CROP NOTES for July 23, 2018
Iowa State University Extension Information for Northeast Iowa
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CORN
Growth and Development
For corn not yet to VT stage, they develop a new leaf every 56 GDD (about every 2.5 days). For corn at VT-R1 stage, maximum plant height is reached, but root expansion continues until R3 stage. The primary ear is usually at node 13 of the plant with most plants having 19 to 20 leaves, although the first 5 or so leaves are usually no longer present.

For a map of current GDD, go to: http://mesonet.agron.iastate.edu/GIS/apps/coop/gsplot.phtml  Current GDD from May 1 is about 1,600 GDD for northeast Iowa. Full season corn in northeast Iowa requires about 2,600 GDD. It takes about 1,400 GDD from planting to R1, and another 1,200 GDD from R1 to maturity (R6). Within
the 1,200 GDD from R1 to maturity, it takes about 650 GDD to reach beginning dent stage (R5) and the next 550 GDD to reach physiological maturity (R6 stage – black layer).

Corn growth & development reproductive stages.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description of stage</th>
<th>Comments</th>
<th>Time to next stage</th>
<th>GDD</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>Silk</td>
<td>Maximum plant height</td>
<td>~ 10 days to R2</td>
<td>220</td>
</tr>
<tr>
<td>R2</td>
<td>Blister (clear liquid in developing kernel)</td>
<td>Maximum vegetative dry matter. Minimal grain dry matter.</td>
<td>~ 8 days to R3</td>
<td>170</td>
</tr>
<tr>
<td>R3</td>
<td>Milk (white liquid in developing kernel)</td>
<td>Outside of kernel is yellow. Starch accumulation increasing.</td>
<td>~ 6 days to R4</td>
<td>125</td>
</tr>
<tr>
<td>R4</td>
<td>Dough</td>
<td>Starch accumulation increasing. Kernel moisture starts decreasing.</td>
<td>~ 7 days to R5 (dent stage)</td>
<td>135</td>
</tr>
</tbody>
</table>

If growing conditions are stressful during R2–R3 stages, we would see yield reductions from loss of kernels (kernel abortion via tipping back of the ears). Once corn reaches the R4 stage, kernel number is established and yield reductions caused by stress would be from a decrease in kernel size.

SOYBEANS

Growth and Development

Soybean growth & development reproductive stages.

A new leaf appears about every 3 days.

The majority of soybeans are R3 stage. Early planted are R4 stage. Later planted at R2, or even just starting to flower.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description of stage</th>
<th>Comments</th>
<th>Time to next stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>Open flower at any node.</td>
<td>Recommended time for foliar applications to control White Mold.</td>
<td>Just a few days to R2 stage.</td>
</tr>
<tr>
<td>R2</td>
<td>Open flower at 1 of the 2 uppermost nodes of the main stem.</td>
<td>Dicamba (HG4) on Xtend soybeans is labeled up to R2 stage. Glyphosate (HG 9) on RR soybeans is labeled through the R2 stage.</td>
<td>About 10 days to R3 stage.</td>
</tr>
<tr>
<td>R3</td>
<td>A pod at least 3/16-inch long at 1 of the 4 uppermost nodes of the main stem with a fully developed leaf.</td>
<td>Most popular stage for foliar fungicide applications other than for White Mold control where R1 stage is recommended, and in some cases R1 + R3 stage applications for White Mold control.</td>
<td>About 9 days to R4 stage.</td>
</tr>
<tr>
<td>R4</td>
<td>A pod a pod at least 3/4-inch long at 1 of the 4 uppermost nodes on the main stem with a fully developed leaf.</td>
<td>Beginning of the most crucial period of plant development in terms of stress influencing seed yield. Rapid and steady dry weight accumulation by the pods.</td>
<td>About 9 days to R5 stage.</td>
</tr>
<tr>
<td>R5</td>
<td>Seeds are 1/8-inch long in the pod at one of the four uppermost nodes on the main stem with a fully developed leaf.</td>
<td>By R5.5 stage, plants obtain max. height, leaf area and node number. Rapid and steady seed dry weight accumulation.</td>
<td>About 15 days to R6 stage.</td>
</tr>
</tbody>
</table>

