

Soil Temperature and Corn Emergence

Our Goal:

Yield Potential = 616.2 bu/A



You Get One Chance In 2020...

Place seeds in the soil at the
and at a
that facilitates

correct spacing
soil depth
rapid emergence and
maximizes productivity



How Does Corn Emerge

✓ Wait to plant until soil is at 50-55°F



AgriTools

University of Nebraska
- Lincoln

OPEN



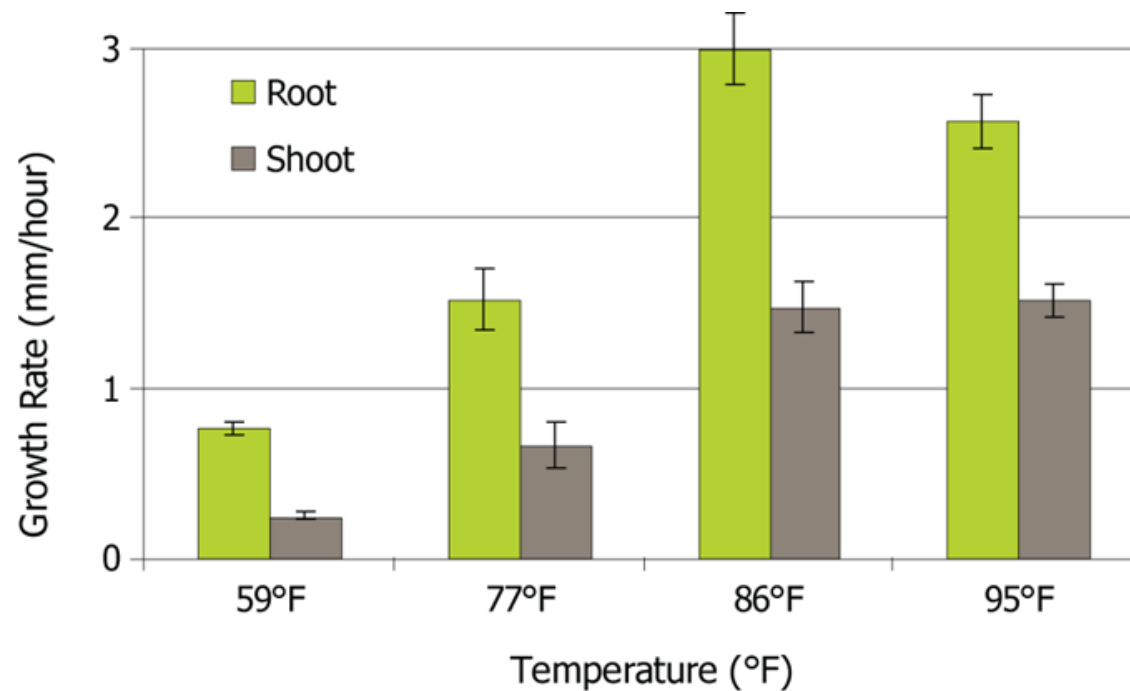
- Kernel moisture = 10-12%
- Imbibition of soil water
- Kernel moisture = 30%
- Soil at 50-55°F
- Enzymes: starch -> sugar



