Acceleron® Seed Applied Solutions with NemaStrike™ Technology for Control of Nematodes

Through the years, parasitic nematodes have been the cause for yield losses of greater than 10% in each of the three core United States crops: corn, soybean, and cotton.¹ Microscopic nematodes pierce plant roots, which can help facilitate plant bacterial, fungal, and viral infections.

Nematode damage is frequently underestimated and misattributed to stresses associated with drought, fertility, chemical injury, and disease. Symptoms may not be visible or appear as wilting, yellowing, or stunting. The presence of nematode species can vary based on environmental conditions, soil type, and the presence or absence of actively growing plants that support their life cycle. Yield loss attributed to nematodes has been estimated at 10.2% for corn, 10.6% in soybean, and 10.7% in cotton.¹

Nematodes are able to enter fields through soil movement including the wind, shovels, boots, farm machinery, and animals. It has been estimated through sampling that over 80% of U.S. corn acres are infested with at least one species of nematode.²

Crop protection has primarily been limited to crop rotation, use of resistant soybean products, and available nematicides. However, the EPA recently approved the use of NemaStrike™ Technology, a seed treatment technology that provides broad-spectrum nematode control for soybean (Figure 1), corn (Figure 2), and cotton crops. Some of the nematodes controlled include soybean cyst, root knot, lesion, lance, reniform, sting, and needle.

NemaStrike™ Technology has been approved for use in Illinois and Indiana. With a novel mode of action, low water solubility, and new chemistry (Tioxazafen), NemaStrike™ Technology defends crops from the start and stays in the root zone as plants grow for up to 75 days. In numerous field trials over 3 years, the technology has helped to protect the average yields of corn by 7 bu/acre (100 trials), soybean by 3 bu/acre (113 trials), and cotton by 80 lbs lint/acre (51 trials).³ Performance results will vary based on nematode pressure.

Acceleron® Seed Applied Solutions with NemaStrike™ Technology will be offered to Asgrow® and DEKALB® brand seed purchasers. Please contact your Asgrow and DEKALB brand seed providers for additional information.

Sources:
2 AgriThority. 2016 nematode sampling study conducted in the U.S. Corn Belt
3 Results of three-year field trials across all locations and thresholds (2014, 2015 and 2016) vs. competitive standard.
Late-Planted Corn Can Mature Earlier Than Expected

Because of April and May rainfall, corn planting was delayed in areas of Central and Northern Illinois. However, late-planted corn can mature reasonably close to earlier planted corn.

Late planting of a full-season corn product does not necessarily result in its maturity being greatly delayed. Research has demonstrated that as planting is delayed, the growing degree units (GDUs) required for an individual corn product’s maturity decreases. Corn generally requires 1.6 and 6.8 GDUs less for each day beyond May 1 to reach flowering and physiological maturity (black layer, Figure 1), respectively.1 Therefore, corn planted in late May compared to an optimum date may take 110 to 210 fewer GDUs to reach black layer.

As an example, Table 1 provides average available growing season GDU accumulations for various planting dates to average first frost (32 °F) for several Central and Northern Illinois locations. If a full-season 2700 GDU product was planted the week of May 25 in the Galesburg area, it has the potential to reach black layer because its black layer rating is below the 2723 potential. Additionally, a product with a GDU to black layer rating of 2800, planted on May 25, should only require 2637 GDUs to black layer [2800 GDU requirement—(6.8 GDUs less/day X 24 days)]. With this information, a late-planted full-season corn product may not necessarily vary greatly in moisture content compared to the same product planted during a “normal” planting period. The numbers provided are based averages and should only be used as a reference.

