1. Wheat stubble burning: Pros and Cons

Wheat producers typically have three main options for managing wheat stubble fields after harvest. They can: (1) leave the residue in place and plant no-till into it; (2) till the ground and work some or all the residue into the soil; or (3) burn the stubble and residue.

Burning the stubble fields is perhaps the most controversial of those management alternatives. There are advantages to burning, which is why it remains a popular practice throughout central Kansas, but some of these perceived advantages are not as great as some believe. There are also disadvantages to burning.

If producers choose to burn their wheat stubble, timing is important. It’s best to burn as late as possible, close to the time of wheat planting. This minimizes the time the field will be without residue cover and vulnerable to erosion or surface sealing. Burning late, however, can reduce the beneficial effects on take-all. Before burning, producers should first check with the Farm Service Agency to find out if this will effect their compliance in any government farm programs.

Advantages:

* Removes residue cheaply and quickly. If the producer’s drill or planter has a hard time going through wheat residue, this can be an advantage.

* Can control tan spot disease. Tan spot spores oversummer on wheat residue, and burning will kill most of the spores.

* Can help control take-all. Take-all seems to be a bigger problem in continuous wheat on cooler, wetter soils. Burning off the residue results in a warmer, and potentially drier seedbed.
* May help control Hessian fly. This is one “advantage” that’s a little more hype than reality. Hessian fly flaxseed oversummer in wheat residue and in old wheat crowns. Some, or most, of the flaxseed is at or below ground level in the crowns. These flaxseed will not be controlled by burning. A slow, hot fire can kill flaxseed that is in residue above ground, however.

* May help control winter annual grasses, volunteer wheat, and summer annual broadleaf weeds. This is another perceived “advantage” that is only partially true. It takes a very slow, hot fire to kill cheat and volunteer seed present on the soil surface. Usually, the control is only partial. Cheat and volunteer seed that is in the soil will not be controlled by fire. Likewise, a slow, hot fire can kill summer annual broadleaf weeds that are up and growing in the field. Burning may knock back volunteer wheat if the fire is hot enough, but the growing point is below the soil at this time of the year and the volunteer may come back strong if there is good moisture and no competition from other grasses and weeds. A fast fire will be relatively ineffective in controlling weed seeds and emerged weeds and grasses.

Disadvantages:

* Removes a major source of organic matter from the field. The residue and stubble are an important source of organic matter for the soil. Burning off this organic matter will gradually reduce soil organic matter levels.

* Can harden the ground. Burning can make the soil hotter and drier on the surface, creating a hard seedbed.

* Reduces water infiltration capacity. Burning can temporarily seal the soil surface to some extent.

* Loss of nutrients. Wheat straw contains many nutrients. Burning will result in the loss of some of the volatile nutrients, such as nitrogen, in the residue. Phosphorus and other minerals are not volatilized by burning and will remain on the field in the ash, unless the ash is blown away.

* Results in smoke pollution. Air quality concerns are greater now than in the past. The U.S. Environmental Protection Agency is looking closely now at the air quality problems caused by smoke. Among other things, the EPA is concerned about smoke from cropland and rangeland burning. These are two separate issues. The USDA Air Quality Program is funding a study of burning in agriculture. Next year, a researcher from the University of Maryland will be focusing on burning of cropland residues. The study will attempt to quantify how much burning is occurring, when and over how long a period of time the burning occurs (the more spread out the burning over time, the better), and the agronomic benefits of burning, if any. The EPA will weigh the air quality concerns against the agronomic justifications in deciding whether to try to limit cropland burning in the future by some method.
What about the effect of burning on wheat yields in continuous wheat, compared to tillage and no-till? Mark Claassen, agronomist-in-charge at the Harvey County Experiment Field, has conducted a long-term study of this since 1997. The long term average yields are similar for all treatments.