ALFALFA

Make Plans Now for a “Fall” Alfalfa Seeding

Late summer seeding of alfalfa and other perennial forages should be done in August. Ideally by August 10 in the northern third of Iowa and by August 20 in the central third of Iowa. The following article provides basic
information to successfully establish a forage stand now; [http://www.extension.iastate.edu/CropNews/2010/0719barnhart.htm](http://www.extension.iastate.edu/CropNews/2010/0719barnhart.htm)

Later plantings into late August and even early September often work too, but they are much more dependent on very favorable fall weather. The rule of thumb is to have at least 6 to 8 weeks from emergence to the first killing frost. Planning now for an early August operation optimizes chances of success.

**INSECTS**

**Potato Leafhopper (PLH)**
Continue scouting this pest through August. Scouting and threshold information is provided at: [http://crops.extension.iastate.edu/cropnews/2014/06/managing-potato-leafhoppers-alfalfa](http://crops.extension.iastate.edu/cropnews/2014/06/managing-potato-leafhoppers-alfalfa)

**Japanese Beetles and Other Defoliators**
They and other defoliators need to reach about 20% defoliation in early reproductive stage soybeans to warrant treatment. That refers to the entire plant, not just the upper leaves and not just along the headlands. We almost never see this level of activity. Defoliation charts are available in many resources including this recent article: [https://crops.extension.iastate.edu/cropnews/2018/06/japanese-beetle-adults-emerge-southern-iowa](https://crops.extension.iastate.edu/cropnews/2018/06/japanese-beetle-adults-emerge-southern-iowa). As soybeans reach R4-R5 stages, I could make an argument to lower this threshold to 10% defoliation by comparing it to crop insurance hail charts on defoliation and yield loss. See figure 9 in *Hail on Soybean in Iowa*: [https://store.extension.iastate.edu/product/14792](https://store.extension.iastate.edu/product/14792). Even so, it would be rare for this to occur.

**Silk Clipping by Corn Rootworm and Japanese Beetles**
Later planted corn will be pollinating soon. This later developing corn’s green silks are attractive to already emerged corn rootworm and Japanese beetles. Corn needs at least ½-inch of silks emerged to pollinate. If insects are trimming the silks back more than that, treat ASAP to allow for pollination. However, once pollination has occurred it doesn’t matter if insects feed on silks.

![Corn Rootworm and Japanese Beetles](image)

**Bt-Resistant Western Corn Rootworm**
Once again we are finding Bt-resistance issues in northeast Iowa. Western corn rootworm resistance to multiple corn rootworm Bt-traited corn is being investigated. The most immediate concern with these fields is to be sure that pollination takes place. These fields with poor rootworm control can exhibit very high beetle pressure (photos above and below) which threaten excessive silk clipping before pollination is complete. *If you are having similar problems, I would appreciate a call.*
**Corn Rootworm Larva – Node injury ratings**
Larval feeding generally concludes around mid- to late July. Late July is the typical window for ISU to evaluate its rootworm product trials using the Node-Injury Scale. This one page document from Monsanto has some nice photos of larva injury and a very good description of ISU’s 0-3 node injury scale. [https://www.cornstates.com/News/NewsDocuments/conducting-root-digs-for-corn-rootworm.pdf](https://www.cornstates.com/News/NewsDocuments/conducting-root-digs-for-corn-rootworm.pdf)

