In 2017 MFSA continued its research into the use of plant growth regulators in Perennial ryegrass and other grass crops. This has been part of a 3 year project conducted in the 3 western prairie provinces of Manitoba, Saskatchewan and Alberta with hopes of attaining a label expansion with a suitable growth regulator. This year MFSA conducted an in depth trial with perennial ryegrass and some screening trials with Timothy, Hybrid Brome and Tall Fescue.

**Strip Trial Methodology:**

Since this was a strip trial, we conducted these in farmers existing seed fields with the plot size being the entire length of the farmer’s field and one pass width of the producer’s field sprayer. Height and lodging ratings were taken at random from within the sprayed areas and from an untreated check strip outside of the sprayed area. Swathing and harvest was done by the producer with conventional farm equipment and yield weights from individual swaths were taken with the use of a weigh wagon. Plant heights, lodging, moisture, yield weigh, percent dockage and thousand kernel weight measurements were obtained from the trail areas. It should be noted that the screening trial was not randomized or replicated and therefore could not be statistically analyzed, so the info gathered should be taken as observational info to support further scientific testing. However, there were definite trends that were seen within all the grass seed crops investigated.

This year 2 plant growth regulators chosen for testing, Parlay (Trinexapac-ethy, application rate of .7L/ac) and Apogee (Prohexadione calcium, application rate of 41 grams per acre) and applications were made at the GS32 or 2\textsuperscript{nd} node stage and prior to heading.
**Tall Fescue**

The 2 locations chosen for this crop were in Minnedossa (Western MB) and Dugald (Eastern MB). Both had their own limitations but produced similar data. The Dugald location was cool and dry in the spring resulting in delayed plant growth, and a very short application window. Application was made during a time of stress with short plant heights and a thin stand.

Table 1

![Tall Fescue Plant Heights-Oakbank](image)

As seen in table 1, the application did not result in a significant difference in plant heights. This may be attributed to the poor start the field had in the spring and the dry summer conditions, however we did see

Table 2

![Tall fescue Yield (kg/plot) - Oakbank](image)
an increase in seed yield weigh (table 2) with the Parlay treatment at 882kg over the untreated check at 752kg. The Apogee treatment had a minimal response at 757kg and would not be considered significant over the untreated check area.

Minnedossa did also see a reduction in plant height with both the Parlay and Apogee treatment over the untreated check by 13-14%. Yield increases were also seen with both treatments; however the Parlay only produced a 6% increase and the Apogee 8.6% increase. This producer had also included an increased fertility strip in the trial which produced an increased in seed yield by 14%, without significantly increasing plant height with the Parlay treatment.

Table 1

Table 2
Timothy

A Timothy strip trial was conducted in Teulon (Central MB) with the same treatments as the Tall Fescue. This trial also resulted in the Apogee and Parlay treatment decreasing plant heights, over the untreated check by 4.2% with Parlay and 6.3% with the Apogee. As seen in other grasses, seed yield has been increased by the applications with Parlay yielding 18% over the untreated check, and Apogee yielding 8.6% over the untreated check.

Table 1
Hybrid Brome

There were 2 trials conducted with this crop, one in Teulon (central MB) and one in Minnedossa (western MB). The Teulon trial was recorded and taken to yield but due to inconsistencies in the field the data could not be used. The Minnedossa trial produced very good results and as seen in other grass crop produced higher yield weights and shorter plant heights. The Parlay treatment produced higher yields at 494kg/ha over the untreated check at 445kg/ha, as well as reduced plant heights at 119cm. The Apogee treatment was not as successful in raising yields over the untreated with only a 2% increase in yield and a height reduction of 6.3%. The added fertility portion of the trial showed the shortest plant height and a reduced yield over the regular parlay treatment, which may be contributed to an anomaly in the field. This is why it is always preferred to substantiate results through replicates.
Table 2

Conclusion

More work will need to be done with these grass species in the future to determine correct rates. As seen in these screening trials, the application of a growth regulator will increase yield, and reduce some lodging, but does not significantly reduce heights in these taller grasses. Higher rates may need to be researched in the future to address the height issue.

Perennial Ryegrass

This trial was part of the 3 year investigating increased fertility in conjunction with varied rates of Parlay. There were 2 different Nitrogen rates applied (135lb/ac N & 150lb/ac N) and 3 different rates of Parlay applied (.5L/ac, .7L/ac & 1.0L/ac). In 2016, a higher rate of Nitrogen at 180 lb/ac had been evaluated against
the rate of 135lb/ac. During that trial it had been determined that the 180 N rate was just too great and had produced lodging in the perennial ryegrass regardless of the rate of Parley. It was with some discussion that the trail was modified to try and reduce the lodging and therefore reduce the rate of Nitrogen to 150lb/ac.

