

# Northern Ohio Field Notes

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## Fall Frost & Freeze Risks to Late Planted/Replanted Crops & Double Crop Soybeans





The extent of damage to corn and soybeans from a fall frost or freeze event depends on many factors: crop growth stage, minimum temperature reached, length of time at cold temperatures, crop canopy, cloud cover, wind speed, etc. It is important to differentiate the impacts of a killing freeze vs a light frost.

**Killing Freeze:** Typically occurs when temperatures reach 28-30°. Complete death of leaves, stems, and stalks occurs.

**Light Frost:** Can occur on leaves with air temperatures 32-36°. Injury to upper leaves will occur, but stalks/stems and lower leaves likely to remain alive.

Corn Growth Stage	Yield Loss: Killing Freeze (28-30°)	Yield Loss: Light Frost (32-36°)	GDUs Needed to Reach Maturity
Early Dent	35-40%		400 GDU
¼ Milkline	25-30%	14-22%	300 GDU
½ Milkline	12-15%	7-10%	200 GDU
¾ Milkline	5-6%	2-4%	100 GDU
Black Layer	0%	0%	Mature



Soybean Growth Stage		Yield Loss/Impacts
<b>R6- Full Seed</b> <i>Field is dark green; seed fills a pod on 1 of top 4 nodes. Seed is rapidly filling- each day closer to maturity lowers yield loss potential</i>		<b>Killing Freeze: 20-50% loss</b> <i>Soybeans will be shriveled, remain green in color, and are slow to dry down</i> <b>Light Frost: 0-20% loss</b> <i>Soybean seed size reduced, some damage to upper pods/seeds possible</i>
<b>R6.5- midway through seed fill</b> <i>Some yellowing/color change is noticeable in the field. Bottom leaves starting to drop</i>		<b>Killing Freeze: 5-15% loss</b> <i>Soybeans will have a mix of green/shriveled seed and mature/yellow seed</i> <b>Light Frost: 0-5% loss</b> <i>Soybean seed size reduced, some damage to upper pods possible</i>
<b>R7- Beginning Maturity</b> <i>Field is yellow, leaves are dropping, membrane around seeds is detached/nearly detached</i>		<b>Killing Freeze: 0-5% loss</b> <b>Light Frost: 0-2% loss</b>
<b>R8- Full Maturity</b> <i>Field is tan-brown</i>		<b>0% Loss</b>

## Corn and Soybean Drydown and Harvest Losses

- Corn is 30-35% moisture at black layer
- Between 30-25% takes about 30GDUs to drop per point of moisture
- Between 25-20% takes about 45GDUs to drop per point of moisture

- average of 2 corn kernels/square foot = loss of aprx. 1bu/A
- average of 4 soybeans/square foot = loss of aprx. 1 bu/A

- High of 76/low of 50 would be 13 GDU
- High of 66/low of 45 would be 8 GDU
- High of 56/low of 40 would be 3 GDU
- Wind, sun, and low humidity help dry faster

## Corn Ear Molds

Much of Ohio received favorable moisture and moderate temps around corn tasseling, with moisture continuing through grain fill. This weather can drive high corn yields, but can also increase the risk of Gibberella and other ear molds.

**Gibberella:** whitish/pinkish mold at tips of ears. This appears to be the most prevalent ear mold this year. Can produce vomitoxin.

**Diplodia:** whitish/grayish mold, usually starting at base of ear. Mycotoxins are not associated with this.

**Trichoderma:** thick greenish mold, usually associated with bird or insect damage on the ear. Mycotoxins are not associated with this.

**Fusarium:** “starburst” pattern on scattered/individual kernels. Can produce mycotoxins.

Gibberella infects corn shortly after pollination, as silks turn brown. Moist/humid weather through grainfill allows the disease to continue. Slow drydown in the fall can allow continued growth.

It will be important to scout to prioritize harvest. In severely infected fields, harvest early and dry to 15% moisture to stop mold/mycotoxin growth. Mycotoxin levels are higher in fines and cob pieces so adjust combine to reduce the amount of fines, bees’ wings, and small/shriveled/broken kernels. Core bins after filling to remove fines. Hybrids and planting dates will have an impact on severity of gibberella, but nothing is entirely resistant. Expect variability field-to-field and even within fields.



Gibberella



Fusarium



Trichoderma



Diplodia

## High Yielding Wheat Summary

1. Plant Early (within 2 weeks of the fly-free date)
2. Optimum Seeding Rate - 1.6 to 1.8 million seeds/acre is ideal starting point for planting in the early window
  - If planting date is delayed 3+ weeks beyond the fly-free date, consider an increase of 100,000 seeds/acre for each week delay
  - In wide (15”) row wheat, 1.4-1.5 million seeds/acre is a good starting point, with increases at delayed planting dates
3. Nitrogen Application of 25-30 lb/ac at planting is ideal to stimulate fall growth.
4. Phosphorus is a key nutrient for wheat to establish a strong root system and overwinter well. Soil test P levels should be at least 40 ppm (Mehlich-3), with 60-80 lbs Phosphorus (P<sub>2</sub>O<sub>5</sub>) crop removal expected from a 100+ bu/A crop
5. Planting Depth between 1 and 1.5 inches deep and make sure planting depth is uniform across the field
6. Plant into “fit” Soil - **“If you wouldn’t plant corn into the seedbed, then don’t plant wheat into it”.**

**Pounds per Acre of Wheat to Plant Based On Seed Size**

Seeds per pound	Millions of seed per acre				
	1.2	1.4	1.6	1.8	2.0
10,000	120	140	160	180	200
11,000	109	127	145	164	182
12,000	100	117	133	150	167
13,000	92	108	123	138	154
14,000	86	100	114	129	143
15,000	80	93	107	120	133
16,000	75	88	100	113	125
17,000	71	82	94	106	118
18,000	67	78	89	100	111

**Seeds per Foot of Row based on row spacing and desired population**

Seeding Rate	Row Spacing		
	7.5"	10"	15"
1,200,000		23.0	34.4
1,400,000	20.1	26.8	40.2
1,600,000	23.0	30.6	45.9
1,800,000	25.8	34.4	51.7
2,000,000	28.7	38.3	57.4
2,200,000	31.6	42.1	