

News Column for Use Week of 02/17/2020  
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River Valley District  
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### **Factors to Consider in Winter Survival of Wheat**

In the first month, wheat seedlings spend their time developing leaves, crown, and a secondary root system. But, they are also building and storing energy to get through winter. Normally seedlings need four to five leaves and one to two tillers to survive through the winter.

If the ground is not frozen, winter wheat is still growing roots. It is not unusual to find more development of crown roots in early February compared to December. Some of the leaves may be green while others are straw colored or pale during the winter. This doesn't mean the green is more winter-hardy than the other. Good top growth of wheat does not indicate good root growth. It takes about 4-6 weeks of the soil temperature below 50 degrees at the crown for winter wheat to fully cold harden. The colder the soil is at crown level, the quicker it becomes winter-hardy.

Even though the plant is ready for winter, wheat can still be injured or killed by cold temperatures. It depends on the temperature at the crown. If the temperature at the crown reaches single digits and/or has stayed at the lower temperature for a long time you will likely experience winter kill. The moisture of the soil going into winter can also affect the temperature of the soil. If the soil has good moisture the soil may never reach the critical level even without snow. However, if the soil is dry and no snow, there is potential for winterkill. Dry soils and loose seedbeds warm up and cool down faster than moist or firm beds. Snow can help insulate and protect the soil temperatures from dropping below that critical level. Winter survival is affected not only by how cold, but how long it is cold. As temperatures at the crown rise above 50 degrees the wheat will slowly lose its winterhardiness.

When the leaves switch from being prostrate to upright the plant has completely lost its hardiness. Symptoms of winterkill will be more apparent when it warms up and plants start getting green. If they are killed by the cold, they will not green up. Some may only be damaged and will take a while to die. In some cases, the plant will green up then slowly then start to go backwards and die. This happens because the vascular is damaged and can't get the nutrients through the plant. This slow death is probably the most common result of winter injury on wheat. For more information contact Rebecca Zach in the Concordia Extension Office by calling 785-243-8185 or by emailing [zrebecca@ksu.edu](mailto:zrebecca@ksu.edu).

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