
Cereal Pointers for 2022



Eastern Agronomy Update

February 2022

2021 Yields (MASC HPR Data)

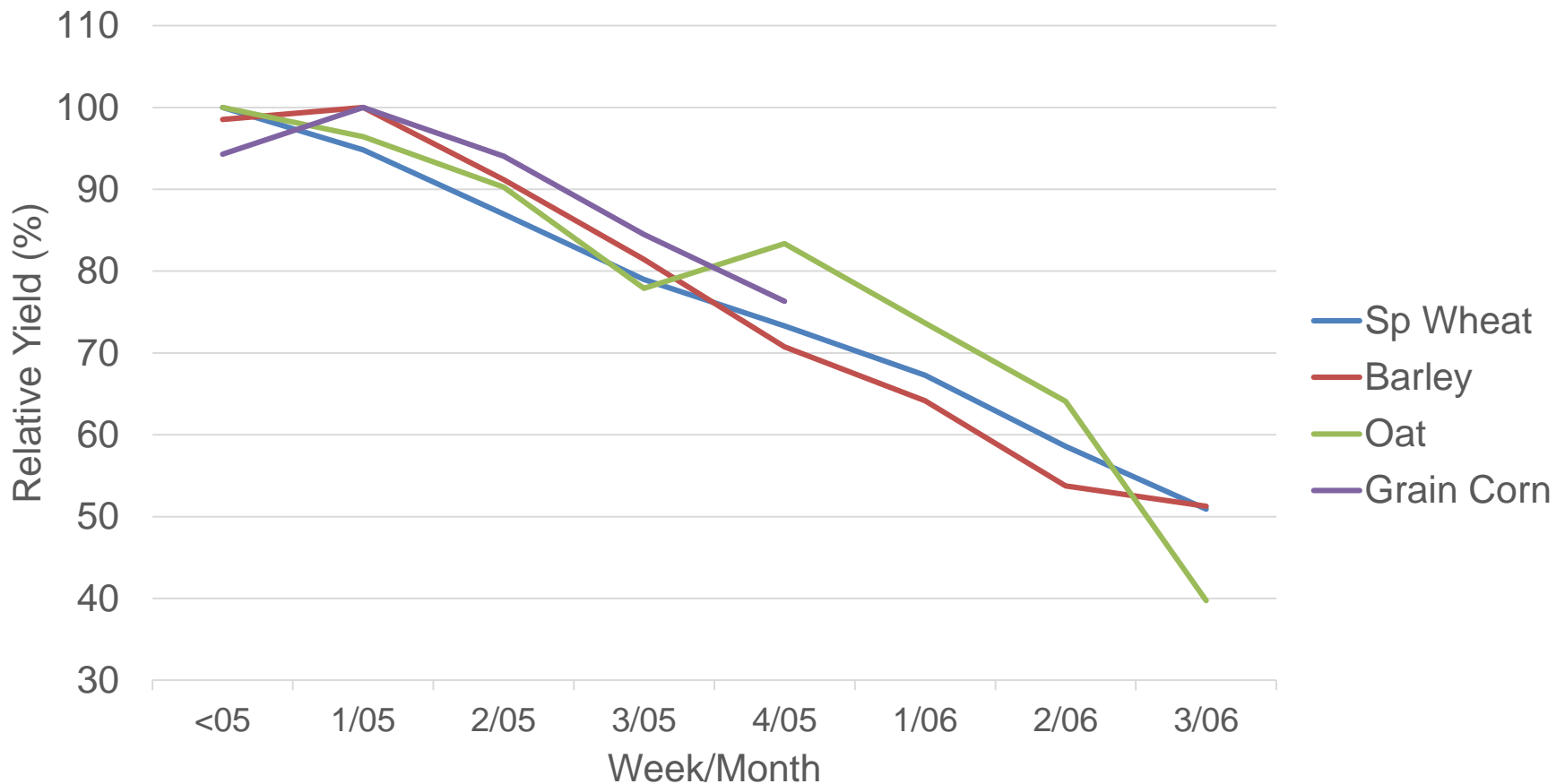
Crop	2021 Yield (bu/acre)	2020 Yield (bu/acre)	% Change	10 year average
HRSW	50	64	-22	56
CNHR	52	76	-32	70
Winter wheat	53	64	-17	63
Barley	57	82	-30	71
Oats	68	119	-43	102
Grain corn	106	129	-18	127

Spring Cereal Planting Considerations

- Timing
- Seeding rates and target plant stands



Target planting dates



Why is there higher yield potential with earlier seeding?

