

# Technical Data Report

## Review

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### Effects of NUTRIPLANT™ AG on Corn Production

#### Objective

The objective of this study was to determine the effects of Nutriplant AG on corn production.

#### Materials and Methods

Field trials were conducted on corn (*Zea mays* L.) of 105 to 110 day maturity, at the independently owned and operated agricultural research facility, Irrigation Research Foundation, at Yuma, Colorado, USA, under the supervision of Colorado State University. Corn hybrid Dekalb 60-18 was tested in 2006 and 2008. Corn was planted on 9 May in 1999, 1 May in 2006, and 8 May 2008. Planting populations were similar each year: 81,543 seeds/ha (33,000 seeds/acre) in 1999, 74,130 seeds/ha (30,000 seeds/acre) in 2006, and 80,308 seeds/ha (32,500 seeds/acre) in 2008. Uniform plots were selected each year for the trial. Each plot consisted of four rows, each 76 cm (30 inches) wide and 198 meters (650 feet) long. One plot was treated with Nutriplant AG applied at the 6-8 leaf stage at a rate of 1,170 ml/ha (16 fl oz/acre). The other plot was left untreated as a control. In 1999, the control and treated plots were replicated three times. Each year fertilizer program consisted of one application before planting, second as starter fertilizer at planting followed by liquid fertilizer applications through the sprinkler system during growing season. In 1999, plots were fertilized with 168 kg N/ha (150 lb N/acre) in the form of liquid ammonia, starter 38-38-0-11S-0.3Zn fertilizer at 178 l/ha (19 gal/acre), and 28-0-0-5S at 94 l/ha (10 gal/acre) with 1.9 cm (0.75 inches) of irrigation. In 2006, plots were fertilized with 157 kg N/ha (140 lb N/acre) in the form of dry urea treated with Agrotain urease inhibitor at a rate of 4.2 l/1000 kg (1 gallon/2000 lb) as pre-plant on 9 February, starter 25-40-3-6S-0.2Zn fertilizer at 159 l/ha (17 gal/acre) at planting, four applications of 32-0-0 fertilizer at 65 l/ha (7 gal/acre) through sprinkler irrigation on 17 May, 3, 17 and 30 June, and 12-0-0-26S fertilizer at 47 l/ha (5 gal/acre) through sprinkler irrigation on 8 July. In 2008, plots were fertilized using strip-till implement with 20.5-35.8-0 at 94 l/ha (10 gal/acre) applied 10 cm (4 inches) deep and 140 l/ha (15 gal/acre) applied 25 cm (10 inches) deep as pre-plant on 27 March, in furrow starter Pro-Germinator+Micro 500 (Agro-Culture Liquid Fertilizer) at 28 l/ha (3 gal/acre) applied at planting, and 32-0-0 fertilizer at 94 l/ha (10 gal/acre) applied through sprinkler system on 23 June, 7, 16 and 24 July. Herbicide control was different each year and consisted of Bicep Lite II at 4.7 l/ha (2 qt/acre) applied on 19 May in 1999; Degree Xtra at 6.8 l/ha (2.9 qt/acre) and Roundup Weather Max at 2 l/ha (28 fl oz/acre) with ammonium sulfate (AMS) at 2 kg/100 liters (17 lb/100 gal) applied pre-emergence on 2 May in 2006; and Degree Xtra at 6.8 l/ha (2.9 qt/acre), Roundup Weather Max at 2.3 l/ha (32 fl oz/acre), and Liberty at 2.9 l/ha (40 fl oz/acre) with liquid AMS at 0.5 l/100 liters (2 qt/100 gal) applied on 14 May, Status at 585 ml/ha (8 fl oz/acre) with non-ionic surfactant (NIS) and AMS, both at 0.5 l/100 liters (2 qt/100 gal) applied on 23 June, and Roundup Weather Max at 2.3 l/ha (32 fl oz/acre) with AMS at 0.5 l/100 liters (2 qt/100 gal) applied on 28 June in 2008. Other cultural practices, including pest management, followed local practices and were the same for treated and untreated plots. Corn was harvested on 28 October in 1999, 2 November in 2006, and 11 November in 2008. Grain yields were adjusted to 15.5% moisture. Unit conversions were calculated using USDA Conversion Factors and Tables posted at:

<http://www.mn.nrcs.usda.gov/technical/ecs/nutrient/planning/planning.htm>

## Results

Application of Nutriplant AG increased corn grain yields by 834 kg/ha (13.3 bu/acre) in 1999, 1,085 kg/ha (17.3 bu/acre) in 2006, and 558 kg/ha (8.9 bu/acre) in 2008 over the untreated control. On average across three years, Nutriplant AG contributed to yield increase of 826 kg/ha (13.2 bu/acre). High yield increases with Nutriplant AG applications were observed despite the fact that each year plots were fertilized with high input programs consisting of application of fertilizer before planting, then application of starter fertilizer at planting followed by liquid fertilizer applications through the sprinkler system during growing season, indicating that Nutriplant AG improves corn yields even at optimum fertilization programs. These results also suggest that Nutriplant AG helped the crop to overcome negative effects of stress since each year corn plants were exposed to abiotic stress: spring was very cool and extremely windy in 1999, and crop was exposed to high winds and extreme early heat in 2006 and 2008.

*Table 1. Influence of Nutriplant AG on corn yields. Irrigation Research Foundation, Yuma, Colorado, USA.*

Year	Corn Yields						
	Control		Nutriplant AG		Difference		Difference (%)
	(kg/ha)	(bu*/acre)	(kg/ha)	(bu/acre)	(kg/ha)	(bu/acre)	
1999	12,425	198.1	13,259	211.4	834	13.3	6.7
2006	11,867	189.2	12,952	206.5	1,085	17.3	9.1
2008	10,982	175.1	11,540	184.0	558	8.9	5.1
<i>Mean</i>	<i>11,758</i>	<i>187.5</i>	<i>12,584</i>	<i>200.6</i>	<i>826</i>	<i>13.2</i>	<i>7.0</i>

\* One bushel (bu) of corn equals 56 lb at 15.5% grain moisture

## Conclusions

Nutriplant AG applied at 6 to 8 leaf stage increased corn yield by an average of 7.0% over untreated control. Compared to untreated control, corn yield increased with Nutriplant AG application by 6.7, 9.1 and 5.1% in 1999, 2006 and 2008, respectively.

## References

CORNUSCO9901  
CORNUSCO0601  
CORNUSCO0801