

Effects Trinexapac-ethyl (TE) on Established Timothy Grass Seed Crop

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Introduction

Trinexapac-ethyl is commonly used on grass seed crops in Oregon, Denmark and New Zealand to improve harvestability and seed yields. This plant growth regulator (PGR) shortens internodes which reduces lodging and allows for better pollination, seed set and harvesting. Data collected on perennial ryegrass and tall fescue in Oregon has shown TE can reduce seed head length and increase seeds/head which leads to an increase in seeds/m².

In Canada, Parlay (trinexapac-ethyl) is registered on perennial ryegrass grown for seed production. It is a Syngenta product distributed by BrettYoung Seeds. The Peace Region Forage Seed Association is aiming to increase the label registration to include clovers, brome-grasses, timothy and creeping red fescue through the completion of research and field scale trials if the product shows potential.

Materials and methods

Trials were conducted on established creeping red fescue, timothy and meadow brome-grass seed crops at AAFC Beaverlodge in 2015, 2016 and 2017. Parlay was applied at 3 rates x 2 stages to small plot (2 x 10 m) RCB with 4 replicates. Grasses received a fall nitrogen application. Some treatments included early spring applied UAN with and without growth regulator (Table 1).



Figure 1. Lodging in UAN & check treatments in 2016 Timothy.

Timothy Summary

AAFC Beaverlodge received above average precipitation in both 2015 and 2016. Applications of TE reduced plant heights in 2015 and 2016 and reduced lodging in 2016. The check did not lodge in 2015. TE increased seed yields on first year timothy stands by 50% in 2015 and 30% in 2016. Slight increase in seed yield on 2nd year stand in 2016. No yield increase from additional spring applied UAN although trend for highest yields with spring UAN+TE (mid-rate at 2 nodes). TE has not affected seed germination.

Table 1. Growth Regulator Treatment List

Treatment (kg ai/ha)	Stage	UAN (spring applied)	
1	0.200	2 Nodes	
2	0.300	2 Nodes	
3	0.400	2 Nodes	
4	0.200	Heading	
5	0.300	Heading	
6	0.400	Heading	
7	0.300 + UAN	2 Nodes	40 lbs of N/acre*
8	0.300 + UAN	Heading	40 lbs of N/acre*
9	UAN		40 lbs of N/acre*
10	Check		

*50 l/acre of UAN

Table 2. Growing Season Precipitation (inches)

	2016	2015	LTA (1981-2011)
May	2.6	1.2	1.6
June	4.5	3.6	2.5
July	2.3	5.8	2.8
August	8.5	1.9	2.3
September	1.1	0.8	1.7
October	1.5	1.1	1.0
TOTAL	20.5	14.4	11.9