- Moisture
- Weed competition
- Heat damage at flowering
- Insect and disease damage
- Better harvest conditions
- Reduced lodging

Risks with earlier seeding

- Cold temperatures
- Frost damage

Crop	Minimum germination temperature (°C)
Wheat	4
Barley	4
Oat	4
Corn	10
Canola	5
Flax	9
Sunflower	6
Edible Beans	10
Peas	5
Soybeans	10

Target Plant Stands

- Recommended target plant stand in MB:
 - Wheat = 23-28 plants/ft²
 - Oat = 18-23 plants/ft²
 - Barley = 22-25 plants/ft²
- Below-optimum - may reduce resource use efficiency and yield
- Above-optimum - increase cost of production and may decrease yield due to disease, insects, lodging

Optimum plant populations can differ by environment and variety

- Agronomically optimum plant density can be reduced when yield potential increases (Bastos et al. 2020)

Optimum seeding rate (NDSU):

Across all environments: 32 seeds/ft²

Low yielding environments: 38 seeds/ft²

High yielding environments: 31 seeds/ft²

Mehring et al. 2016

When would you want to increase seeding rates?

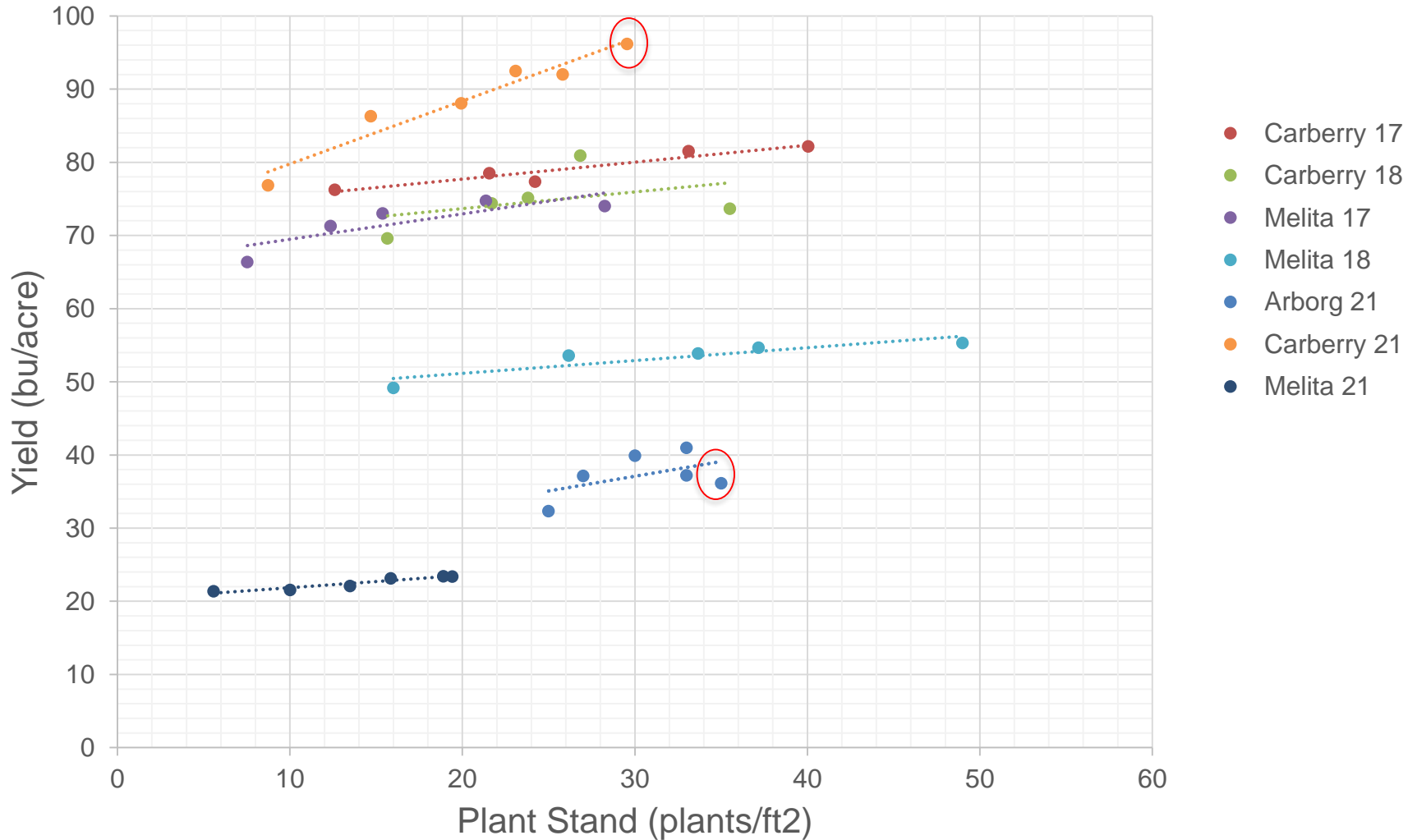
- More weed competition
- Uniform growth with less tillering
 - Easier for fungicide staging
 - Even maturity
- Lower yield potential (ex. late seeding date)

