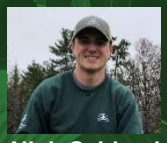
Agronomy Weekly Update

August 16th, 2021



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Field Update- Corn Denting and Soybean Staging

After hitting the halfway point of August, the 2021 weather trend continues with above average temperatures and below average precipitation. The average GDUs accumulated across central and northern MN totals 2062 from an April 26th planting date, which is ~330 GDUs ahead of normal. The fast and furious pace isn't expected to slow down in the week ahead with temperatues >80°F in 5 out of the next 7 days.

Location	GDUs Since April 26th	GDUs From Normal- 4/26	Projected GDUs- 7 Day
Wadena, MN	1915	+406	160
Little Falls, MN	2037	+381	163
Albany, MN	2081	+348	167
Buffalo, MN	2134	+258	175
Glenwood, MN	2155	+365	172
Cambridge, MN	2051	+264	174
Average	**2062**	**+337**	**169**

While walking fields last week, many corn fields were just starting to dent and is expected to reach full dent (R5) within the next week. After corn reaches full dent it takes approximately 400 GDUs to reach black layer (~25 days), which will occur by mid-Sept. in many fields in Central MN if the current weather trend continues. A watch-out over the next 30-45 days is to observe stalks and ear shanks for integrity issues. The corn plant is pulling any and all reserves within the stalk, leaves, and shank to support the developing ear and consequently results in fragile stalks/shanks at harvest. In soybeans, many fields were passing R5 and approaching R6 (full seed in uppermost pods). At this stage, the plant is ~25 days from maturity, which means 30-40 days from harvest. The R6 stage is also the recommended stage to cease insecticide applications to control spider mites. Spider mites continued to flourish last week in the hot and dry conditions; however, fields that are on the threshold "bubble" may have progressed past the point when no treatment is recommended.

Drought conditions continue to intensify and the variability between and within fields cannot be ignored. Silage harvest is approaching and corn/soybean will not be far behind and questions have started to come in regarding yield potential. Yield estimates can provide insight into what can be expected or what fields to go after first, especially with the expected variability this season. Several estimate strategies for corn and soybean are described below.

Denting Corn? Estimating Silage Timing

Have you been noticing kernels starting to dent? As soon as kernels start to dent, the plant needs approximately 450-550 GDUs or ~20-25 days to reach physiological maturity (black layer). Yield loss can occur if premature plant death occurs prior to black layer due to drought, severe disease, killing frost, etc. At early dent (R5) 60-75% of maximum yield for grain has been achieved and 75-85% of maximum yield for corn silage. Once the grain reaches black layer, the total amount of dry weight has been accumulated and 100% max yield reached.

Stage	Days to Maturity	GDU's Until Mature	% of Maximum Yield		Moisture Content (%)	
			Grain	Whole Plant Corn Silage	Grain	Whole Plant Corn Silage
Silk	50-60	1100-1200*	-	50-55	-	80-85
Blister	40-50	900-1000	0-10	55-60	85-95	80-85
Late Milk	30-40	650-750	30-50	65-75	60-80	75-80
Early Dent	20-25	450-550	60-75	75-85	50-55	70-75
Full Dent or ½ kernel milk-line	10-15	200-300	90-95	100	35-40	65-70
Physical Maturity (Black Layer)	0	0	100	95-100	25-35	55-65

Corn development relative to physiological maturity. Lauer, J. 2016.

Storage Structure	Recommended Corn Silage % Moisture
Upright Silo	60-65%
Oxygen Limiting	50-60%
Bunkers and Piles	65-70%
Bags	60-70%
Lauer, J.G. Univ. of WI- Extension.	

While staging silage harvest, both whole plant moisture and kernel milk-line should be monitored. Hybrids with improved late-season plant health can maintain fiber digestibility later into the growing season, while allowing more starch to be accumulated. Starch deposition is a driving factor in reducing whole-plant moisture, while increasing tonnage and energy. Ideal harvest moisture may vary depending on the type of storage structure.

