Dow AgroSciences

Mycogen® SEEDS

AGRONOMY BULLETIN 28 — FROST DAMAGE AFTER PLANTING

DOES EARLY SEASON FROST MEAN THE END FOR CORN?

SITUATION

When low temperatures or frost injure young corn plants, you may wonder if these plants will recover. Carefully weigh your options and don't make any quick replanting decisions. The key to assessing corn seedling viability is to find and observe the growing point.

FACTORS TO CONSIDER

- Temperature
- Growing point
- Plant damage
- Replanting considerations

ACTION PLAN

1. **Understand the effects of temperature.** Extent of crop injury depends on whether the field experienced lethal cold temperatures or only a simple frost and the duration of these low temperatures. Lethal cold temperatures are those at or below 28 F. A simple frost occurs at temperatures above 28 F. Corn often can survive a simple frost, as long as the growing point is not affected.
2. **Look for symptoms of frost damage.** Frozen tissue usually takes on a silver color about four to six hours after temperatures return to normal. Leaf tissue will become dark and water-soaked, then turn brown and dry. New leaves should emerge from the whorl and appear within three or four days if the growing point is uninjured.
3. **Check the growing point.** The growing point of the corn seedling is where all new tissue originates and is located below ground until the plant reaches the V5 stage. To locate the growing point, carefully dig up the plant and split the stalk lengthwise from the upper leaves through the root crown. A healthy growing point is firm and white or yellow in color. If the growing point is damaged, it will be watery and orange or brown in color.
4. **Determine if replant is necessary.** Wait three or four days after the frost to determine the extent of the damage, especially if the growing point was at or near the soil surface at the time of the frost. To get an accurate estimate of the extent of damage, observe plants from at least three parts of the field. Determine original plant stand by counting healthy plants in 1/1,000th of an acre (see Table 1). Determine the stand count in the areas affected by the freeze. Once you have this information, you can determine the percent yield loss due to stand reduction from Table 2.

SUMMARY

Yield loss due to early season frost is related primarily to stand loss, not leaf damage. If plant populations are reduced significantly after a four-day waiting period, replanting may be justified. For more information, contact your local Mycogen Seeds customer agronomist or trusted agronomic adviser.

Table 1: Row Length Required for 1/1,000th Acre

15"	=	34' 10"
20"	=	26' 1"
30"	=	17' 4"
36"	=	14' 5"
38"	=	13' 8"

Table 2: Remaining Corn Stand After Freeze Damage (1,000 plants/acre)

Original Stand																			
32,000	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14
31,000	0	1	2	3	4	5	6	7	8	9	11	13	16	18	21	23	26	29	32
30,000		0	1	2	3	4	5	6	7	8	10	12	14	16	19	21	24	27	30
29,000			0	1	2	3	4	5	6	7	9	11	12	14	17	20	23	25	28
28,000				0	1	2	3	4	5	7	9	10	12	14	16	19	21	24	27
27,000					0	1	2	3	4	6	7	9	10	12	14	16	18	21	24
26,000						0	1	2	3	5	6	7	8	10	12	14	16	19	22
25,000							0	1	2	3	4	6	6	8	10	12	14	17	20
24,000								0	1	2	3	4	5	6	9	10	12	15	18
23,000									0	1	2	3	4	5	8	9	11	14	17

AgronomyServices

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Tables 1 and 2 are derived from Assessing Hail Damage to Corn, NCH-1, Purdue University.

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