Wheat, oat and barley yields across a range of plant densities

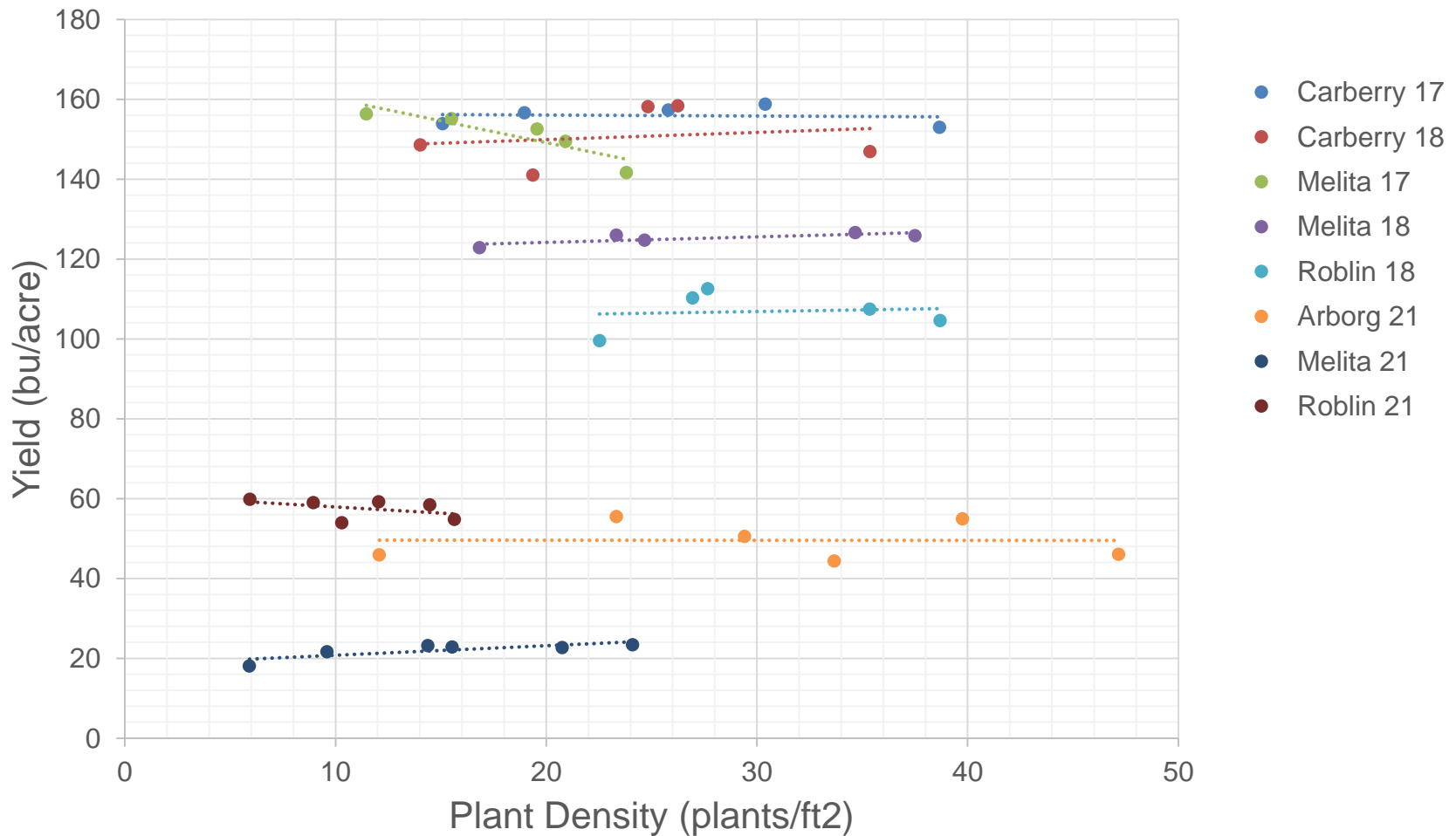


AAC Brandon wheat – Melita 2021
Target densities of 9, 21, and 33 plants/ft²

