

Shoppers Guide Article October 23, 2018

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## Freezing temperatures: Potential impacts on crop yield

Minimum air temperatures during the October 15-16 period dropped well below 30 degrees F in all but the extreme southeast corner of Kansas. This will pose a problem during the grain-filling period of summer row crops. The risk of damage to summer row crops is a function of the current developmental stage of the crop and the minimum temperature and the duration of the freeze events.

### Duration of damaging temperatures

The coldest temperatures dropped into the single digits in northwest Kansas, with the lowest reading of 9 degrees F at the Cheyenne Mesonet station on October 15. In addition to the lengthy time below freezing on October 15, by the following day (October 16), the sub-freezing temperatures had penetrated into the southeast corner of Kansas for several hours

### Effect on summer row crops

**Corn:** In most of the state, corn is mature and being harvested. The most sensitive areas, with higher probabilities of showing effects of low temperature impacts, are the northwest and west central parts of Kansas but with a potential low impact on number of acres affected due to the advanced phenology (close or already matured). Corn can be affected when temperatures are below or at 32 degrees F. The further temperatures drop below 32 degrees, the less exposure time it takes to damage corn. Test weight is usually impacted, and grains are susceptible to mechanical and drying damage. However, even though final maximum weight is not affected once the black layer is formed, producers might encounter impacts on slow dry-down conditions to harvest.

**Soybean:** Soybean is currently in the final reproductive stages (dropping leaves) in Kansas (87% dropping leaves based on the most recent [USDA Crop Progress and Condition report](#)). Temperatures below 32 degrees F can interrupt seed fill and affect yield through lower test weight and seed quality (primarily affecting protein deposition). Necrosis (death) of the leaf canopy is a visible symptom of freeze damage in soybeans. With soybean, absolute temperature is more important than the duration of the freeze event. The most severe injury occurs with temperatures less than 28 degrees F. As the crop approaches maturity, the impact of a freeze event on soybean yields declines. The most affected soybean acreage will be related to areas of late-planted and double crop soybean around the north central and western parts of the state. In addition, soybeans impacted by freeze are often slow to dry, influencing costs if additional drying is required.

**Sorghum:** More than half of the sorghum in Kansas has already reached maturity (79% mature based on the most recent [USDA Crop Progress and Condition report](#)) but is not yet in fully harvesting mode (only 19% harvested – behind the 28% average for the last 5-years). Most likely the lowest proportion of mature sorghum is located in the north central and northwest areas of Kansas. Low temperatures will reduce seed growth, affecting final test weight and seed quality, making the harvest process more difficult. A freeze will kill sorghum if the stalks are frozen, impairing the flow of nutrients to the grain. A freeze at the hard dough stage (before grain matures) will result in lower weight and chaffy seeds. Implications on drying conditions, slow to dry, and harvest operations should consider in sorghum that was affected by a hard freeze.