80 Soil GDU's: radicle
130 Soil GDU's: emergence

Optimal Soil Temperature for Corn Growth

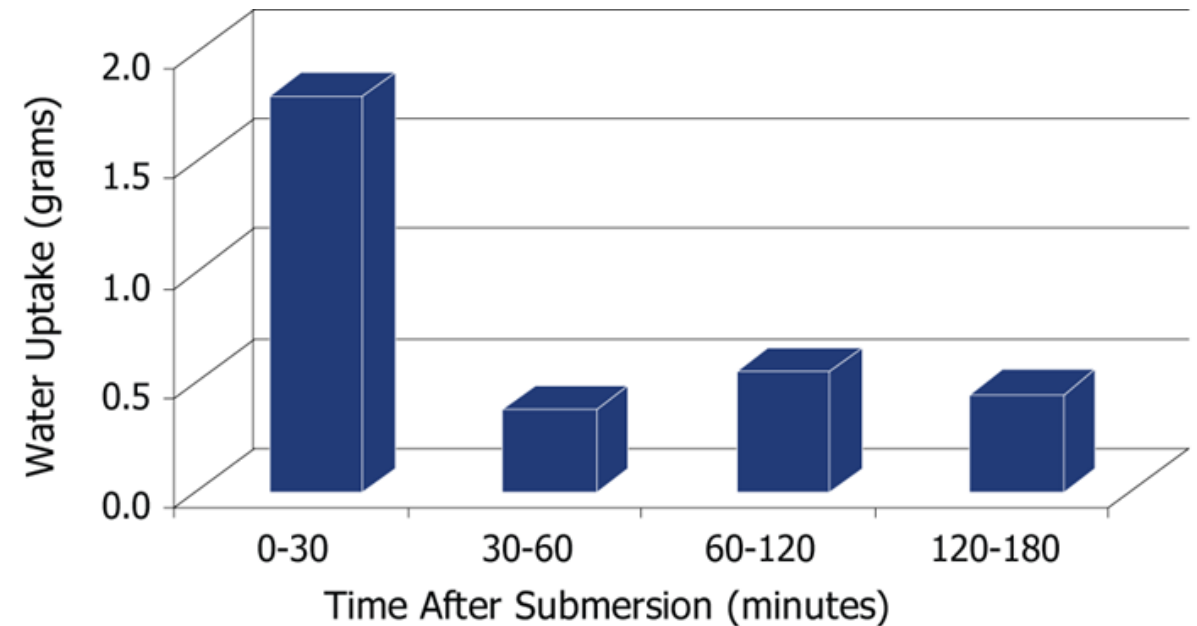
- Optimal seedling germination and emergence occurs at higher soil temperatures
- Growers can expect much slower emergence and growth at the cool soil temperatures which are typical during corn planting.



Average early root/shoot growth rates for 3 hybrids under 4 soil temperatures ranging from 59 to 95°F.

Imbibition of soil water

- Rapid water uptake happens very quickly
- If planted into cold soils lower germination and diseases can set into seedling
- First 24-48 hours critical to have warm seed bed



Amount of water uptake by corn seed during the first three hours after submersion in 50°F water.

How to mitigate stress on emergence

Q1: How deep do you plant corn on a trashy corn on corn scenario?

Answer: 2"

Q2: It's a colder spring with plenty of moisture, how deep do you plant corn?

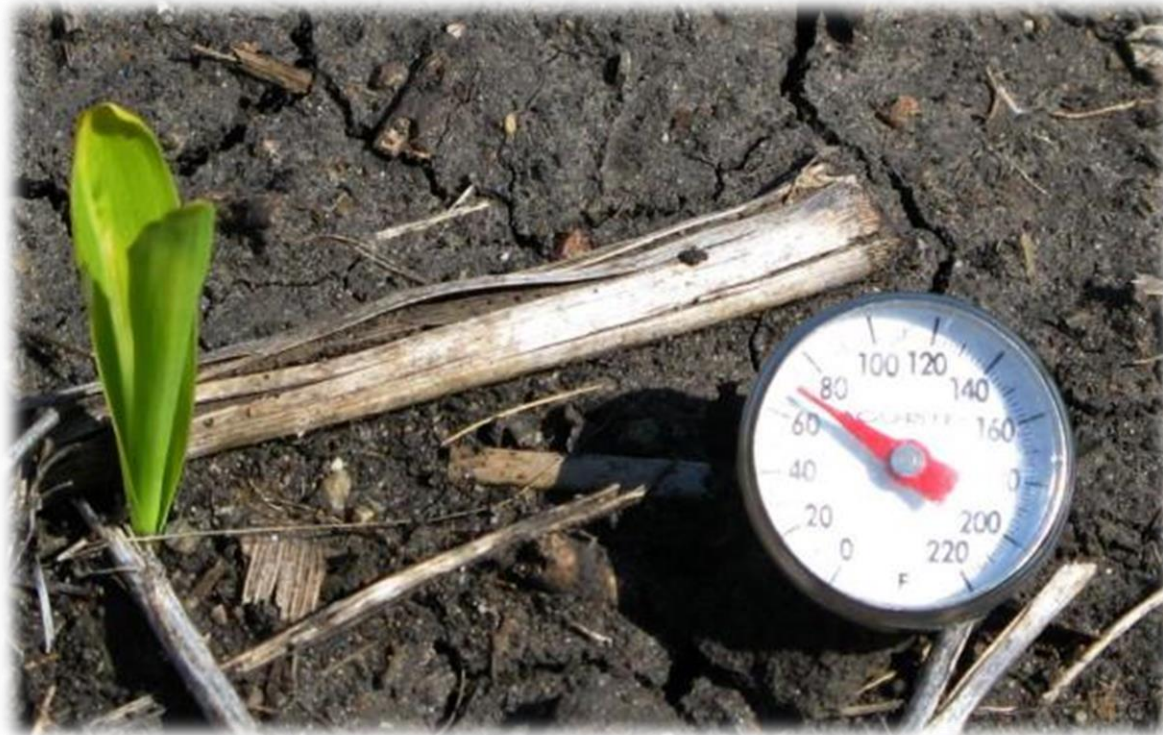
Answer: 2"