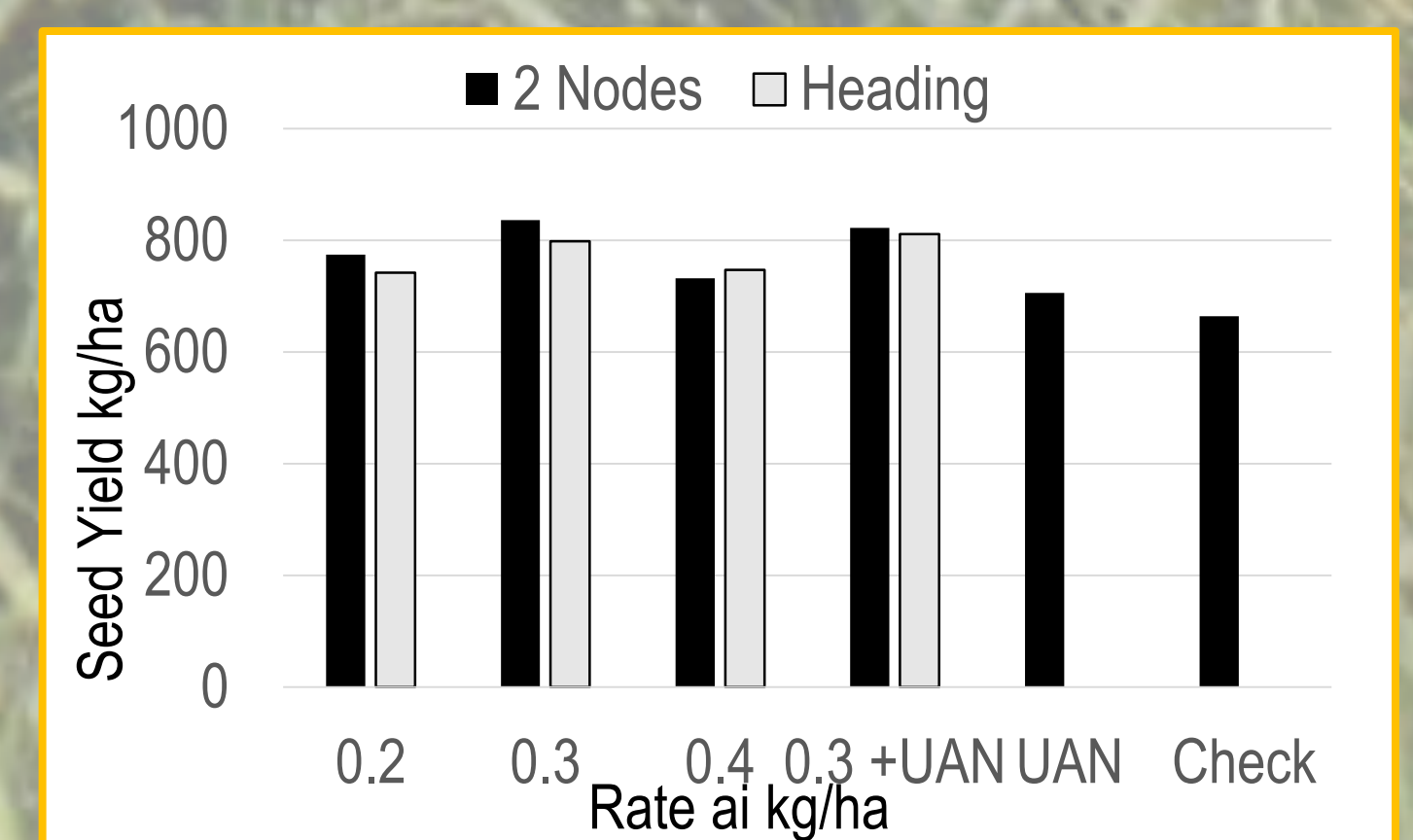
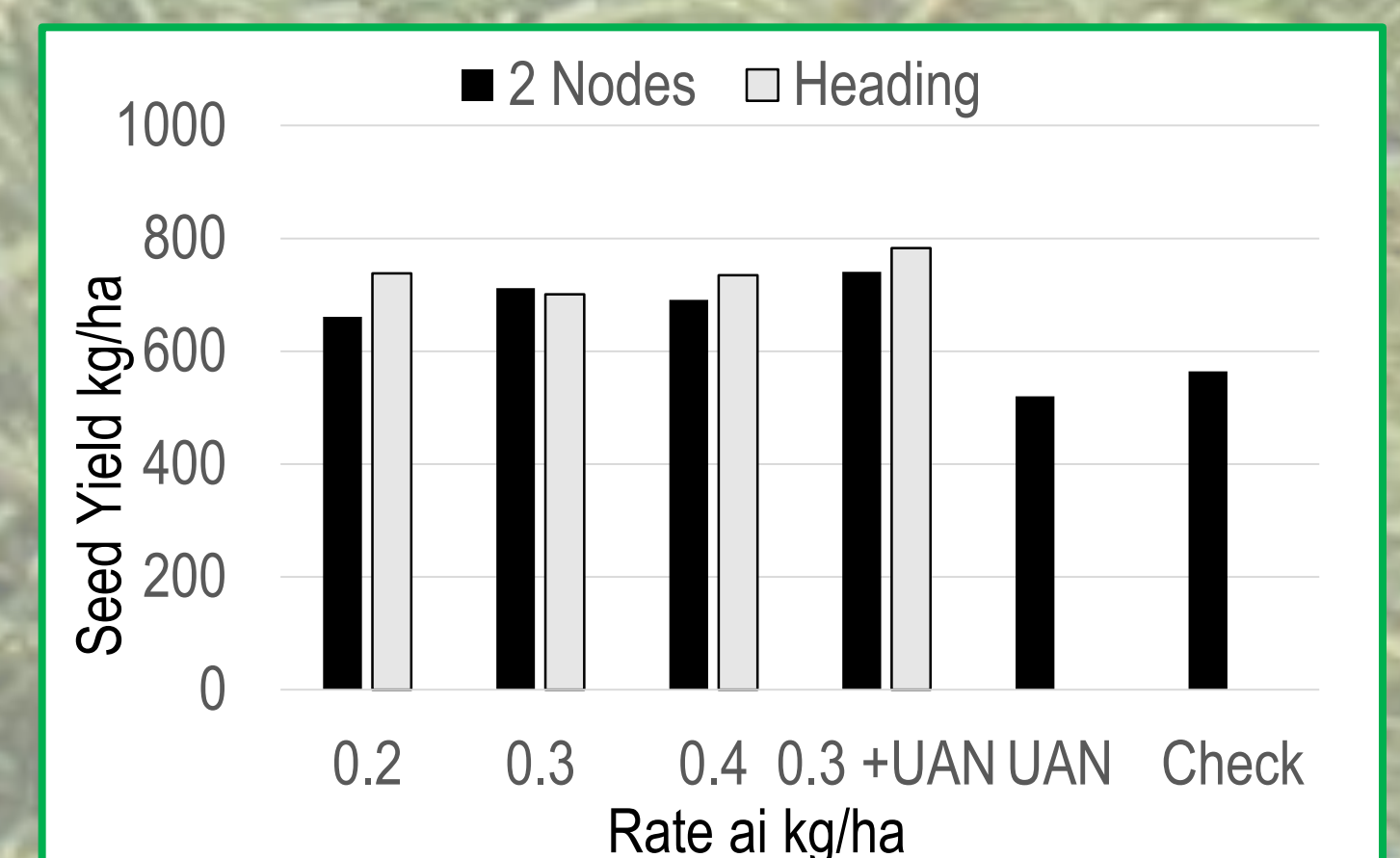