Often, it is beneficial to stay with a full season corn product because the yield potential of a full season product may outweigh the benefit of switching to an earlier product that may provide drier grain. Reviewing long term averages and future forecasts for late planting information can help determine what maturity to select. There have been slow to accumulate GDU growing seasons because of cooler than normal summer-time temperatures such as in 2009 (Table 2); however, that is usually not the case. As an example, from April 27 to May 15 at Rockford, an average of 6.9 GDUs accumulate per day. That increases to 15.0 per day for the period May 16 to June 15, 22.2 per day for June 16 to July 15, 23.2 per day for July 16 to August 15, and then decreases to 19.2 per day for August 16 to September 15 (Table 2).

**Table 1. Average GDU accumulation from various planting dates to average first frost (32 °F) dates in various locations in Central & Northern Illinois.**

<table>
<thead>
<tr>
<th>Planting Date</th>
<th>Springfield</th>
<th>Galesburg</th>
<th>Kankakee</th>
<th>Ottawa</th>
<th>Rockford</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 27</td>
<td>3293</td>
<td>2993</td>
<td>3019</td>
<td>3016</td>
<td>2806</td>
</tr>
<tr>
<td>May 4</td>
<td>3232</td>
<td>2949</td>
<td>2978</td>
<td>2970</td>
<td>2771</td>
</tr>
<tr>
<td>May 11</td>
<td>3155</td>
<td>2889</td>
<td>2921</td>
<td>2908</td>
<td>2720</td>
</tr>
<tr>
<td>May 18</td>
<td>3063</td>
<td>2814</td>
<td>2848</td>
<td>2832</td>
<td>2653</td>
</tr>
<tr>
<td>May 25</td>
<td>2956</td>
<td>2723</td>
<td>2759</td>
<td>2740</td>
<td>2571</td>
</tr>
<tr>
<td>Frost (32 °F)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

GDU Base temperature of 50 °F. Ceiling temperature 86 °F. (30-year average for GDUs); Freeze dates based on 1951-1980 data.

<table>
<thead>
<tr>
<th>Growing Season Time Periods</th>
<th>Long-Term Average</th>
<th>Long-Term Average per Day</th>
<th>2009 Accumulation</th>
<th>2009 Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 27 to May 15</td>
<td>132.0</td>
<td>6.9</td>
<td>137.0</td>
<td>5.0</td>
</tr>
<tr>
<td>May 16 to June 15</td>
<td>466.5</td>
<td>15.0</td>
<td>373.5</td>
<td>-93.0</td>
</tr>
<tr>
<td>June 16 to July 15</td>
<td>689.0</td>
<td>22.2</td>
<td>621.5</td>
<td>-67.5</td>
</tr>
<tr>
<td>July 16 to August 15</td>
<td>719.0</td>
<td>23.2</td>
<td>595.5</td>
<td>-123.5</td>
</tr>
<tr>
<td>August 16 to September 15</td>
<td>595.0</td>
<td>19.2</td>
<td>477.0</td>
<td>-118.0</td>
</tr>
</tbody>
</table>

GDU Base temperature of 50 °F. Ceiling temperature 86 °F.

**Sources:**


---

Figure 1. Kernel showing black layer.
Nitrogen Availability

The availability of residual, fall, and spring applied nitrogen (N) is a concern for some farmers because of the amount of April and May rainfall. Corn plants that are now showing N stress should be evaluated for compaction and possible water shortage stress.

There is debate among agronomists whether fall or spring applied N was lost because of the amount of spring-time precipitation. Farmers who used an N inhibitor with fall applied anhydrous should have benefited from its use.

The University of Illinois has indicated that according to their sampling, most of the applied N remains available. However, N stress may be appearing in some fields as a result of ponding, compaction, or dry soils. In each of these situations N may be available, but plant uptake is hindered by poor root growth and/or lack of water to facilitate N uptake.

One means of evaluation is the utilization of Climate FieldView™ N monitoring offered by The Climate Corporation. The program continually collects environmental information such as rainfall and temperature on each field. Anhydrous application dates can then be input into the system and N loss estimated based on the environmental information.

Another method to help estimate the amount of N loss due to rainfall or flooding is soil sampling. However, soil sampling is likely too late for this year’s crop unless the field was planted very late. Sampling procedures are available from the University of Illinois or Purdue University.

