

Will Wheat Survive?

Cold weather, dry soils raise questions about survival of wheat

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A combination of very low temperatures, dry soils and poorly developed wheat has created concern about the current wheat crop's survival, said Jim Shroyer, K-State Research and Extension crop production specialist.

Will the wheat be able to survive this combination of conditions? There is no definitive answer at this point, but Shroyer said there are some basic questions to ask when evaluating how well winter wheat can survive cold weather:

● **How well has the wheat cold-hardened?** 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 cold-harden properly and will be more susceptible to winterkill. This fall, temperatures have fallen off gradually. As a result, the wheat should be adequately cold-hardened in most cases,” the K-State agronomist explained.

● **How well developed is the root system?** Poor root development is a concern where 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 or desiccation, especially when soils remain dry,” Shroyer said. Poor development of secondary roots may not be readily apparent unless the plants are pulled up and examined, he added.

● **How cold is the soil at the crown level?** Cold injury is possible if soil temperatures at the crown level — about 1 inch (in.) deep — fall into the single digits. When the soil is dry and there is no snow cover, as is the case now, the potential for cold injury is higher, especially on exposed slopes or terrace tops, depending on the condition of the plants.

● **Is the crown well-protected by soil?** If wheat is planted at the correct depth, about 1½ in.-2 in. deep, and in good contact with the soil, the crown should be reasonably well-protected by the soil from the effects of cold temperatures. If the wheat seed was planted too shallowly, then the crown will have developed too close to the soil surface and will be more susceptible to winterkill, he added. Also, if the seed was planted into loose soil or into heavy surface residue, the crown could be more exposed and could be

susceptible to cold temperatures and desiccation.

● **Is there any insect or disease damage to the plants?** Damage from winter grain mites, brown wheat mites, fall armyworm, aphids, Hessian fly, and crown and root rot diseases can weaken wheat plants and make them somewhat more susceptible to injury from cold weather stress or desiccation.

In most cases, producers won't know for sure if the wheat has survived cold temperatures until early next spring, Shroyer said.

“If plants are killed outright by cold temperatures, they won't green up next spring. 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,” he explained.

Direct cold injury is not the only potential problem, he added. Under the kind of dry conditions the state is currently experiencing,



wheat plants may suffer from desiccation and from direct injury caused by blowing, he said.

“Any of these factors can kill or weaken plants,” Shroyer said. “But you never want to count wheat out too early, unless it has blown out. Wheat has a remarkable ability to withstand more than it seems possible at times.”



Editor's Note: *This article provided by K-State Research and Extension.*