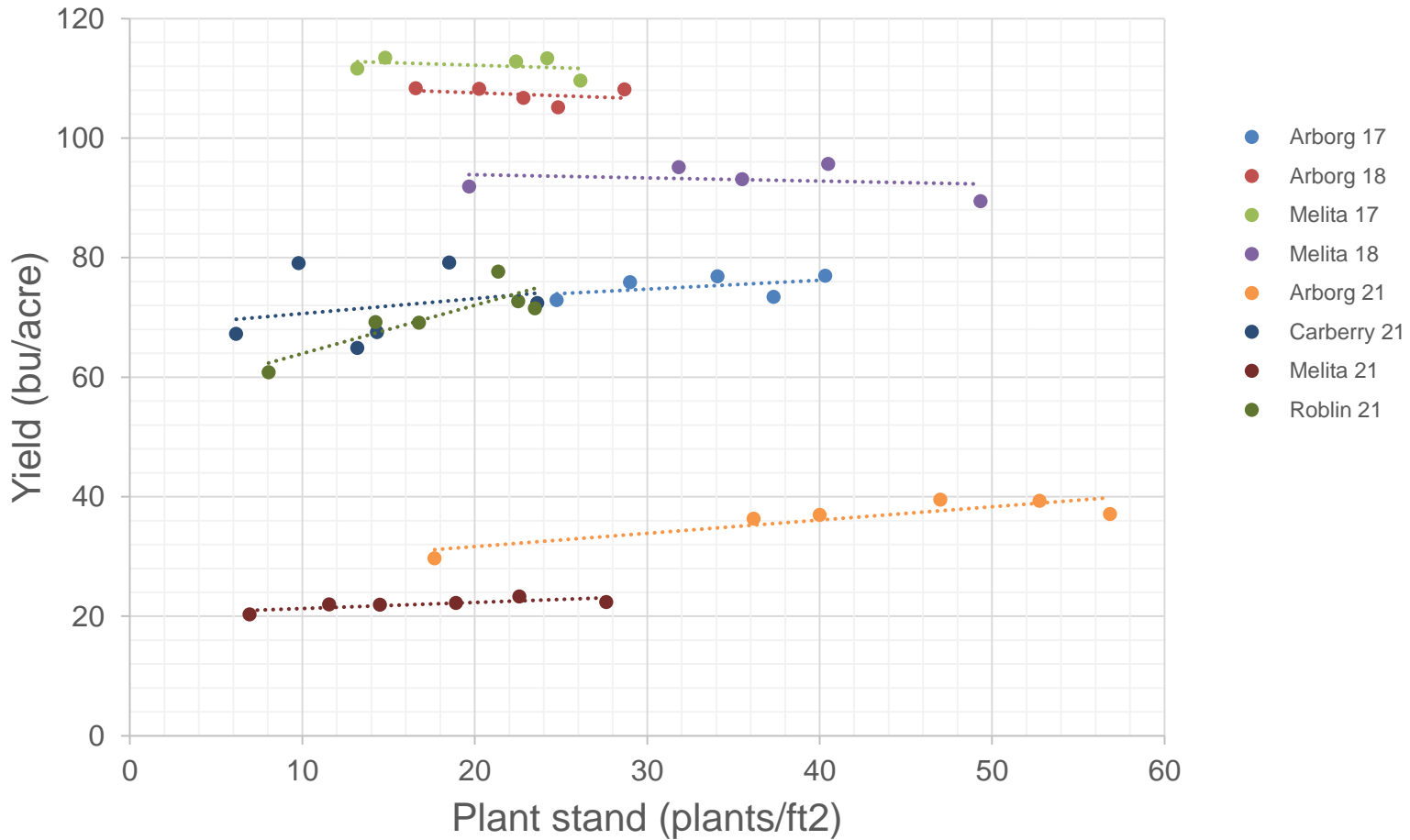
Wheat Yield by Plant Density



Oat Yield by Plant Density



Barley Yield by Plant Density



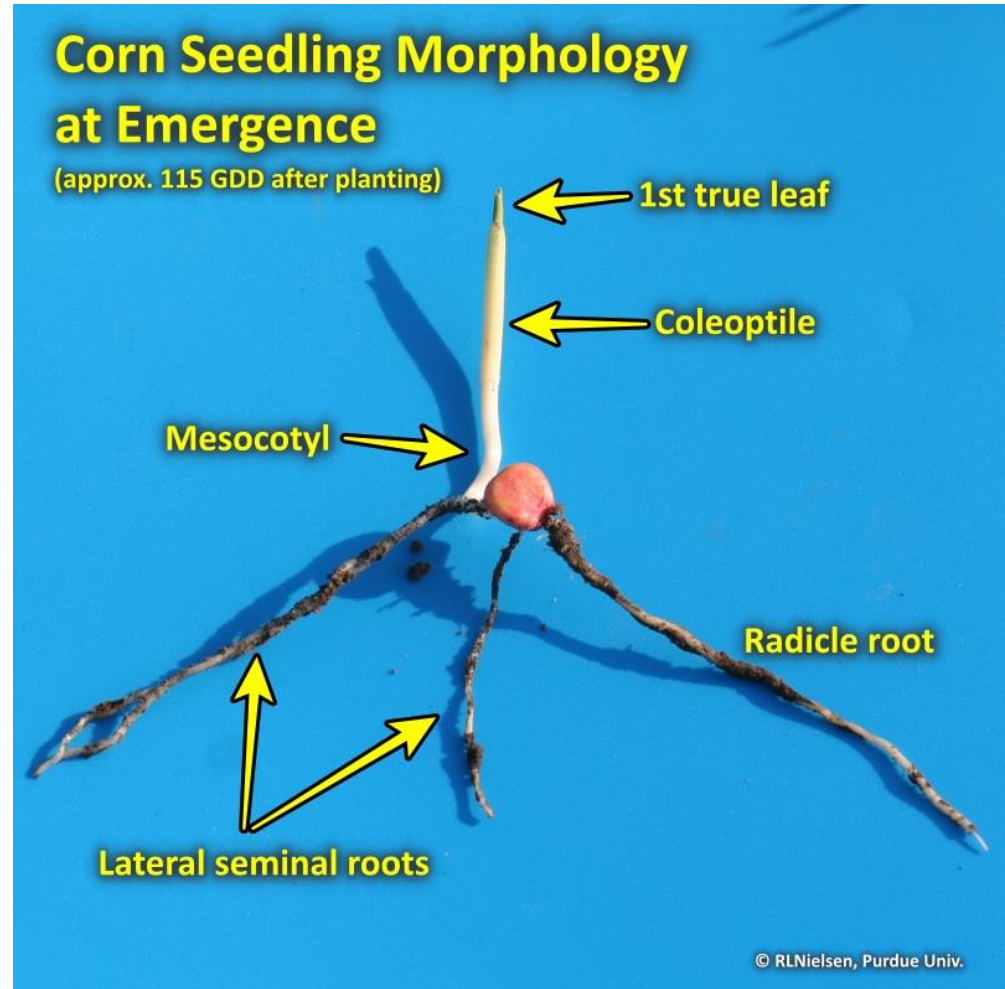


Getting corn off to a good start in 2022

- Identify yield limiting factors
- Planter to optimize seed placement, depth, spacing, and seed to soil contact
- Rapid, uniform emergence with even spacing