Results indicating substantial levels of soil NH₄ are more likely if NH₄ was recently applied, N stabilizers were used, or soil pH is 5.5 or less. In such cases, low levels of soil NO₃ may mean that little conversion of NH₄ to NO₃ occurred rather than loss of NO₃ from the soil due to leaching or denitrification.

For future years or late-planted corn, the pre-plant soil nitrate test (FPNT) and the pre-sidedress soil nitrate test (PSNT) can be used to help determine NO₃ concentrations in soils. This makes it possible to predict the amount of N that may be available to plants during the growing season through mineralization. Most N is released from the soil in the spring when temperatures increase. The rate N is released from soils is influenced by soil temperature, moisture, and aeration.

Sampling for the PSNT should occur when corn plants are 6 to 12 inches tall or in late May to early June. Soil cores should be taken at a depth of 12-inches with one sample containing 15 to 20 cores. Samples should come from field areas that are similar and no more than 10 to 20 acres in size. Fields that are likely to have high NO₃ concentrations (manure applications, previous year in alfalfa, fine-textured, fall-tilled, south-facing slopes) should be sampled. Although some differences exist in university recommendations for interpreting PSNT results, a general rule of thumb is that if soil test results are over 23 to 25 ppm, additional N is probably not needed.

Summary

Some fields may be short on N depending on how much water passed through the soil (Figure 1). However, monitoring and sampling methods should be utilized to help determine if additional N would be beneficial to help maintain yield potential. Availability is influenced by many factors, but a study from the University of Wisconsin found that “regardless of the rate or source, the fate of fall- and spring-applied N is mostly impacted by weather conditions in early spring”.

Sources


Other Sources:

Web sources verified 6/23/17. 170623093716

Figure 1. Nitrogen deficiency symptom on mature corn leaf.
Current News and Updates

Dry weather in early June allowed planting to be completed except for excessively wet bottom ground and double crop acres. With varied planting dates across the region and possibly within fields, scouting should be underway for weed growth, insect feeding, and disease development.

In general, herbicide applications for corn should be nearly complete for this growing season. However, rescue applications may remain for late-planted and re-planted fields. Rescue treatments should be applied in corn prior to weeds reaching a height of 2-inches. Weeds in soybean fields should be controlled before a height of 4-inches.

It is important to read labels closely to determine the maximum crop growth stage for a herbicide application as crop injury can occur. Additionally, as time passes, future crops must be considered as a late herbicide application could potentially carryover into the next year and result in injury to the following crop. The label for each product indicates how the growth stage is defined, such as free-standing plant height or number of leaves with leaf collars showing.

As corn plants reach the silking stage, silk-feeding insects such as corn rootworm (CRW) and Japanese (JB) beetles may be of concern. Fields should be scouted to determine if feeding is occurring, silking stage, field relationship to other fields in terms of planting date, and the number of beetles present. Thresholds for potential treatment can vary depending on the factors just mentioned. If plants are stressed from drought and/or heat, 5 CRW beetles/plant may be the threshold. If the growing season is favorable and silks are continuing to grow, then 15 CRW beetles/plant may be the threshold. An accepted threshold for JB is 3 beetles/ear, silks have been clipped to 1/2-inch, and pollination is < 50% complete.

Fungicide applications should also be considered during the next few weeks. Fungicides can help protect corn, soybean, and other crops from labeled diseases when applications are applied according to label. The disease resistance of individual seed products should be reviewed prior to fungicide applications as the seed product may have considerable tolerance/resistance for a particular disease. For instance, if grey leaf spot (GLS) is a concern for corn planted in a bottom and it has GLS resistance, then a fungicide may not be necessary. However, other diseases that the product does not have tolerance/resistance too may also be occurring and could potentially benefit from a timely fungicide application.

For additional information on these topics, please contact your Asgrow® and DEKALB® brands seed dealers.

Source:
