

Post Rock Extension District Column

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Crop Production Agent

How did the wheat handle the latest colder temperatures?

Kansas weather, you just have to love it or get really frustrated! At this time of year, there can be wide fluctuations of temperatures that can cause the wheat crop to go into dormancy without enough winterhardiness. So stay tuned and I will share several factors that can help you determine the degree of **potential** injury to your wheat crop.

The moisture level is a very important component when it comes to winter hardiness, according to Dr. Romulo Lollato, KSRE wheat and forage specialist. Topsoil moisture is important because **dry soils will get colder easier** than wet soils. The central part of the state has received varying levels of precipitation during the month of November and some in December, which can help buffer some of the negative effects of cold air temperatures. The cold temperatures will be more likely to cause injury to wheat if the plants were emerged and showing some drought stress symptoms.

Lollato points out that another important factor in wheat's response to the cold is whether the wheat had time to become properly cold hardened. Although there were some heat waves in October and early November, the temperatures were overall low enough to **have allowed** the wheat to develop cold hardiness. However, the extent of the unusually large and rapid drop in temperatures from well **above** normal to well **below** normal is a concern. We likely won't know for sure until next spring as the wheat comes out of dormancy.

The most noticeable symptoms will be a lot of burn-down or discoloration (purplish) of the wheat from these cold temperatures. If the wheat was bigger than normal – probably not much around here in NC KS, the plants may look just a little “rough” with a lot of brown dead-looking foliage on the soil surface. However, that doesn't necessarily mean the plants are dead.

Two other factors to consider when assessing the cold damage to winter wheat, is the **root system** and the **soil temperatures at the crown level**. So let's start with the root system. Good top growth of wheat doesn't necessarily indicate good root development. Poor root development is a concern where the conditions have been dry. Where wheat plants have a good crown root system and two or more tillers, they will tolerate the cold better. If plants are poorly developed going into winter, with very few secondary roots and no tillers, they will be more susceptible to winterkill especially when the soils remain dry. Poor development of secondary roots may not be readily apparent unless the plants are pulled up and examined more closely.

So what about the soil temperatures at crown level? There are several factors that this depends on that includes snow cover, moisture levels in the soil, and the seedbed conditions. Winterkill is possible if soil

temperatures at the crown level fall into the single digits. If there is at least an inch of snow on the ground and adequate moisture, the wheat will be insulated and protected, and soil temperatures will usually remain above the critical level. Dry soils and loose seedbeds warm up and cool down much faster than moist or firm soils, contributing to winter injury. According to the KSU Mesonet weather data library in our three PRD weather stations in Jewell, Mitchell and Osborne counties, the average 2-inch soil temperature has been between 39-40 degrees F. So that is great news!

If you have further questions on **wheat production**, give me a call or stop by any of our Post Rock Extension District Offices in Beloit, Lincoln, Mankato, Osborne or Smith Center.