1. Home germination testing of wheat seed

The procedure for doing a home germination test on wheat needs to be explained in more detail. This test is especially important this year, when seed will be in short supply in much of central and eastern Kansas.

The following detailed procedure is taken (and slightly modified) from K-State Extension publication AF-82, “Seed Germination Test Methods.”

* Place two moistened paper towels (on top of each other) on a flat surface. The towels should not have free water in them.

* Arrange fifty (50) seeds on the towels leaving approximately an inch border around the edges.

* Place two more moistened towels over the seeds.

* Make a ½ to ¾ inch fold at the bottom of the four paper towels. This will keep the seed from falling out.

* Starting on one side, loosely roll the paper towels toward the other side (like rolling up a rug) and place a rubber band around the roll(s).

Place the roll in a plastic bag. Seal, but not completely, so as to keep moisture in but still allow some air into the bag.

For newly harvested seed:
Place the bag upright in the refrigerator for 5 days and then remove and place upright at room temperature for an additional 5 to 7 days.
Remove the sample from the bag and unroll the towels.
Count and record the number of healthy seedlings (adequate root and shoot development).

For carryover seed, or after September 1:
Place the bag upright at room temperature for 5 to 7 days.
Remove the sample from the bag and unroll the towels.
Count and record the number of healthy seedlings (adequate root and shoot development).

To calculate the germination percentage: divide the number of healthy seedlings by the number of seed tested and multiply by 100.

Example: \[ \frac{42 \text{ healthy seedlings} \times 100}{50 \text{ seed tested}} = 84\% \text{ germination} \]

This may be repeated more times for each sample in order to obtain more accurate results, testing up to 400 seed.

-- Eric Fabrizius, Kansas Crop Improvement Association, Seed Laboratory Manager efkcia@kansas.net

2. Crop residue burning: Soil quality considerations

Many producers may be planning to burn their wheat stubble this summer to help control volunteer plants, weeds, and certain diseases. While burning is inexpensive and may help clear the residue and weedy growth where the wheat crop was abandoned, producers should understand the consequences ahead of time. Some of the information below comes from K-State Extension publication MF-2240, “Wheat Stubble: What Is Its Value?”

There are four main factors to consider.

* Loss of nutrients.
The products of burned wheat stubble are gases and ash. Nutrients such as nitrogen (N) and sulfur (S) are largely combustion products, while phosphorus (P) and potassium (K) remain in the ash. When residue is burned, about a third of the N and S will volatilize. The nutrients in the ash may remain for use by the plants. Ash can easily be blown away, however. Therefore, instead of cycling these important plant nutrients back into the soil, they can essentially become air pollutants.

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Amounts of nutrients remaining in wheat stubble</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>0.53 pounds per bushel of harvested wheat</td>
</tr>
<tr>
<td>P</td>
<td>0.2</td>
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<tr>
<td></td>
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<td>----</td>
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</tr>
<tr>
<td>K</td>
<td>0.9</td>
</tr>
<tr>
<td>Ca</td>
<td>0.15</td>
</tr>
<tr>
<td>Mg</td>
<td>0.08</td>
</tr>
<tr>
<td>S</td>
<td>0.12</td>
</tr>
</tbody>
</table>

* Soil erosion and moisture concerns.
Bare soil is subject to wind and water erosion for a few reasons. Without residue, the soil will receive the full impact of raindrops, thus increasing the amount of soil particles that may become detached during a rainfall event. The detachment of soil particles can lead to crusting of the soil surface, which then contributes to greater amounts of sediment-laden runoff, and thus, reduced water infiltration and drier soils. Leaving residue on the field also increases surface roughness, which decreases the risk of both wind and water erosion. When wheat straw mulch on the soil surface exceeds 980 pounds per acre, soil loss from wind erosion averages 0.9 tons per acre, compared to 14.3 tons of soil loss per acre on bare soil.

* Moisture infiltration rates.
Wheat residue enhances soil moisture by increasing rainfall infiltration into the soil. Rainfall simulator demonstrations in Kansas during the 1990s revealed that 0.5 to 3.0 more inches of rain could infiltrate a soil covered with wheat straw than a bare soil before runoff occurred.

* Soil quality concerns.
Over time, the continued burning of cropland could significantly degrade soil organic matter levels. By continually burning residue, soil organic matter is not allowed to rebuild. Soil organic matter is beneficial for plant growth as it contributes to water holding capacity and cation exchange capacity. Soil organic matter binds soil particles into aggregates, which increases porosity and soil structure and thus, increases water infiltration and decreases the potential for soil erosion. One burn, however, will not significantly reduce the organic matter content of a soil.

If producers do 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 that the field will be without residue cover and vulnerable to erosion. Before choosing to burn residue, producers should check with the USDA Natural Resources Conservation Service and/or the Farm Service Agency to find out if this will effect their compliance in any conservation programs.

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These e-Updates are a regular weekly item from K-State Extension Agronomy and Steve Watson, Agronomy e-Update Editor. All of the Research and Extension faculty in Agronomy will be involved as sources from time to time. If you have any questions or suggestions for topics you'd like to have us address in this weekly update, contact Steve Watson, 785-532-7105 swatson@ksu.edu, or Jim Shroyer, Research and Extension Crop Production Specialist and State Extension Agronomy Leader 785-532-0397 jshroyer@ksu.edu