Q3: What are the reasons you plant at this depth?

How to mitigate stress on emergence

Reasons to plant at 2”:

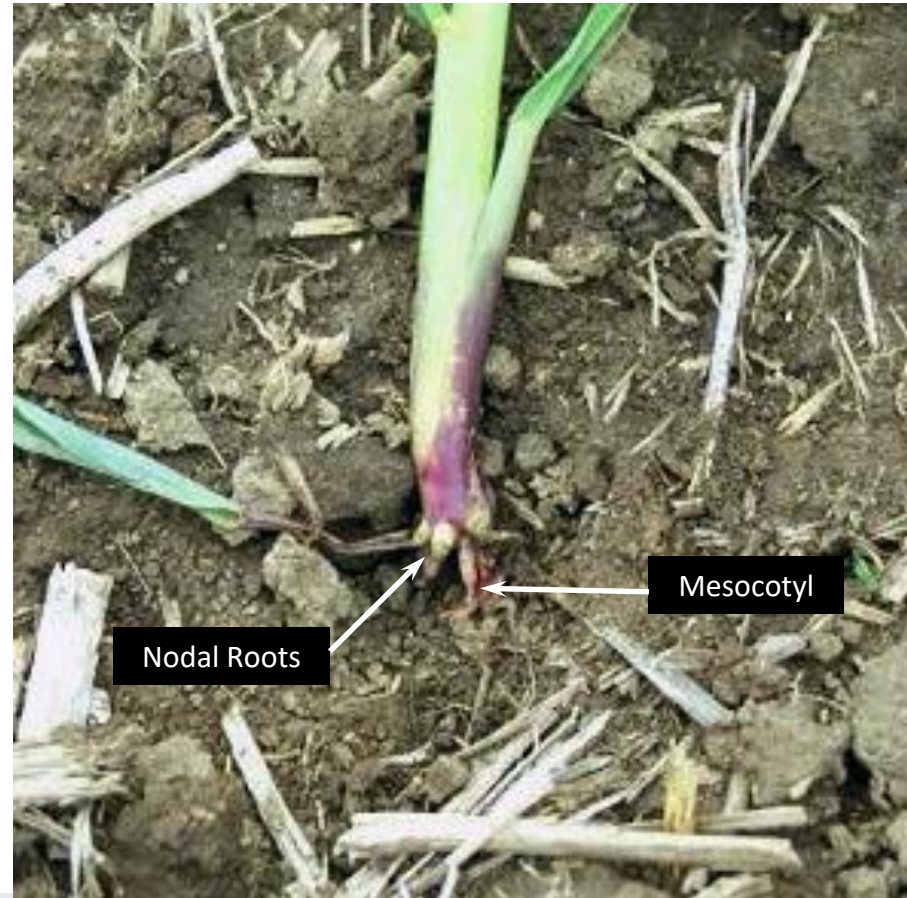
Soil temperature and moisture fluctuations occur the most in the top 1” of soil – more so in sandy soils.