The trials were in producer’s existing fields and were designed in a medium and small plot, replicated complete bloc design. The Perennial ryegrass fields were located in Ste Rose, (north central MB) and in Winnipeg Beach, (Central MB). In both locations part of the fertility had been applied in the previous fall, with the balance applied in the spring. The additional fertility for the 150N rate was also applied during the spring application.

The Ste Rose location was organised as a medium size RCBD trial, and the field operations were done with field scale producer equipment. It was this location that produced the best results as it had good growing conditions and rainfall. The increased fertility treatments showed an increase in both heights and in yields, which would indicate that the 150 lb/ac rate is where producers may want to target their fertility and not the 180 lb/ac rate. The Parlay varied rate treatments, resulted in some interesting results. The .5L/ac treatment had a 6% decrease in plant height in the 150 lb trial and a 10% decrease in the 135 lb section, and both increased yield over the untreated check. The .7L/ac Parlay had the best result of both height reduction and yield increase, in both fertility treatments. There was a 12% yield increase over the untreated in the 135 rate section and a 14% increase in the higher 150 lb fertility portion of the trial. However, the 1.0L/ac treatment reduced the height to the point that it also caused a reduction in yield as compared to the other Parlay treatments. The 1L rate did marginally produce a yield increase over the untreated check. It should be noted that the 150 lb/ac rate of fertility did produce a seed yield increase over all of the 135 lb/ac rates of Nitrogen.

<table>
<thead>
<tr>
<th>TRT</th>
<th>135 N Height (cm)</th>
<th>% Check</th>
<th>150 N Height (cm)</th>
<th>% Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check</td>
<td>54.4</td>
<td>100.00</td>
<td>60.56</td>
<td>100.00</td>
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<tr>
<td>0.5 L/ac</td>
<td>49.1</td>
<td>90.2</td>
<td>57.06</td>
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<tr>
<td>0.7 L/ac</td>
<td>45.3</td>
<td>83.2</td>
<td>53.39</td>
<td>88.1</td>
</tr>
<tr>
<td>1.0 L/ac</td>
<td>37.6</td>
<td>69.1</td>
<td>48.06</td>
<td>79.3</td>
</tr>
</tbody>
</table>
The Winnipeg Beach location was organized as a small plot RCBD as the filed had some inconsistencies that would not allow us to complete a medium scale trial. This location produced similar results to the Ste Rose, however, the fertility treatments did not produce the same yield results.

<table>
<thead>
<tr>
<th>TRT</th>
<th>Height (cm)</th>
<th>% Check</th>
<th>Height (cm)</th>
<th>% Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check</td>
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<td>100</td>
<td>53.8</td>
<td>100</td>
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<tr>
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<td>48.3</td>
<td>89.1</td>
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<tr>
<td>1.0 L/ac</td>
<td>49.7</td>
<td>91.7</td>
<td>45.9</td>
<td>85.3</td>
</tr>
</tbody>
</table>

There was a difference in plant heights from all three Parlay treatments over the untreated in the 135N section, however they were not significantly different from each other. The best yield increase in the 135lb/ac treatment was seen in the .7L/ac application rate which produced a 15.3% increase in yield over the
untreated check. It was noticed that the higher fertility had not significantly increased seed yield, over the lower fertility and this was investigated through soil testing. This site had not seen significant rainfall after the spring fertility was applied, and we summarized that it was due to this lack of moisture that much of the applied nutrient was not utilized by the crop. Thus resulting in the similar yield results observed between the 2 fertilities.

Conclusion

From the data collected over the number of years we have definitely seen an advantage gained in both harvestability and in seed yield from the application of Parlay. The application of added nitrogen in conjunction with a plant growth regulator has also increased seed yield in this crop. However, producers must be aware to first assess their crop stand/vigor, existing fertility and plant staging before making such applications. Timing must be made at the correct stage of growth and your crop should be showing signs of good vigorous growth with the potential to be entering into a productive season for plant growth regulators to provide their best results.

The Manitoba Forage Seed Assoc. will be working on further research with plant growth regulators on other grass species in the upcoming years and hope to provide more information to grass seed growers in the future.

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