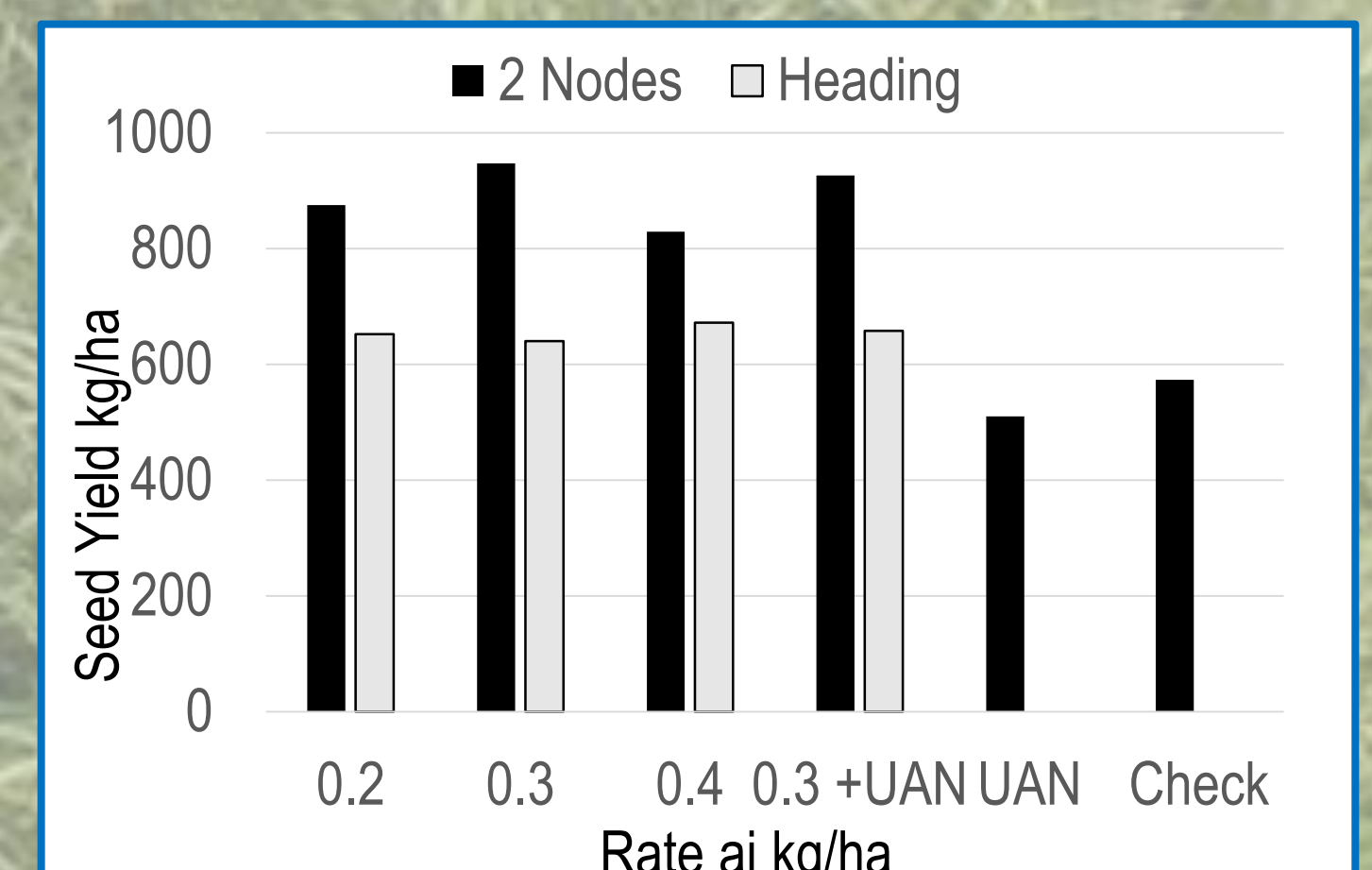
Table 3. Effects of trinexapac-ethyl on a 1st year stand of timothy

