

BREANNE REY 204.361.5549 brey@prideseed.com @breannerey SARA MEIDLINGER 519.917.2225 smeidlinger@prideseed.com ☞ @meidlinger09

# **Evaluating Plant Emergence**

Corn planting progress across Western Canada is quite scattered due to late April snowstorms and large amounts of rain in parts of Manitoba and Eastern Saskatchewan. These weather conditions can affect corn emergence and ultimately yield. In any given conditions, understanding and evaluating corn emergence is critical. This newsletter will explain reasons for poor emergence and how we can try to avoid it and track it this spring.

## WHY IS EMERGENCE IN CORN SO IMPORTANT?

Simply put, corn is a poor competitor with other corn plants (weeds too, but we will leave that topic for another day). Plants that emerge within 48 hours of each other are close enough in staging and development that they will not compete very much, if any, against each other. The problem happens when plants emerge outside of that 48-hour time frame. These late emerging plants tend to lag in staging and development to the plants that emerged in a timely fashion. Competition from the larger, first emerging plants reduces the yield of the smaller, late emerging plants.

# **REASONS FOR POOR OR UNEVEN EMERGENCE**

## 1. Lack of Soil Moisture or Soil Moisture Variability

• Water is critical for germination, without water germination can not happen. Lack of soil moisture or uneven moisture at the planting depth can occur throughout the field due to soil variability. Seeds planted into dry soils will wait to germinate until after a rainfall event occurs. Light rainfall events following planting into a dry seedbed can cause uneven germination leading to uneven emergence.

## 2. Uneven Soil Temperature or Cold Temperatures

- Fields with heavy residue or heavy residue pockets throughout the field can have uneven soil temperatures cooler soil temperatures in the areas with heavy residue.
- Cold soil temperatures usually means cold soil water. When the seed imbibes cold soil moisture, it's like a "shock to the system" and can result in imbibitional chilling injury or a corkscrewing effect of the mesocotyl depending on when the cold temperatures are experienced by the seed.

## 3. Soil Crusting

• Crusted soil surfaces can restrict the emergence of the coleoptile and can result in the seedling leafing out underground.

## 4. Disease Injury

Seedling blights and root rots are the diseases that are commonly observed at this point in the season. Seed treatments offer protection against blights and root rots, but they only last so long.

## 5. Planting Depth or Uneven Planting Depth

• Target 2" (1.5" to 2.5") planting depth for corn. Emergence problems tend to arise when corn seed is planted deeper than 2.5" (colder soils, moisture may be less uniform, etc.).

## 6. Insect Injury

 Wireworms and seed corn maggots are common insect pests that can feed on seeds in furrow and cause damage that results in reduced emergence. PRIDE Seeds corn hybrid seed is treated with an insecticide (Fortenza®), but infields/areas with high insect pressure, seed treatments can only do so much.

## 7. Herbicide Injury

• This is when reviewing herbicide records of the field can be extremely helpful. Using records, you should be able to find out to what extent the herbicide damage is and make the appropriate decisions. There are often other factors contributing to herbicide injury (poor rainfall, low soil moisture, cold temperatures) in corn during emergence, but not always.

# KEEPING INFORMED

**MAY 2022** 

## **AVOIDING UNEVEN EMERGENCE**

#### 1. Use Tillage When Appropriate

- Avoid excess tillage which can dry out or compact the seed bed
- Tilling wet soils can result in clumpy soils that can cause poor planter performance (uneven spacing within the row and/or uneven depth)

## 2. Monitor Seed Placement During Planting

- Check on the seed to soil contact and depth uniformity
- Make adjustments to the planter accordingly

## 3. Check the Soil Temperature

- 10°C is the soil temperature you're looking for before planting your corn
- When temperatures are below 10°C, there is an increased risk of cold injury which can result in failed emergence or poor plant vigour once emerged

## 4. Check planter performance

- You may have uneven emergence in your field because your planter was not properly set or calibrated
- Check that the planter is level, ensuring even depth on each row unit and use the appropriate planter downforce

# TARGET 80% OF PLANTS EMERGING WITHIN 48 HRS

80% of plant emergence within 48 hours of each other (higher percentage within a shorter time period is better) is a good target to aim for. If you're missing this target, hopefully this newsletter can help you find out why.



## **HOW TO CHECK EMERGENCE: FLAG TEST**

You will need 5 different coloured flags or stakes to mark out 1/1000th of an acre and 4 days of plant emergence

- Flag out 1/1000th acre prior to emergence but after planting (Colour #1)
- 2. Check 1/1000th section everyday at the same time
- Once plants emerge within the 1/1000th flagged section, use a different colour flag to mark newly emerged plants (Colour #2)
- 4. Repeat this for the next 3 days (Coour #3-5)
- 5. Determine emergence rate and planting population

## FREE EMERGENCE FLAGGING KIT FROM PRECISION PLANTING:

https://www. precisionplanting.com/ agronomy/research/freeemergence-flagging-kit



## **Additional Reading:**

→ <u>Uneven emergence in corn - North Central Regional Extension Publication No.344</u>

- → <u>Emergence Failure of Corn</u>
- $\rightarrow$  Effects of Uneven Seedling Emergence in Corn
- $\rightarrow$  Set the stage for good corn emergence

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