

Potential Winter Wheat Damage

More and more we hear people worrying about adequate irrigation water for next summer. The weather forecast is for warmer than normal temperatures into next week, with no significant snow fall. Most have been enjoying the relatively mild winter season. In contrast to last year, very little snow has fallen and can change quickly, but we really are dependent on the blessings of heaven.

The lack of insulation that comes from adequate snow cover could pose a threat to the survival of the winter wheat crop. Low temperatures kill winter wheat plants by injuring the crown.

Suffocation is another cause of winter kill in wheat. If ice forms on the soil surface, it can cut off the oxygen supply to wheat plants below. Also, puddling of water can reduce the oxygen flow to wheat.

Another cause of winter kill is heaving. Freezing and thawing of the soil can literally lift the plants out of the ground. Local growers are concerned but can't do much about it.

North Dakota research indicates that a minimum of 3 inches of snow cover is necessary to prevent winterkill due to low temperatures. Three inches of snow is sufficient protection during most North Dakota winters, but 4 to 6 inches of snow will further reduce the extent of crown injury and generally increase stand survival. When the crown suffers winter injury, some plants may survive, but spring recovery is delayed, stands are thinned, and yields are often reduced.

Jim Shroyer, K-State Extension agronomy state leader suggests three main questions to consider when evaluating the potential for winterkill in wheat.

How well has the wheat hardened off? When temperatures through fall and early winter gradually get colder, that helps wheat plants develop good winter hardiness. When temperatures remain unusually warm late into the fall then suddenly drop into the low teens, plants are less likely to have had time to harden properly and will be more susceptible to winterkill.

How well developed is the root system? Where wheat plants have a good crown root system and two or more tillers, they will have better winter hardiness, Shroyer said. If plants are poorly developed going into winter, with few secondary roots and no tillers, they will be more susceptible to winterkill. Poor development of secondary roots may not be readily apparent unless the plants are pulled up and examined.

How cold did the soil get at the crown level? This depends on snow cover and moisture levels in the soil. For typical Kansas conditions, Shroyer says if there is an inch of snow on the ground, the wheat will usually be protected and soil temperatures will usually remain above the critical level. Also, if the soil has good moisture, it's possible that soil temperatures at the crown level may not reach the critical level even in the absence of snow cover. But if the soil is dry and there is no snow cover, there may be the potential for winterkill, especially on exposed slopes or in low-lying areas. Air temperatures below -10 degrees can certainly reduce soil temperatures below critical levels when the soil is dry and there is no snow cover.

To test for winterkill damage, producers can dig up a few plants, put them in pots, and bring them inside to warm up. If the plants do not respond to the warmer conditions, they may have suffered winterkill injury.

If plants are killed outright, they won't green up but if they are only damaged, it might take them awhile to die. They will green up and then slowly go 'backwards' and eventually die. This slow death is probably the most common result of winter injury on wheat.

Another way to determine if plants are alive is to remove some sample crowns from the field, place them in a closed plastic bag and leave them in a warm room. Crown tissue that is severely damaged will quickly turn brown in a day or so, while healthy tissue remains white.

Most haven't gone out to check their hibernating crops. There's not much we can do about it anyway. But we are going to need some good snow cover to protect it from the colder temperatures. The snow not only helps increase winterkill protection, it will also improve soil moisture once it melts.