**Soybean Aphid**
Weekly trap detections are still very low for Iowa, but some soybean aphids have now been found at each of the northern ISU Research Farms. Field scouting shows higher activity in Minnesota and Wisconsin, but still far below normal. The University of Minnesota provided a news release last week suggesting to begin scouting, since this insects activity can be very spotty. Our threat will be from any migratory move of the winged aphids from Minnesota into our region over the next few weeks. We don’t expect to see much, but again the spotty nature of this pest still means we should scout at least through mid-August. Plus the weather has turned favorable (cooler) for aphid activity. The most immature fields (latest planted) will be the most attractive to the winged soybean aphid migration. The easiest scouting method is to use Speed Scouting. Speed Scouting instructions can be found at: [https://www.ent.iastate.edu/soybeanresearch/files/page/files/2009_speed_scouting_blank_form.pdf](https://www.ent.iastate.edu/soybeanresearch/files/page/files/2009_speed_scouting_blank_form.pdf)

**Bird Cherry-Oat Aphid in Corn**
* I am interested to hear from anyone finding this pest in corn. This has been an extremely spotty insect with most of the hot pockets of activity occurring over the last decade in the counties of Howard, Mitchell, Chickasaw and Clayton. First signs of BCOA in corn is usually in the first week in August on the lower part of corn stalks. If present, the population works its way up the plant over the next 2 to 4 weeks and then naturally dies back. However, damage is done with deposits of honeydew followed by development of a black ‘sooty mold’ on the honeydew that blocks photosynthetic activity of the leaves during grain fill. I mention it now because this insect still has many unknowns, and we are not sure if the insect might initially show up earlier than the ‘early August’ time frame and populate further into September. The insect also appears to be hybrid specific, highly populating some hybrids while not favoring development on others. We do not know why. We also do not know why with some of these high population situations the aphids might be found across the majority of the field or might only affect about 10% of the field. If found early at threatening populations over most of the field (i.e. > 500 per plant average and moving up to the husk), a foliar insecticide application may be warranted. Attached are some photos and population trends of this insect from a research trial in 2012.

**DISEAES**
**Foliar Fungicide Time?**
Foliar applications have begun, but did you scout first. Iowa Soybean Association field trials prove that to just apply without a reason is likely not profitable. They have conducted 537 trials in corn and 505 trials in soybeans over the last 13 years and results showed an average of 3.3 bu./ac. increase in corn and 1.9 bu./ac. increase in
soybeans. On average this is an economic loss. Some applications did much better and some did worse. With scouting and good reasoning you can improve your chance of a positive economic response to only apply fungicides on those fields with a better chance of economic return. Consider the following:

- Crop rotation vs. continuous cropping – Greater chance of disease survival to re-infect with continuous cropping.
- No-till vs. tillage – Most diseases overwinter on crop residue remaining on the surface, thus tillage reduces this cause and effect.
- Field history/record keeping – What has been the prevalence of disease in certain fields in recent years.
- Type of disease and variety/hybrid resistance – What are the various disease ratings from the seed company. You may have selected for High resistance of Northern corn leaf blight (NCLB) because that tends to be our greatest threat in northeast Iowa, but the hot and humid 2018 has been much more favorable for Gray leaf spot (GLS) then for NCLB.
- Climate – Certain diseases only do well in certain climates. *i.e.* This June and July has been just right for GLS and too hot for NCLB. However, Elwynn Taylor said El Nino should start up in August which should mean more moderate temperatures for the rest of the crop season favoring NCLB and Eyespot over GLS development. Thus the back and forth guesswork of treating or not. But consider the other bullet items as well in your decision making process.

Very good resources on corn and soybean diseases are recently updated ISU Extension publications: [https://store.extension.iastate.edu/product/3975](https://store.extension.iastate.edu/product/3975) and [https://store.extension.iastate.edu/product/2940](https://store.extension.iastate.edu/product/2940) They are $5 each. The free on-line route includes a couple of websites providing photos and a short explanation of each disease (description, scouting and management) at: [https://crops.extension.iastate.edu/corn-diseases-symptoms-scouting-and-management](https://crops.extension.iastate.edu/corn-diseases-symptoms-scouting-and-management) and [https://crops.extension.iastate.edu/soybean-diseases-symptoms-scouting-and-management](https://crops.extension.iastate.edu/soybean-diseases-symptoms-scouting-and-management)