How to mitigate stress on emergence

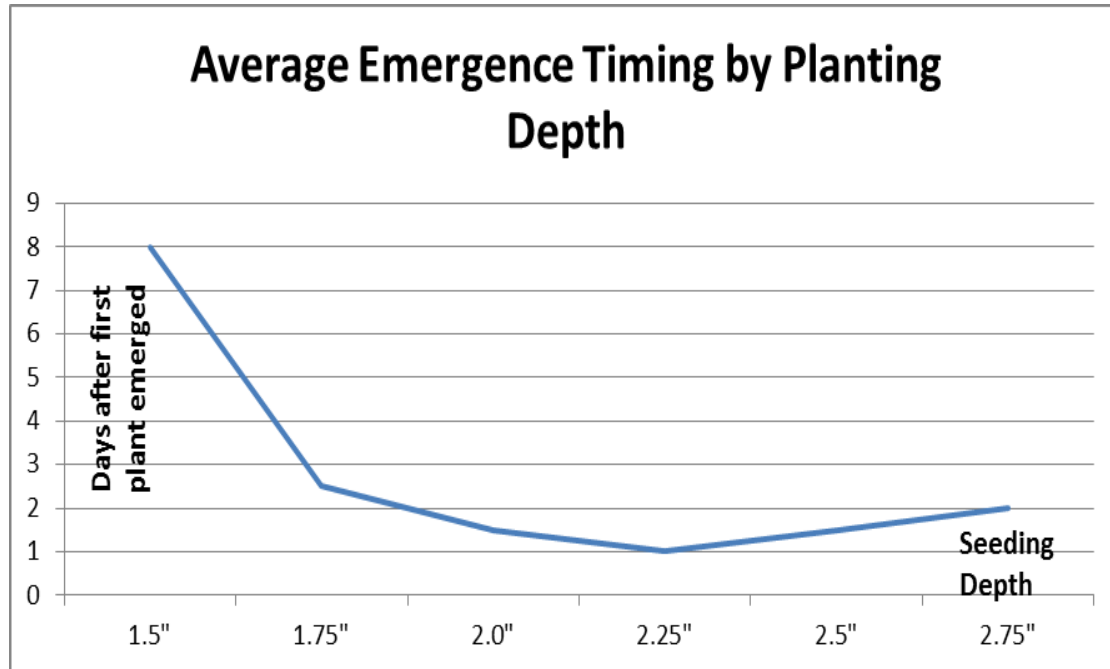
Reasons to plant at 2”:

Planting shallow will result in poor root development – rootless corn syndrome. It will also affect the plant throughout the year.



How to mitigate stress on emergence

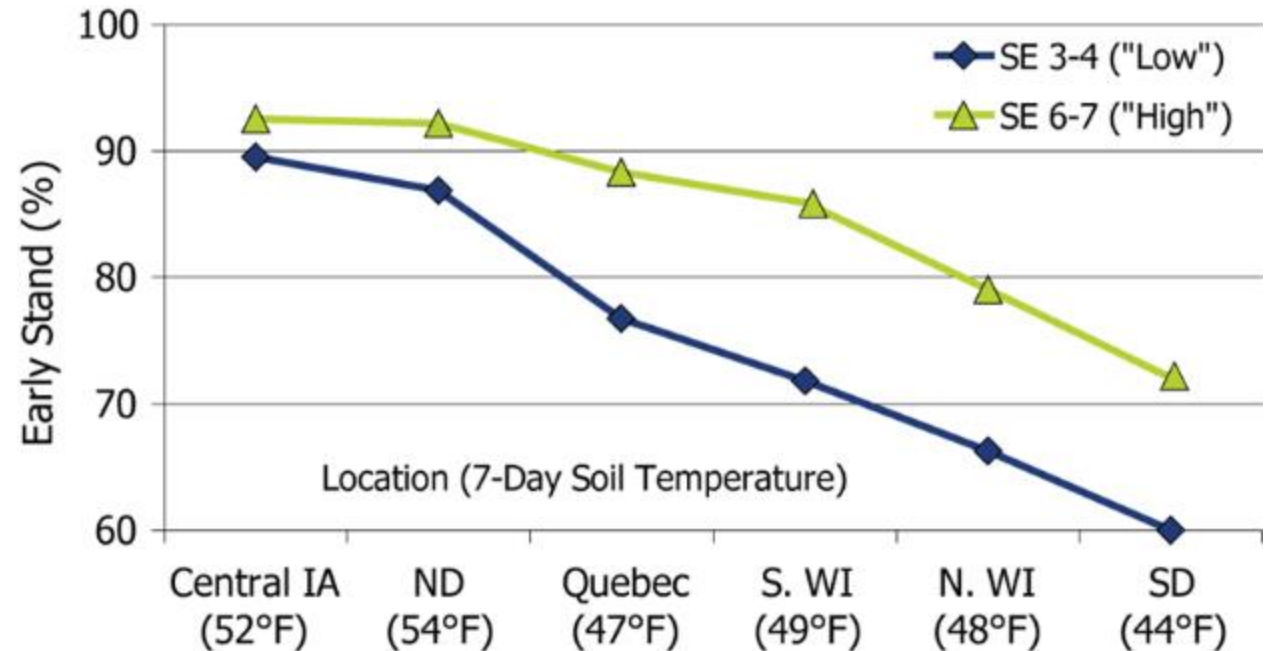
Reasons to plant at 2”:



