

Early Season Frost Damage to Corn

The potential for late spring freeze or frost damage to corn exists on an annual basis. This *Field Facts* discusses what to look for after a freeze as well as factors that will affect management after initial injury.

Symptoms of Frost Damage in Corn

Various symptoms help growers to identify when low temperatures have produced frost damage to corn. These symptoms include the following:

- Darkening of leaves** – Within the first 24 hours after the frost, corn plants will take on a darkened, almost black appearance due to the destruction of cell membranes and the release of cell contents from damaged corn leaves (top picture).



- Plants turn brown** – When plant cells have been destroyed, the damaged leaf portions will dry up and begin to turn brown within a day after a frost. Some lower plant parts (pseudo stem) may remain intact and will stay green (bottom picture).



Diagnosing Frost Injury

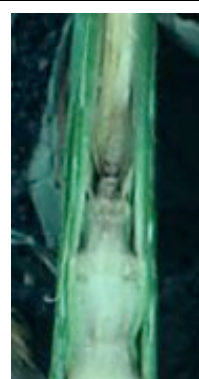
When freezing temperatures injure corn plants in a field some plants may survive and recover, while other plants will die. One of the first steps in diagnosing frost injury is to check the health of the internal growing point. Plants can be split vertically and the growing point region inspected visually for damage. If the growing point tissue is obviously damaged, plants will not recover. Corn plants die immediately when growing point tissue is frozen. Corn plants not killed immediately may still succumb to various physical or biological factors that prevent recovery, including:

- Plant starvation.** Leaf loss due to frost injury reduces photosynthetic area available to produce carbohydrates for new plant growth and recovery.
- Plant disease.** Injured plants have reduced levels of resistance to secondary pathogens invading damaged tissues.

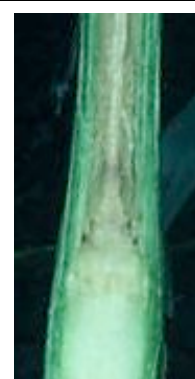
However, even if the growing point appears healthy immediately after the frost, plants still may die. Cool weather after the frost can delay visible deterioration of damaged tissue on plants. Those plants not directly killed by the frost can succumb to the other factors described above.

A reliable way to determine the impact of a frost is to wait until after three to five days with daily high temperatures above 70°F and check for evidence of new growth. Remove dead whorls and look for erect, lime green leaf growth inside the corn plant. Another sign of active growth is a “rippled” leaf effect within the whorl when the plant is cut lengthwise.

Growing points of dissected corn plants after frost.



Growing point is brown indicating plant death.



Growing point is discolored indicating probable death.



Growing point is healthy.

The “rippled” leaves indicate new growth, occurring after the frost, is backing up behind the damaged knotted whorl.

Post-Frost Management Options

When growers experience frost damage in a corn field they are faced with several management options. They may choose to **do nothing**, leaving the field as it is and allowing plants to recover on their own. Another option is for growers to **replant** their corn field, perhaps to another crop. A final management choice is to **clip corn plants** after a frost to remove the dead and decaying tissue found above the growing point. Clipping frozen corn plants to remove dead tissue has been studied by several researchers. While results are somewhat variable, the general conclusion is that clipping does not enhance yield in most situations, and often further reduces yield as compared to not clipping damaged plants.