**Corn Leaf Diseases**

As fields begin to expose a tassel, it’s a great time to scout for leaf disease. Until recent, it’s basically been too hot for our usual suspects to develop (Common Rust, Northern Corn Leaf Blight, Eyespot). Common Rust rarely causes significant yield loss in field corn in northeast Iowa anyway, but seed production fields are more at risk from this disease. Eyespot is a concern every year and I am finding lesions in the upper canopy in some fields, although it’s not considered as great of a threat as Northern Corn Leaf Blight (NCLB) and Gray Leaf Spot. NCLB is routinely our greatest concern in northeast Iowa, but it’s been largely too hot until now. With the weather cooling back to normal, it becomes more favorable for NCLB. But if the weather cools off, then the threat from Gray Leaf Spot diminishes. However, initial GLS infestations could be worse than usual with favorable weather conditions in June and July, especially along Hwy 20, but also being found in fields as far north as Hwy 9. So scout, but also look up those disease resistance ratings for the hybrids planted.

**Septoria Brown Spot in Soybeans – An easy disease to scout**

This disease appears to some degree every year in every field. It starts in the lower canopy. As long as it does not advance up into the mid-canopy or higher in July, it’s not considered a problem. Scout in July to verify if the disease is spreading beyond the lower canopy. If it is, a foliar fungicide usually applied during around the R3 stage can offer effective control. Here’s photos of the early season disease: [http://iasoybeans.mobi/publications/diseases/foliar/septoria_brown_spot.php](http://iasoybeans.mobi/publications/diseases/foliar/septoria_brown_spot.php) It is sometimes confused with Bacterial blight for which foliar fungicides offer no control: [http://www.soybeanresearchinfo.com/diseases/bacterialblight.html](http://www.soybeanresearchinfo.com/diseases/bacterialblight.html)

**Other Soybean Leaf Diseases**

Northeast Iowa has two particular soybean leaf diseases (Frogeye leaf spot and Cercospora leaf blight) that usually don’t show up (if they show up at all) until R4 stage soybeans. They are not frequent wide-spread disease problems, but under favorable environmental conditions, a foliar fungicide treatment at R4 to early R5 stage can still be timely. Currently, the earliest planted soybeans in 2018 are now R4 stage. Frogeye leaf spot is a bit more prevalent to the south, and Cercospora leaf blight more prevalent to the north. Since you probably
never treated soybean fields much later than R3 stage, if these diseases have caused you problems in the past you should have good evidence of having seen them before (have a field history). If you have good variety resistance, don’t worry about them. Otherwise, scout for early signs of these diseases all the way into mid-August. Here’s some photos and more information about Frogeye leaf spot https://crops.extension.iastate.edu/frogeye-leaf-spot and Cercospora leaf blight https://fvi.uwex.edu/fieldcroppathology/2014/07/23/cercospora-leaf-blight-and-purple-seed-stain-of-soybean/

EVENTS

**July 28, Demonstration Garden Field Day, ISU Northeast Research Farm, Nashua**

4:00 PM start. The event is free and open to the public (rain or shine). The theme for this year is planting the rainbow, with vegetables planted to be donated to nearby food pantries ranging in colors like pink tomatoes, purple snap beans, yellow cauliflower and orange winter squash. Over the past two years, as part of the USDA SNAP-Education program, Iowa Master Gardeners have donated over 20,000 pounds of produce to nearby food pantries. Another part of the demonstration gardens includes an ISU entomologist to discuss planting nectar plants and host plants for bees and other pollinators. For more information, go to: https://www.cals.iastate.edu/news/releases/iowa-state-university-research-farms-host-demonstration-garden-field-days

**July 30, Cattle Handling & BQA Workshop, West Union**

9:30 AM to 1:00 PM with Dr. Tom Noffsinger at the Fayette County Fairgrounds, sponsored by the Fayette County Cattlemen. Proper cattle handling not only is important for the safety of the cattleman, but is also important for the health, growth, efficiency and safety of the cattle. Noffsinger will share the basics of animal behavior and how to utilize that to improve our animal handling. He’ll also demonstrate how to use a Bud Box to work calves through a chute, and achieving cattle flow. Participants will also complete the BQA training. Register in advance by contacting the Benton County Extension office at 319-472-4739. The Fayette County Cattlemen will be providing lunch.