How to mitigate stress on emergence

Selecting/ planting higher stress emergence hybrids

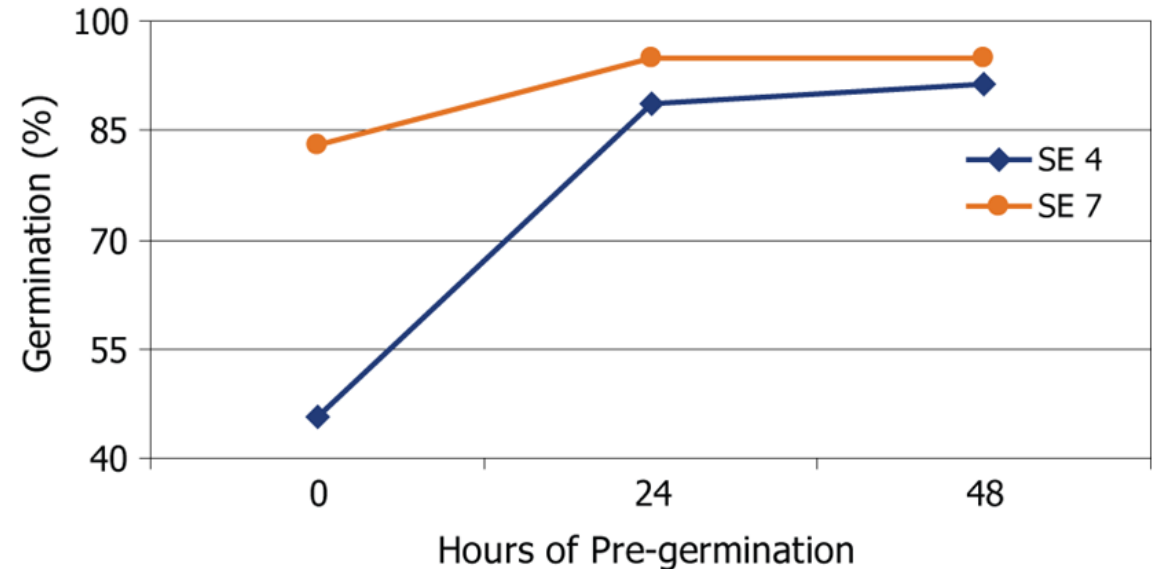
- Pioneer provides stress emergence (SE) scores for all commercial hybrids to help manage early-season risk.
- Choosing hybrids with higher SE scores can help reduce genetic vulnerability to stand loss due to cold soil temperatures.



How to mitigate stress on emergence

Selecting/ planting higher stress emergence hybrids

- Pioneer provides stress emergence (SE) scores for all commercial hybrids to help manage early-season risk.
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Germination of two hybrids with stress emergence scores of 4 (below average) and 7 (above average) following imbibitional chilling induced by melting ice.*

**Ice was applied immediately after planting (0 hours) or after 24 hours or 48 hours of pre-germination in warm conditions.*




➤ **Nutrient deficiency caused by heavy residue and cool, wet soil.**

➤ **Corn root growth decreases 5-fold when 70° F to 58° F and P uptake decreased 4-fold**

How to mitigate stress on emergence

Seed Treatments

	Trade Name	Active Ingredients	Pythium	Rhizoctonia	Fusarium	Head smut	Aspergillus	Seed borne diseases
	Maxim® Quattro seed treatment	Mefenoxam	●					
		Azoxystrobin	●	●	●			
		Fludioxonil		●			●	●
		Thiabendazole			●		●	●
	Lumiante™ fungicide seed treatment	Ethaboxam	●					
	Lumiflex™ seed treatment fungicide	Ipconazole		●	●	●	●	●
	L-2012 R biofungicide	Bacillus amyloliquefaciens strain MBI 600		●	●			
	Number of Modes of Action			3	4	4	1	3

Thank You

