

# Technical Data Report

## Review

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## Effects of Nutriplant™ SD and AG on Alfalfa Production

### Objective

The objective of the study was to evaluate the effect of Nutriplant SD and Nutriplant AG on production of alfalfa.

### Materials and Methods

Field trials were conducted on alfalfa (*Medicago sativa* L.) at the independently owned and operated agricultural research facility, Irrigation Research Foundation located in Yuma, Colorado, USA, under the supervision of Colorado State University. Trials were conducted in 2002, 2004 and 2005. Alfalfa was planted at 24.6 kg/ha (22.0 lb/acre) in spring 2001. The experiment consisted of two treatments: 1) untreated control, and 2) alfalfa seeds treated with Nutriplant SD at 250 g/100 kg (4 oz/100 lb) seeds. Additionally, Nutriplant AG was applied over the Nutriplant SD treatment in 2005. The treated and untreated plots were managed the same way. Dry fertilizer (8.25-39-60-10.05) was spread at 208 kg/ha (186 lb/acre) on 19 February 2002. The same rate of fertilizer was applied on 27 February 2004 and 9 March 2005, but with the addition of Agrotein urease inhibitor at 9.3 l/ha (1 gal/acre). Herbicide application included Raptor at 0.22 l/ha (3 fl oz/acre) with urea ammonium nitrate (32%) at 2 l/100 l (2 gal/100 gal) with COC at 2.3 l/ha (1 qt/acre) on 8 April, Pursuit at 100.9 g/ha (1.44 oz/acre) with Select at 0.6 l/ha (8 oz/acre) with COC at 250 ml/100 l (1 qt/100 gal) on 12 June, and Pursuit at 50.4 g/ha (0.72 oz/acre) with Select at 0.6 l/ha (8 oz/acre) and COC at 250 ml/100 l (1 qt/100 gal) on 3 August in 2002. In 2004, plots were sprayed with Pursuit at 89.7 g/ha (1.28 oz/acre) and ammonium sulfate at 1.8 kg/100 l (15 lb/100 gal) and APSA-80 at 250 ml/100 l (1 qt/100 gal) and Poast at 2.9 l/ha (2.5 pt/acre). All plots were sprayed with Pursuit at 98.1 g/ha (1.4 oz/acre), Select at 0.6 l/ha (8 oz/acre), ammonium sulfate at 2.8 kg/ha (2.5 lb/acre) and APSA-80 at 1% (vol/vol) on 4 April, Raptor at 0.3 l/ha (4 fl oz/acre) with Select at 0.6 l/ha (8 oz/acre), ammonium sulfate at 2.8 kg/ha (2.5 lb/acre) and APSA-80 at 1% (vol/vol) on 14 June in 2005. Nutriplant AG was applied in the selected section at 1.2 l/ha (16 oz/acre) on 1 April, 9 June, 11 July and 10 August in 2005. Other cultural practices followed local practices and were the same for the treated and control sections. Alfalfa was cut for hay four times each year on 5 May, 28 June, 26 July and 27 August in 2002, 24 May, 28 June, 9 August and 13 September in 2004, and 2 June, 1 July, 1 and 31 August in 2005. Relative feed value (RFV) was measured using the following scale: low – RFV under 100, fair – RFV 100-125, good – RFV 126-150, premium – RFV 151-179, and supreme – RFV over 180.

### Results

Nutriplant SD application to seeds generally increased the alfalfa feed values (Table 1). Each year and for most cuttings, plots treated with Nutriplant SD resulted in higher feed values than untreated control plots. The feed value increased feed value by an average of 13.6% in 2002 and 4.5% in 2004. Feed values in 2005 were very similar between control and treated plots, with treated plots being slightly less (1.9%) than control plots. Comparing individual cuttings to the control plots, application of Nutriplant SD improved the relative feed value by 20.8% for the 1<sup>st</sup> cutting in 2002, 15.6% for the 2<sup>nd</sup> cutting in

2004, and 5% for the 1<sup>st</sup> cutting in 2005. On average, application of Nutriplant SD increased the feed value of alfalfa by 5.4%. For the Nutriplant AG applications, the feed value improved on average by 2.2%, and was as high as 10.8% for the 1<sup>st</sup> cutting in 2005.