**Aug. 7-27, Farmland Leasing Meetings, many dates & locations across Iowa**

Check the following website for dates, times and locations of upcoming meetings: https://www.extension.iastate.edu/agdm/info/meetings.html

Here is a partial list of most meetings in northeast Iowa:

- Aug. 7, 1:30 pm to 3:30 pm, Tripoli
- Aug. 8, 1:00 pm to 4:00 pm, Charles City
- Aug. 9, 9:00 am to 11:30 am, Manchester
- Aug. 9, 1:30 pm to 4:00 pm, Elkader
- Aug. 14, 1:00 pm to 4:00 pm, New Hampton
- Aug. 15, 1:00 pm to 3:00 pm, Waukon
- Aug. 16, 9:00 am to 12:00 pm, Fayette
- Aug. 16, 1:30 pm to 3:30 pm, Cresco
- Aug. 21, 1:00 pm to 4:00 pm, Epworth
- Aug. 22, 6:00 pm to 9:00 pm, Cedar Rapids
- Aug. 23, 1:30 pm to 4:30 pm, Allison
- Aug. 23, 7:00 pm to 9:00 pm, Grundy Center
- Aug. 27, 1:00 pm to 4:00 pm, Monticello

**Aug. 9, Focus on Nitrogen Field Day, ISU Research Farm, Nashua**

10:00 am to 2:00 pm at the ISU Northeast Research Farm. Farmers and those who advise them are invited to attend “Focus on Nitrogen: Managing Nitrogen for Maximum Profit and Minimum Water Quality Impact.” Being one of the country’s most prestigious water quality research facilities, we will kick off the day with a field tour by Ken Pecinovsky, farm superintendent, which will highlight nitrogen management strategies and water quality testing practices being conducted on the farm. Brian Lang and Terry Basol, ISU agronomists, will discuss the nitrogen fertilizer recommendations for corn, split application of nitrogen, and cover crops as it
pertains to making crop production decisions. The day will conclude with a manure applicator distribution demonstration and nitrogen management discussion (as it relates to manure) by Kapil Arora, ISU ag engineer, and Terry Basol. **Free program, free lunch, free CCA credits.** The program is free and open to the public with lunch provided for those that pre-register. Pre-register at 641-435-4864 to secure a spot. Free CCA credits available. Directions: From Nashua at the Jct. of Hwy 218 (Exit 220) and Co. Rd. B60, go west on B60 1.1 miles to Windfall Ave., then south 1 mile to 290th St., then east 0.2 miles to the farm.

Aug. 21-23, Iowa Drainage School, ISU Northeast Research Farm, Nashua
A 3-day program to train stakeholders in sub-surface drainage concepts, planning and laying out drainage systems including surveying a profile, laying out the system, calculating tile line sizes and spacing using actual field data, making connections, and setting up drainage control structures, NRCS program requirements, and fixing common drainage system issues. It is a combination of hands-on training, lecture and discussion, and problem solving using examples. For more details and registration, go to: http://www.aep.iastate.edu/ids/

Aug. 28, Annie’s Project (*Women’s Farm Management Program*), New Hampton
5:30 PM - 9:00 PM on Aug. 28, Sept. 4, 11, 18, 25, and Oct. 2. Annie’s Project is a six-week program “intended to educate and empower farm women to be better business partners by managing and organizing critical information, improving decision-making skills, and networking with other farm women. The program starts on Aug. 28 in New Hampton at the ISU Extension office. The class meets for six consecutive evenings from 6:00 to 9:00 pm, with a light supper served at 5:30 pm. Registration is $75 for the 18-hour program and includes all materials as well as the light supper. Class size is limited to 25 women. For more information go to: http://www.aep.iastate.edu/womeninag/2018/newhampton.html, and/or contact Val Horner, 641-394-2174, email: vhorner@iastate.edu

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