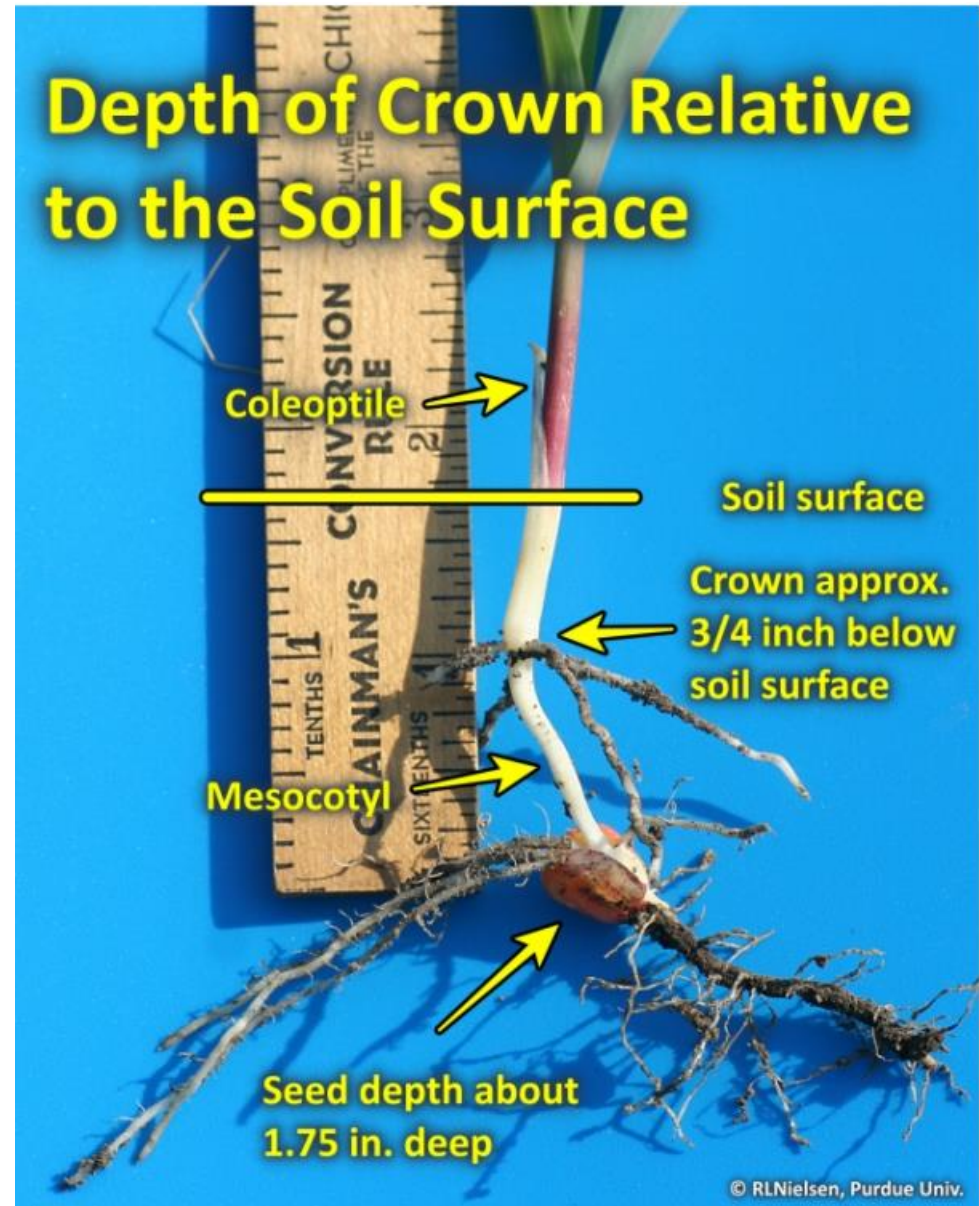
Emergence process in corn

- Typically requires 100-120 GDD to emerge
- In warm soils emergence can occur in 4 days



Planting Depth

- 1.5 – 2” is typically recommended
- Corn can be planted 3” deep if necessary and still emerge successfully



How does variable emergence reduce yield?