*Table 1. Effect of Nutriplant SD and Nutriplant AG (2005 only) on alfalfa hay relative feed values. Irrigation Research Foundation, Yuma, Colorado, USA.*

Product	Year	1	2	3	4	Average
Control	2002	119.2	125.7	118.2	129.5	123.2
SD	2002	144.0	146.3	140.9	128.4	139.9
Difference (%)		20.8	16.4	19.2	-0.8	13.6
Control	2004	-	139.3	142.2	200.7	160.7
SD	2004	-	161.1	134.2	208.6	168.0
Difference (%)		-	15.6	-5.6	3.9	4.5
Control	2005	169.2	167.0	153.0	196.6	171.5
SD	2005	177.6	161.1	157.0	176.9	168.2
Difference (%)		5.0	-3.5	2.6	-10.0	-1.9
Overall difference (%)		12.9	9.5	5.4	-2.3	5.4
Control	2005	169.2	167.0	153.0	196.6	171.5
AG	2005	187.5	170.2	161.3	182.0	175.3
Difference (%)		10.8	1.9	5.4	-7.4	2.2

Apart from two cuttings, application of Nutriplant SD improved the hay yield of alfalfa relative to the control plots (Table 2). Compared to the control treatment, application of Nutriplant SD improved hay yields by an average of 2.98 T/ha (1.33 T/acre) in 2002, 0.31 T/ha (0.14 T/acre) in 2004, and 3.36 T/ha (1.5 T/acre) in 2005. The application of Nutriplant SD improved average alfalfa yields across all years by 16.2%. Application of Nutriplant AG improved hay yields by 0.87 T/ha (0.39 T/acre) in 2005 over the control plots. The improved yield and feed values using Nutriplant SD could possibly be due to more extensive root development with Nutriplant SD applications compared to the untreated plots.

### **Conclusions**

Compared to the untreated control, Nutriplant SD increased alfalfa feed values by an average of 5.4% and hay yields by 16.2%. In 2005, Nutriplant AG application improved feed values by 2.2% and increased hay yield by 6.5%.

Table 2. Effect of Nutriplant SD and Nutriplant AG (2005 only) on alfalfa hay yields. Irrigation Research Foundation, Yuma, Colorado, USA.

Product	Year	1st cutting	1st cutting	2nd cutting	2nd cutting	3rd cutting	3rd cutting	4th cutting	4th cutting	Total Yield	Total Yield
		T/ha	T/acre	T/ha	T/acre	T/ha	T/acre	T/ha	T/acre	T/ha	T/acre
Control	2002	4.30	1.92	3.36	1.50	2.91	1.30	3.81	1.70	14.38	6.42
SD	2002	3.58	1.60	5.60	2.50	4.37	1.95	3.81	1.70	17.36	7.75
Difference (weight)		-0.72	-0.32	2.24	1.00	1.46	0.65	0.00	0.00	2.98	1.33
Difference (%)		-16.7		66.7		50.0		0.0		20.7	
Control	2004	-	-	3.81	1.70	4.48	2.00	2.58	1.15	10.86	4.85
SD	2004	-	-	3.99	1.78	4.48	2.00	2.71	1.21	11.18	4.99
Difference (weight)		-	-	0.18	0.08	0.00	0.00	0.13	0.06	0.31	0.14
Difference (%)		-		4.7		0.0		5.2		2.9	
Control	2005	5.15	2.30	2.24	1.00	3.70	1.65	2.42	1.08	13.51	6.03
SD	2005	6.16	2.75	2.69	1.20	5.38	2.40	2.64	1.18	16.87	7.53
Difference (weight)		1.01	0.45	0.45	0.20	1.68	0.75	0.22	0.10	3.36	1.50
Difference (%)		19.6		20.0		45.5		9.3		24.9	
Overall difference (%)		1.4		30.5		31.8		4.8		16.2	
Control	2005	5.15	2.30	2.24	1.00	3.70	1.65	2.42	1.08	13.51	6.03
AG	2005	3.90	1.74	2.69	1.20	5.38	2.40	2.42	1.08	14.38	6.42
Difference (weight)		-1.25	-0.56	0.45	0.20	1.68	0.75	0.00	0.00	0.87	0.39
Difference (%)		-24.3		20.0		45.5		0.0		6.5	