

Evaluation of Palisade (trinexapac-ethyl) on fifteen Kentucky bluegrass varieties grown for seed in central Oregon

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Abstract

The growth regulator, Palisade (trinexapac-ethyl), was evaluated on 15 Kentucky bluegrass (*Poa pratensis* L.) varieties grown for seed at the Central Oregon Agricultural Research Center. One set of plots is a first-year stand and the other is a second-year stand. The influence of Palisade on seed yield, plant height, and lodging were documented. Treatments were applied at the boot stage and varieties were harvested based on maturity. Seed yields were significantly increased for 12 of 15 varieties in the first year field, and 4 of 15 in the second year field. Application of Palisade uniformly reduced plant height and decreased lodging, with the exception of one data point.

Introduction

Research to evaluate Palisade on Kentucky bluegrass was conducted in commercial seed fields of 'Merit' or 'Geronimo' from 1999 to 2003. Yields were increased by 31 to 36 percent 4 of the 5 years when Palisade was applied at 22 oz/acre from the second node (Feekes 7) to heads just becoming visible (Feekes 10.1). Late application when the heads extended just above the flag leaf (Feekes 10.4) produced the greatest reduction in plant size, while plants tended to outgrow the effect of earlier Palisade applications. No differences between treatments in weight per 1,000 seeds were observed, and percent germination was not adversely affected.

Methods and Materials

This research initiated in 2007 was conducted at the Central Oregon Agricultural Research Center (COARC) near Madras. A split-plot design was used, with 10-ft by 60-ft main plots and 3 10-ft by 20-ft subplots. Subplots were randomized and included Palisade, Beacon (primisulfuron), and an untreated check in the first-year field planted to 2008, and Palisade and an untreated check in the second-year field planted during 2007. Main plots were replicated four times in a randomized complete block design. Palisade was applied at 24 oz/acre on May 8, 2009 when most varieties were in the boot stage.

Application was made with a CO₂-pressurized, hand-held boom sprayer at 40 psi and 20 gal/acre water using TeeJet 8002 nozzles. Plant height was measured in the first-year field on May 22 and June 3 and in the second-year field on May 27 and June 3. Percent lodging was estimated on July 1. A section 6-ft x 17 ft of each plot was swathed as varieties matured from July 2 to 9. This was followed by combining of the plots at an appropriate timing. Equipment used was a plot-sized swather and Wintersteiger plot combine. Seed samples were transported to the Hyslop Farm near

Corvallis where they were debearded, run through a small scale Clipper cleaner, and clean seed weight was determined.

Results and Discussion

1st Year Field

Seed yield on the first year field was significantly higher for 12 of the 15 varieties treated with Palisade (Table 1). Yield across all varieties averaged 35 percent higher than the untreated check. Average yield for untreated plots across varieties was 1025 lb/acre compared with 1340 lb/acre for those treated with Palisade, with varieties varying from a 12 to 92 percent increase. The trend was a reduction in plant height of 2.0 inches on May 22 and 2.6 inches on June 3, with a 37 percent reduction in lodging across varieties.

2nd Year Field

Seed yield on the second year field was significantly higher for 4 of the 15 varieties, with the trend for increased yields (Table 2). The exception was the variety 'Crest'. The average yield increase with Palisade across varieties was 22 percent. However, seed yields on the second year field were down significantly from last year, with an average of 702 lb/acre for the untreated plots compared to 822 lb/acre for those treated with Palisade. It is believed this overall reduction in yield was due to a lack of control for winter grain mite and ergot. The trend was a reduction in plant height of 3.4 inches on May 27 and 4.5 inches on June 3, with a 34 percent reduction in lodging across varieties.

As a first year field last year, this field produced an average yield across varieties of 1266 lb/acre for the untreated plots and 1383 lb/acre for plots treated with Palisade. The average yield increase across varieties was 11 percent for Palisade treated plots. The trend was a reduction in plant height of 1.3 inches, and a 44 percent reduction in lodging across varieties.

References

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Table 1. Effect of Palisade growth regulator on seed yield, lodging, and plant height on a first year field of 15 Kentucky bluegrass varieties planted August, 2008 at the COARC, Madras, Oregon.

Variety	Clean seed yield (lb/acre)				Evaluation Dates					
					7/1/09		5/27/09		6/3/09	
	Check	Palisade	% Check	Signif.	Lodging (%)		Plant ht (in)		Plant ht (in)	
Atlantis	1206	1516	126	***	69	43	15.3	13.3	27.8	25.3
Merit	1305	1602	123	**	66	11	13.0	10.5	23.0	19.0
Rhapsody	888	1101	124	*	26	3	14.0	10.8	24.3	19.3
Valor	776	942	122	ns	63	8	11.3	9.5	19.0	14.0
Bariris	614	1179	192	***	100	93	17.0	16.0	26.5	25.3
Crest	1261	1467	116	*	48	8	12.3	10.0	21.8	19.3
Monte Carlo	743	911	123	ns	50	16	11.3	9.8	19.0	15.8
Shamrock	1682	1918	114	**	83	28	18.0	14.3	27.8	25.5
A00-891	1311	1712	131	***	58	16	14.3	14.0	21.3	21.3
A00-1400	663	1012	153	***	59	31	12.0	10.3	23.0	20.0
Bandera	1060	1190	112	ns	15	3	11.5	9.0	21.3	17.3
Bordeaux	890	1302	146	***	81	13	16.0	11.5	25.0	21.3
Volt	1211	1514	125	***	85	48	19.3	16.5	28.3	26.0
Zinfandel	783	1216	155	***	66	15	14.0	12.5	21.8	19.5
A01-299	981	1529	156	***	46	19	15.5	15.8	22.8	24.3

¹ Comparison with paired t-test: ns=non-significant, * for P=0.10, ** for P=0.05, *** for P= 0.01

Table 2. Effect of Palisade growth regulator on seed yield, lodging, and plant height on a second year field of 15 Kentucky bluegrass varieties planted August, 2007 at COARC, Madras, Oregon.

Variety	Clean seed yield (lb/acre)				Evaluation Dates					
					7/1/09		5/27/09		6/3/09	
	Check	Palisade	% Check	Signif.	Lodging (%)		Plant ht (in)		Plant ht (in)	
Atlantis	1002	1049	105	ns	23	3	17.0	14.0	25.8	20.5
Merit	860	884	103	ns	13	1	13.3	9.8	21.3	15.8
Rhapsody	412	661	160	**	15	0	12.0	10.3	18.8	14.8
Valor	487	584	120	ns	31	0	11.3	7.5	17.0	11.3
Bariris	203	344	169	ns	85	60	20.0	14.3	27.0	24.5
Crest	838	708	84	ns	25	0	13.8	10.0	20.8	15.3
Monte Carlo	561	636	113	ns	71	6	11.3	9.5	17.0	13.0
Shamrock	818	928	113	ns	69	14	19.0	14.0	27.0	22.3
A00-891	951	1187	125	*	30	3	12.5	9.8	21.0	17.3
A00-1400	480	657	137	ns	56	10	12.3	11.3	17.8	15.5
Bandera	655	748	114	ns	24	5	13.8	10.3	20.3	15.8
Bordeaux	751	757	101	ns	53	10	15.0	10.0	24.5	16.5
Volt	950	1133	119	ns	81	10	20.3	16.0	28.0	23.8
Zinfandel	732	980	134	**	41	16	12.0	9.3	16.8	12.0
A01-299	825	1070	130	**	33	1	15.0	11.5	19.3	17.3

¹ Comparison with paired t-test: ns=non-significant, * for P=0.10, ** for P=0.05, *** for P= 0.01