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2. Management options for drought-stressed corn

In parts of Kansas and Oklahoma, dryland corn and grain sorghum have been under severe drought stress in June and early July. Some of these areas have had some rain since then, but in many cases the damage is already done, especially with corn. Subsoils are very dry, and it will take quite a bit of rain to bring these soils back to normal.

Where dryland corn has been under severe drought stress, you’ll have to decide whether to let it go and hope for some kind of grain yield or salvage the crop for silage or hay. In some cases, the corn did not pollinate well because of either drought or heat stress. Where tassels emerged during hot, dry weather, pollen dropped before the silks had come out. If the silks push out after the tassels have already shed their pollen, there will be little or no pollination of the crop.

There are basically only two options for dryland corn that has limited yield potential – silage or hay. Silage is obviously the preferred option, but you need the facilities to make silage (or sell it to someone who does), and there must be enough moisture in the plants to properly ensile. And where there’s no ear at all, silage may not be a good option. Where the ear is very small, or has poor seed set, the silage will have lower energy value (TDN) and lower overall forage quality than normal. Even at normal yield levels, silage quality begins to decline when grain yield drops below roughly 150 bushels per acre, and continues to decrease as grain yields keep going down.

To cut corn for silage, you need 65 to 75 percent moisture in the plant. If plants are still suffering from drought, they may have lost some of the bottom leaves. The top leaves may have browned off or turned white. In that case, the plants probably do not have 65 percent moisture, depending on how much moisture is in the stalk.
Where that’s the case, your only option is probably to chop and graze, or hay the crop like a summer annual forage. To avoid nitrates in drought-stressed corn, stalks should be cut at least a foot off the ground when chopping or cutting for hay. Under drought conditions, the plant does not grow normally and high levels of nitrate can accumulate, especially in the lower portions of the stalk. You should also have the corn hay (or stubble if you plan to graze) tested for nitrates. A forage nitrate test costs only $10-15 and it’s the only sure way to make sure the hay is okay to feed to cattle. Ensiling the corn, if possible, is preferred to chopping or grazing because of that potential for nitrate toxicity.

If you plan to have cattle graze the corn field after it has been chopped or cut for hay or silage, watch for any shattercane or Johnsongrass that comes up after a rain. New regrowth from these sorghum-type plants after a drought can be dangerously high in prussic acid.

Economically, should you leave the corn or cut it for silage or hay? If the yield potential is less than 25 bushels per acre, it’s probably best to cut it for silage or hay. If the yield potential is 50 bushels or more, it’s probably best to harvest it for grain. In between is the gray area. The question is how to put a value on the silage or hay. There are some rough guidelines for determining silage value that many states use (see, for example, www.agnr.umd.edu/MCE/Publications/Publication.cfm?ID=27). The basic rule of thumb stated in this publication is that a ton of corn silage standing in the field should be priced at about 6 times the market price of corn. Cutting and storage would add about $10-12 per ton.

How much silage can producers get from drought-stressed corn? A publication from the University of Wisconsin estimates that for corn that has been stressed, with limited grain yield potential, producers can expect about one ton of silage per acre for every five bushels of grain yield. For corn that is not stressed, producers can get about one ton of silage for each six to seven bushels of grain yield. If little or no grain is expected, a very rough pre-harvest estimate of yield can be made by assuming that one ton of silage can be obtained for each foot of plant height, excluding the tassel.

Grain sorghum has also been under drought stress in many areas during June and early July. But it’s too early, in most cases, to give up on sorghum. If the grain sorghum gets a rain prior to heading, it can quickly head out and recover well. Also, late tillers may form. There may be some yield reduction in sorghum from heat or drought stress that occurred as the head was forming during the 7-10 leaf stage. After heads begin filling, it takes just one or two more timely rains during grain fill to make a crop.

Drought-stressed soybeans can also recover very well at this point in the season if they get a rain during mid to late flowering. But if soybeans start dropping the bottom third of their leaves due to drought-stress before flowering, you might want to start thinking about cutting them for hay.

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