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Free Estimates- How to Calculate Yield Potential

The crop has reached the stage when preliminary yield estimates can be conducted and as we get closer to maturity we can become more confident in the outcome. The 2021 harvest season will be different than most with wide swings in yield between and within fields due to the dry conditions. *It is important to keep in mind that an estimate is indeed an estimate and seed size is still to be determined.* However, conducting yield estimates can help you understand what is out there, where the most potential is located, and help prioritize harvest order.

Grain Corn

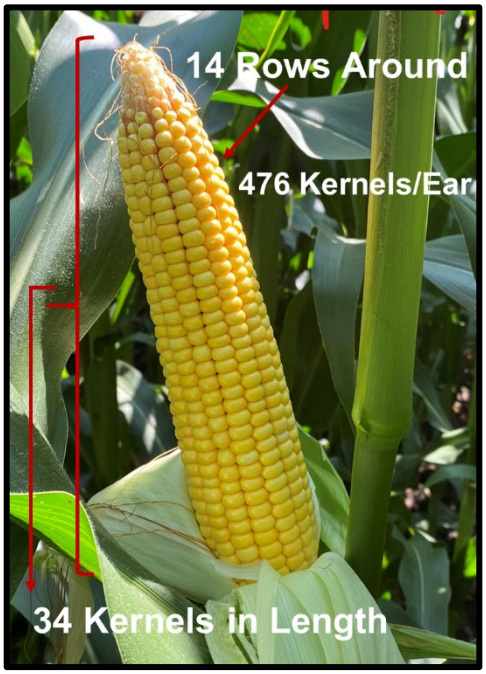
- [((Rows Around x Kernels per Row) x Harvestable Plants in 1/1000th Acre) ÷ Kernels per Bushel].
- A couple caveats:
  - Take the average kernel counts from 3 ears within the 1/1000th acre length.
  - Kernels per bushel can vary and be one of the hardest numbers to determine. Typically, this ranges anywhere from 70-90k/bu. Drought stress will cause smaller kernels and 90k would be a good starting point.

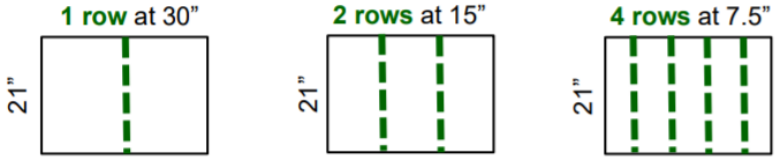
Corn Silage

- Multiple strategies depending on severity of drought stress:
  1. Grain Yield- Estimate potential grain yield (method above). Yields <100 bu/ac- Every 5 bu/ac = 1 ton of silage. Yields >100 bu/ac- Every 7-8 bu/ac = 1 ton of silage. Based on 30% DM.
  2. Plant Height- Plants with little or no grain expected, then each foot = 1 ton at 30% DM.
  3. Sampled Weight- More accurate method is to cut 1/100th an acre of plants and record the weight, then divide by 4.

Soybean

- One of the hardest crops to get an accurate assessment on because of plant to plant variability. Estimates can start at R6 growth stage.
  1. [(Plants/1000th Acre x Pods/Plant x Seeds/Pod) ÷ (Seeds/Pound x 0.06)]. Take the average number of pods from 10 plants within the length. Typical seeds/pod are 2.5; however, seed counts can adjust this. Average seed weight is typically 3000 seeds/lb. 2700 seeds/lb for large seed and 3500 seeds/lb for small seeds (drought stress).
  2. Simplified Version: [(Pods x Seeds/Pod) ÷ Multiplication Factor]. Measure 21" within rows (1/10000th Acre) and count number of plants within that length. In 30" rows count 1 row, 15" rows count 2 rows, and 7.5" rows count 4 rows. Take the average number of pods/plant or count all the pods within this area. Utilize 2.5 as the average seeds/pod or adjust based on counts. Multiplication factor for seed size is listed beow.





Number of rows to count to equal 1/10000th acre.

Seeds Per Pound	Seed Size Factor
2500 (large seed)	**15**
2666	16
2833	17
3000 (normal seed)	**18**
3166	19
3333	20
3500 (small seed)	**21**

Seed size factors. Casteel, S.N. 2012. Purdue Extension.

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