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## Field Update – Disease Development, Soybean Aphids

A large part of the area received a much needed shot of precipitation last week. While some areas were more fortunate than others, any amount is helpful as the crop progresses through the reproductive stages. A majority of corn is in the blister/early milk stage (R2/R3), while soybeans are starting to form seeds (R4/R5). Daytime temperatures are projected to be closer to “normal” over the next 7 days, which should allow development to continue on track. Central MN is currently averaging 1727 GDUs since May 1<sup>st</sup> and 1528 GDUs since May 21<sup>st</sup>. Overall, GDU accumulation continues to track ahead of normal, which is needed with delayed planted last spring.

| Location         | GDUs Since May 1st | GDUs From Normal- 5/1 | Projected GDUs- 7 Day |
|------------------|--------------------|-----------------------|-----------------------|
| Albany, MN       | 1756               | +171                  | 130                   |
| Wadena, MN       | 1445               | +39                   | 131                   |
| Little Falls, MN | 1702               | +176                  | 130                   |
| Waverly, MN      | 1882               | +160                  | 137                   |
| Belgrade, MN     | 1802               | +187                  | 133                   |
| Cambridge, MN    | 1772               | +133                  | 135                   |
| <b>Average</b>   | <b>1727</b>        | <b>+144</b>           | <b>133</b>            |

\*Data collected from Pioneer.com GDU Calculator 5/1 - 8/7



Disease and insect pressure continue to be top of mind when walking corn and soybean fields the last few weeks. Several new corn diseases observed recently have been holcus spot, eyespot, and northern corn leaf blight. The pressure has been relatively mild in most cases; however, continue to monitor fields for infection as the season progresses. Soybean diseases that have not been observed yet, but could start appearing soon include sudden death syndrome and white mold. Unfortunately, nothing can be done to manage these diseases at this point if they do appear, but is important to know for future management. Lastly, continue to monitor soybean fields for soybean aphids. A majority of fields I walked averaged <50 aphids/plant last week with small pockets having relatively high numbers (250+ aphids/plant). The cool temperatures over the next 7 days may allow for aphid populations to increase rapidly.

## Making Yield- Soybean Yield Components

“August makes yield” is a common phrase in soybeans, which carries a lot of truth. Open flowers, pollinated flowers, pod set, and bean set are all occurring simultaneously in the month of August due to the indeterminate nature of the soybean varieties grown in this region. Therefore, stresses that occur during this period can have a greater yield impact compared to early season stresses. In order to better understand how/when yield is impacted, it is important to understand the various yield components in soybean.

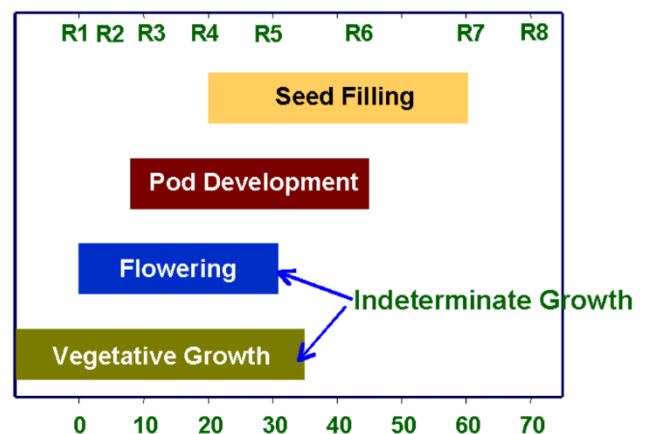
**Plants/Acre:** Ideal plant number per acre can vary depending on planting date. Soybean plants are able to compensate better for fewer plants/acre when planted early compared to late.

**Pods/Plant:** Flowering lasts over a period of 3-5 weeks under good conditions in indeterminate soybeans, before completing during the R5 growth stage. The more flowers that survive = more potential pods.

**Seeds/Pod:** Seed fill begins at the R4 growth stage and is completed by R6. Stressful conditions (specifically moisture stress) can stop seed development. Soybean plants typically average 2.5 seeds/pod.

**Seed Weight:** Seed size is increased between R5-R7. Soybean plants are able to compensate for earlier losses by producing larger seeds if resources become available after R5.

## Soybean Reproductive Development



Indeterminate soybeans continue to develop leaves throughout flowering. Univ. of WI.

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Many soybean fields throughout the region are progressing through R4 and into R5 (beginning seed set). This is a critical period because maximum height, node number, and leaf area are nearly set. Plants at the R4 growth stage are ~45 days from physiological maturity (R7), when yield is no longer impacted. Therefore, minimizing stresses through the month of August is essential in maximizing yield.

## Double Vision- Multiple Ears in Corn

A phenomenon that occurs nearly every year in some corn fields is multiple ears forming on the same corn plant. Modern corn hybrids generally produce one main ear per stalk when grown at optimal plant populations. So, when 2+ ears occur on the same plant, then this can produce questions such as: why does this occur? And more importantly, is there any concern? Ultimately, multiple ears will appear on a corn plant in 2 ways. Let's answer the first question on why multiple ears form:

- 1) One ear on multiple stalk nodes.
  - Hormonal apical dominance in the plant ensures that the uppermost ear shoot fully develops.
  - In areas of the field where plants experience less competition for sunlight and resources, then it is not unusual for a second ear to develop on the node below the primary ear.
- 2) Multiple ears on the same shank (MESS).
  - MESS or "bouquet ear" occurs when multiple ears are formed on the same stalk node. This can look unusual but occurs when the apical dominance has been disrupted and the plant signals to form multiple ears on the same shank as the primary ear.
  - Certain environmental conditions or genetic backgrounds have a higher propensity to form bouquet ears.

The second and more important question: is there concern when you see multiple ears, specifically bouquet ears? In most cases the answer is "no." The reason for concern would be due to drawing resources away from the primary ear and affecting yield. Often, the dominant primary ear will develop and pollinate normally, while the secondary ears are much smaller and cease development after they fail to pollinate. If the primary ear fails to pollinate, then yield can be negatively impacted. The best method to understand whether secondary ears will cause issues is to check pollination of the primary ear. If the primary ear pollinated normally, then yield should not be affected.