Treatment kg ai/ha	Plant Height (cm)		Lodging (0-10)		Seed Yield (kg/ha)		Germination (%)		1000 kwt (g)	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
0.200 at 2 Nodes	115 abc	109 ab	10	10	875 a	661 abc	96.3	99.2	0.483	0.449 ab
0.300 at 2 Nodes	118 abc	107 ab	10	10	947 a	712 abc	94.5	97.7	0.481	0.469 a
0.400 at 2 Nodes	95 d	107 ab	10	10	829 a	691 abc	96.5	97.5	0.477	0.478 a
0.200 at Heading	120 abc	110 a	10	10	652 b	738 ab	95.5	98.0	0.477	0.455 ab
0.300 at Heading	105 cd	102 b	10	10	640 b	701 ab	95.0	97.5	0.467	0.460 a
0.400 at Heading	109 bcd	105 ab	10	10	672 b	735 ab	92.8	98.5	0.457	0.464 a
0.300 at 2 Nodes + UAN	105 cd	110 a	10	10	926 a	741 ab	94.8	98.5	0.493	0.477 a
0.300 at Heading + UAN	111 a -d	104 ab	10	10	658 b	783 a	96.0	98.2	0.483	0.479 a
UAN	120 a	111 a	10	6.0	510 c	520 c	97.3	98.2	0.457	0.408 b
Check	128 ab	112 a	10	7.2	573 bc	564 bc	96.0	98.7	0.456	0.450 ab
CV%	7.8	3.1			8.7	13.0	2.1	0.40	4.1	5.3
LSD (P=.05)	12.8	5			91	130	NSD	NSD	NSD	0.036

Table 4. Effects of trinexapac-ethyl on a 2nd year stand of timothy

Treatment kg ai/ha	Plant Height (cm) July 4 th	Seed Yield (kg/ha)	Germination (%)	1000 kwt (g)
0.200 at 2 Nodes	108 cd	774	92.9	1.196
0.300 at 2 Nodes	109 cd	836	91.8	1.216
0.400 at 2 Nodes	90 e	732	93.4	1.221
0.200 at Heading	106 cd	742	88.6	1.187
0.300 at Heading	104 cd	798	93.3	1.223
0.400 at Heading	101 d	747	92.3	1.210
0.300 at 2 Nodes + UAN	102 d	822	93.8	1.209
0.300 at Heading + UAN	116 bc	811	91.2	1.204
UAN	123 ab	706	86.6	1.207
Check	130 a	664	95.3	1.236
CV%	5.9	10.6	5.9	4.9
LSD (P=.05)	9.4	NSD	NSD	NSD

Table 5, 6 & 7 (right). Effects of trinexapac-ethyl on seed yields of 1st year stands (blue & green) and a 2nd year stand (orange) of timothy, Beaverlodge 2016



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