in the fall	6,350	94.2	263	3.9	4.3
Nutriplant SD at planting Nutriplant AG applied in the spring	6,795	100.8	708	10.5	11.6

\*Adjusted to 12% moisture and 772 g/liter (60 lb/bu) grain density

These results prove that foliar treatment of Nutriplant AG to irrigated winter wheat applied in addition to Nutriplant SD seed treatment at planting produced higher yields than Nutriplant SD seed treatment alone. Application time of Nutriplant AG at spring “green-up” was more effective resulting in almost three times higher yield increase than application in the fall.

## Conclusions

Application of Nutriplant AG to the irrigated winter wheat in the spring at “green-up” in conjunction with Nutriplant SD at planting produced the highest yield increase.

The most effective application time for Nutriplant AG on production of irrigated winter wheat is at spring “green-up”.