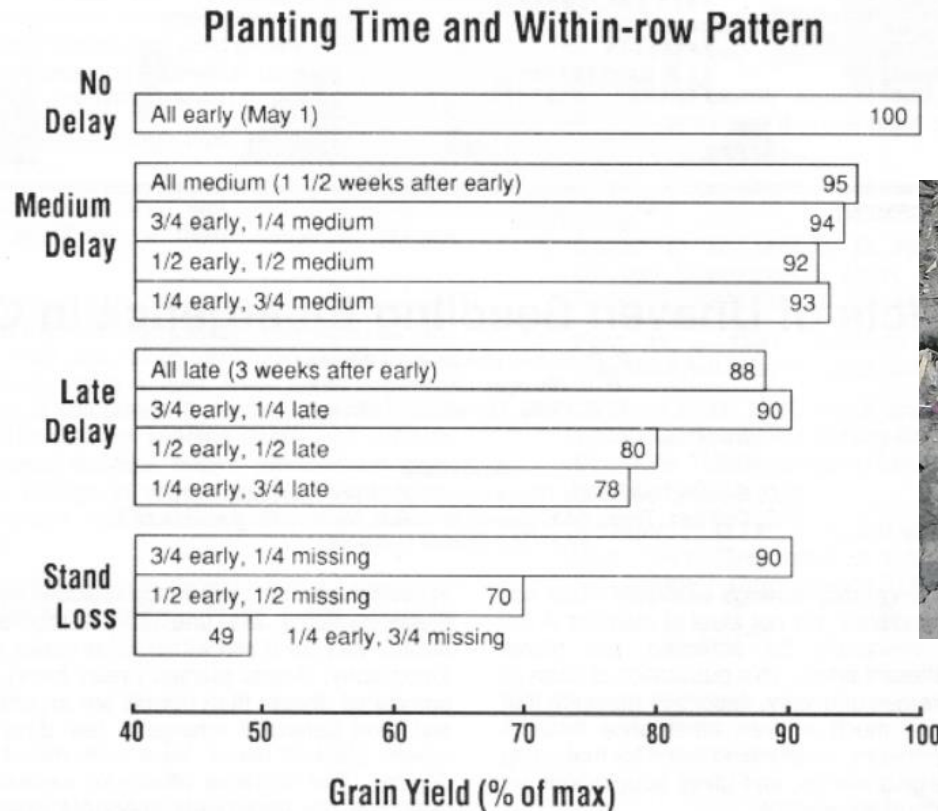


Figure 1. How Uneven Emergence Affects Grain Yield. Grain yields are shown as percentages of the maximum yield of 187 bu./a. obtained with even emergence of a full stand (26,000 plants/a.) with early planting. Yields are averages of studies with two corn hybrids in seven environments in Illinois and Wisconsin.

Plant spacing uniformity

- Assumption is that evenly spaced corn has greater yield potential than uneven stands



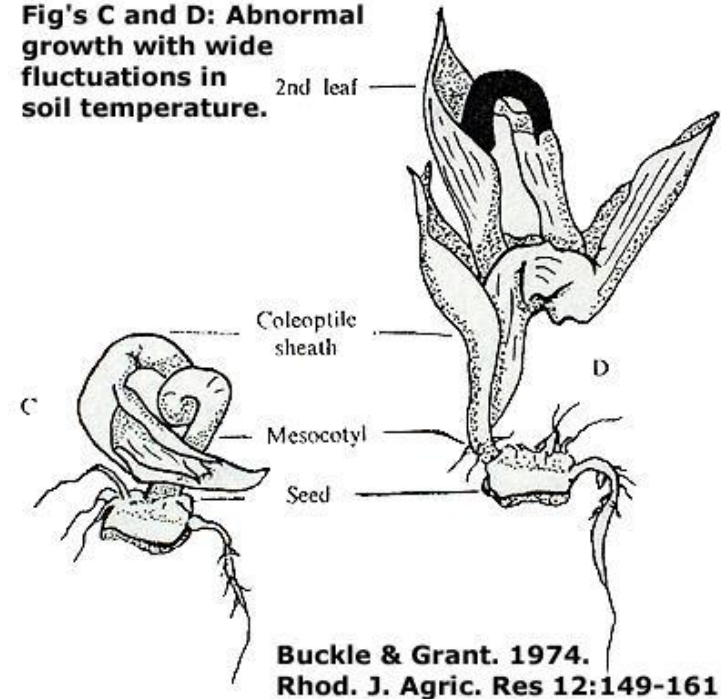
Early season corn issues:

1) Corkscrewing

Causes include:

- Soil crusting
- Dense and cloddy soil surfaces
- Cold soils or wide fluctuations in soil temperatures throughout the day

Fig's C and D: Abnormal growth with wide fluctuations in soil temperature.



Buckle & Grant. 1974.
Rhod. J. Agric. Res 12:149-161.



2) Imbibitional chilling injury

- Cold injury to the seed as the seed absorbs water
- Cold cell tissue can rupture as it swells
- May see swollen seed with no additional evidence of germination

**Arrested Development
Likely Due to
Imbibitional Chilling Injury**



3) Leafing out underground

Can be caused by multiple factors:

- Exposure to sunlight
- Soil crusting and compaction
- Herbicide injury

