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## Field Update – Crusted Soils and Emergence Success

The largest planting window of the season allowed for tremendous progress across central MN last week. The fine textured soils were still “tacky” to start, but improved greatly by the weekend, while coarse textured soils were in great condition. The forecast is calling for high probabilities of rain mid-week, but warm temperatures should follow as we head into memorial weekend. Growing degree unit accumulation across the region has averaged ~216 GDUs since May 1<sup>st</sup>, which is slightly ahead of normal. We have officially received enough heat for corn and soybean emergence in fields planted within the first 10 days of May. It takes about 110-120 GDUs on average for corn emergence and 90-130 GDUs for soybean.

Location	GDUs Since May 1st	GDUs From Normal- 5/1	Projected GDUs- 7 Day
Albany, MN	237	+51	76
Wadena, MN	153	-4	68
Little Falls, MN	209	+29	76
Waverly, MN	245	+52	84
Belgrade, MN	215	+24	79
Cambridge, MN	235	+41	75
<b>Average</b>	<b>216</b>	<b>+32</b>	<b>76</b>

\*Data collected from Pioneer.com GDU Calculator



The biggest concern while walking fields recently has been soil crusting impacting emergence in fields that were planted prior to the heavy rain we received mid-May. The scenarios I have observed with the greatest impact has been in fine textured soils that were conventionally tilled. Coarse textured soils naturally did not crust, but had more issues with large washout areas. The 2 main take-a-ways in these situations have been: 1) If fields were not rotary hoed already, then it is likely too late to save any remaining plants trapped beneath the soil surface due to “leafing out” underground. 2) Water that ran down the furrow on hillsides resulted in seed on top of the ground or gone completely and will need to be replanted, while water that ran perpendicular had minor impact. *The best action that can be taken in either scenario is to take stand assessments in order to make a replant decision.*

## Discolored Corn- What is the Cause?

The 2022 growing season is shaping up to be unique and emergence will be spread out due to the wide planting window. As we approach the end of May, crop progress has ranged anywhere from freshly planted to corn approaching the V2 growth stage. However, a common theme has been discolored plants while walking corn fields recently, which has had many questioning the healthiness of these plants. Typically, this discoloration has little impact on overall yield and is a result of the recent weather trends. Below are several explanations for different colorations:

- **Yellow** - Weather related stresses can slow photosynthetic activity and overall vegetative and root growth. The primary reason for the response this season is due to the cool temperatures and saturated soils, which creates a “cross-banded” appearance.
- **Purple** - Cold nighttime temperatures that are preceded by warm daytime temps can trigger an accumulation of anthocyanin pigment in corn leaves. This most commonly occurs in young corn plants and may be more apparent in specific corn hybrids.
- **Brown** - Brown tissue is the result of dead tissue from some external force (weather, insects, disease) and should be the most concerning. Further inspection will be needed to determine the cause since yield can be impacted due to reduced stands.



## Contemplating Replant Scenarios

Corn and soybeans are still being planted across the region so it may seem early to talk about replant. However, fields that were planted early may have struggled to emerge due to soil crusting, waterlogged soils, or washouts. Several factors need to be considered when contemplating replant including yield potential of original stand and associated costs with replanting. Unfortunately, replant decisions are not always simple answers, but a few reasons are suggested below to help guide a decision:

- 1) Original Planting Date vs. Replant Date
  - a. Yield potential is not always greatest in the earliest planted fields, but typically yield tends to decrease every day planting is delayed beyond May 1<sup>st</sup> in MN. *Example: The yield potential of a full stand of 35k on May 9<sup>th</sup> is 93%, while a full stand of 35k on May 29<sup>th</sup> is 78%.*
- 2) Remaining Stand vs. Replanted Stand
  - a. A low stand may still result in higher yield potential compared to a full stand planted late. Typically- the min. threshold for corn stands is ~20-22k and <60k in soybean fields planted early. *Example: A stand of 20k planted on May 9<sup>th</sup> has about the same yield potential of a full stand of 30k planted on May 29<sup>th</sup> (~77%).*
- 3) Stand Uniformity
  - a. Yield will be impacted from an uneven stand due to a competitive advantage for early emerged plants. An uneven stand is often the hardest to make a decision, but gather a comprehensive understanding of emerged plants in high to low areas to help differentiate where replant may be most effective.
- 4) Other Considerations: Patching in vs. completely starting over. If patching in, then stands need to have <25% of original stand. Overall health of plants and management of replant areas (tillage, replacement hybrid, fertility, herbicide) should also be considered.

Planting Date	Yield as Percent of Normal	
	Mid-season Variety	Full-season Variety
May 20	100	100
May 30	96	94
June 10	92	90
June 20	82	78
June 30	70	NR
July 10	60	NR

  

Population Plants/Acre	Yield as Percent of Normal	
	Drill (7.5-inch rows)	Planter (30 inch rows)
160,000	100	100
120,000	100	100
80,000	96	100
60,000	92	94
40,000	87	88
20,000	77	81
10,000	58	72

*Estimated soybean yield potential by planting date and plant population. Adapted from Purdue Extension publication ID-179, Corn & Soybean Field Guide.*

Planting Date	Plant Population (1000 plants/acre)						
	10	15	20	25	30	35	40
----- % of maximum yield -----							
April 1	54	68	78	88	95	99	99
April 10	57	70	81	91	97	100	100
April 20	58	71	81	91	97	100	99
April 30	58	70	80	89	95	97	96
May 9	55	68	77	86	91	93	91
May 19	50	63	72	80	85	86	84
May 29	44	56	65	73	77	78	75
June 8	35	47	56	63	67	67	64

*Yield potential based on planting date and plant population. Nafziger, E., et al. Univ of Illinois.*

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