

Frosted Corn

Corn tissue is not able to survive freezing temperatures, and so a spring frost that penetrates to the young corn plant's growing point will kill the crop. However, corn exposed to freezing temperatures after emergence will generally recover with minimal impact on the crop's eventual yield potential. Several key factors influence the speed and of extent of recovery, with the most critical factors being planting depth, crop growth stage, and weather conditions during the first week after the freeze.

Planting depth determines where the growing point is located relative to the soil surface, and therefore has a huge impact on how exposed this specific tissue is to the freeze. From emergence through leaf stage V5, at which point the crop is approaching boot high, the growing point will be located approximately an inch above the seed (at the top of the mesocotyl). If the crop was planted an inch and a half or deeper, this places the growing point of V5 and smaller corn below the soil surface where it is protected from a frost. At V5 the stalk begins to elongate, pushing the growing point upward and closer to the soil surface. Typically, the growing point will be located at the soil surface at leaf stage V7, and progressively further above the soil surface as the plant continues to grow.

Check the growing point of frosted corn to determine its location relative to the soil surface. If it is at or near the soil surface, use a pocket knife to cut a few plants open and inspect the growing points. Healthy tissue will be white; frost damaged tissue will turn brown, but this browning process can require several days. A few corn hybrids have the characteristic of initially placing the growing point further above the seed and closer to the soil surface (longer mesocotyl). Hybrids with this characteristic will be vulnerable to frost injury at an earlier stage of development.

Weather conditions after the freeze temperatures influence speed and extent of recovery, with sunny, warm, and breezy conditions being optimum. These conditions are best because they speed the process of drying the damaged tissue so that it can be shed. The plant cannot resume regular growth until the dead top is shed and the whorl is again open. Continued cold or cool, damp, and cloudy weather will strongly hinder recovery and can result in loss of stand due to onset of seedling diseases. Many growers and agronomists have tried to use various pieces of machinery to remove frost damaged tissue in an attempt to speed recovery. Unless the machine can be operated with fine precision, this operation can cause more harm than good by removing too much tissue. The best cure is generally patience and a return of warm and sunny weather.

A picture of a seedling corn plant showing the mesocotyl and location of the growing point at emergence can be viewed in the Rob-See-Co Agronomy Tip Sheet "Common Emergence Problems – Corn".