Plant Growth Regulator Timing Evaluation

Roger Burak, Dip Ag
MFSA Research Manager

Plant Growth regulators have been studied for a number of years specific to grass seed crops and the yield benefits that can be achieved. It has been the focus of the MFSA in the past few years to conduct research with Parlay (Trinexapac – ethyl 11.3%), on perennial ryegrass to determine the correct application timing and optimal application rate. Through this research we have derived this to be .7L/ac at the two node stage. However, growers have questioned if there would be a significant yield decrease if there was an early or late application. As stated by Nicole Anderson from Oregon State University, you want to have the plant standing tall and able to have optimal pollination, and lodging does not allow this to happen.

This year MFSA began a 3-year project to help answer the timing question. Two fields were chosen for the study: one located in Stonewall and the second in the Arborg area. The trial was set up as a three rep medium size plot study with each plot measuring approximately one acre in size. Applications were made at 1st node stage prior to 2nd node emergence, three days after 2nd node emergence and seven days after 2nd node emergence. Height ratings were taken every seven days from designated areas within each plot, and it was agreed that the producer would harvest a section of each plot with regular farming equipment. The yield from each plot was then weighed in a weigh wagon and subsamples taken for later analysis of TKW, moisture and approximate dockage.

Applications were made at 1st node prior to 2nd node emergence, at 2nd node emergence three days after and seven days after 2nd node. The multiple applications were made with a tractor mounted 30 ft wide sprayer with a total of a 60 ft width being sprayed for each plot. Height ratings were taken every seven days from designated areas within each plot, and it was agreed that the producer would harvest a section of each plot with regular farming equipment. The yield from each plot was then weighed in a weigh wagon and subsamples taken for later analysis of TKW, moisture and approximate dockage.

Conditions at both sites were varied with Stonewall first seeing very dry soil and delayed plant growth early in the spring, while the Arborg site had ample moisture early and dry conditions later in the summer. Nutrient levels were not an issue at either site with fertilizer application made in the fall and topped up in the spring. Plant populations were also very good with little winter kill at the trial sites. The dry conditions were a concern and some industry agronomists were concerned that the reduction in plant height and the lack of moisture may have a severe effect on yield achieved.

Results

As seen in the height graphs, both locations had an effect from the application of Parlay on the perennial ryegrass over the untreated, regardless of what timing was sprayed. It can also be seen that plant heights also peaked out in the last week of June to the first week of July. However, the one statement that seems to be consistent over
both sites was the consistently reduced height seen in the on time 2nd node treatment. Both the early and the late treatments had reduced heights over the untreated but it was the on time that showed a 16% reduction at Arborg and a 29% reduction in height at Stonewall.

The main focus of this trial was to investigate any yield reductions from early or late application. Yield weights were taken from each plot, and subsamples were taken back for analysis. The subsamples were cleaned to remove any light material along with any trash that may affect yield weights of a clean sample, and moistures were also determined and weights adjusted to a dry sample moisture.

From the data collected we have seen contradicting results which may be attributed to the drought conditions experienced by the crop in the growing season. It can be noted that when the results are run through our analytical software we have no significant differences between the treatments; however, you can see from the yield means that there is a slight measurable correlation between the treatments and the yields received. The data does not lend itself to make a conclusion as we have differing results from both sites. At Stonewall and Arborg the untreated checks produced a slightly more favourable yield over most of the treatments, which is most uncommon in previous data we have seen. It is due to these results that we can only deduce that the application may have had a slight detrimental effect on yield when applied during these dry conditions.

For plant growth regulators to work most effectively you need all of the growing factors to be present which include fertility, ample moisture, correct timing, correct application rates and favourable weather. It can be seen that even though we had a reduction in heights, that did not translate to yield benefit due to the shortage of moisture to help the plants produce the optimal yield. As stated earlier, this is part of a three year project and we hope to continue to explore this in the upcoming years and provide a more definite answer to the application timing question.