Continuous Winter Wheat

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You will be hard pressed to find an agronomist who does not advocate the use of crop rotation in annual cropping systems. The myriad benefits of crop rotation are well known, although not always well understood. These benefits include:

- ✓ improved control of disease, insects, and weeds
- ✓ improved soil fertility if legumes are included
- ✓ better management of soil water
- ✓ improved soil tilth and aggregate stability
- ✓ better management of production and market risks
- ✓ reduced soil erosion

Despite the many benefits of crop rotation, growers are occasionally confronted with situations where for one reason or another they would like to grow the same crop in two consecutive years in the same field, that is, continuous cropping. Economics can often be the incentive for ignoring generally accepted agronomic recommendations for crop rotation, although other reasons such as machinery or labor constraints can also play a role. The remainder of this paper will discuss the potential problems and pitfalls associated with continuous winter wheat and offer some suggestions for dealing with the common problems associated with growing winter wheat in consecutive years.

Strong wheat prices and the reduced cost of inputs for wheat relative to some other crops such as corn, have motivated some growers to seed winter wheat back into winter wheat stubble in order to increase their wheat acreage. While at first this may sound like a reasonable response to market signals, it is fraught with many perils.

A multitude of potential pest problems await growers who seed winter wheat into wheat stubble. Perhaps none is more problematic than the residue-borne diseases: tan spot, Septoria leaf blotch, Septoria leaf and glume blotch, Cephalosporium stripe, root and crown rots and associated seedling blights caused by *Fusarium* and *Bipolaris* species. The primary management recommendation for these diseases is crop rotation. Rotation to non-host crops allow time for the pathogen-infested residue to degrade and reduces the quantity of pathogen propagules. Wheat planted after wheat is exposed to higher pathogen populations and is thus more likely to become infected and affected by these pathogens.

Planting resistant cultivars, when available, is an effective and inexpensive way to manage plant disease. Current wheat cultivars have varying levels of resistance or tolerance to some of the residue-borne diseases. Be sure to use cultivars that are adapted to your location.

Planting on the optimum planting dates is also helpful for controlling the severity of some soil-borne diseases. For example, Cephalosporium stripe will be more severe if wheat is planted too early because the excessive root growth resulting from early planting provides more entry points fo rthe pathogen when the roots are subjected to winter injury. Early planting also increases the severity of common root rot, seedling blight, and spot blotch.

Growers who plant wheat into wheat stubble should use fungicide seed treatments to protect plants from residue-borne pathogens that cause root and crown rotsseedling blights and seed-transmitted foliar diseases. They should also plan to scout their fields for foliar soil-borne diseases such as tan spot, Septoria leaf blotch, Septoria leaf and glume blotch, and eyespot and be prepared to apply the appropriate fungicides in a timely manner when necessary.

Winter annual weeds such as downy brome, jointed goatgrass, feral rye, and mustards thrive in the second year of wheat following wheat. All of these weeds have been problematic in winter wheat-fallow rotations and they will be more so in winter wheat seeded directly into wheat stubble. Although the winter annual broadleaf weeds can be easily and economically controlled in winter wheat with a well-timed application of 2,4-D, with or without a sulfonylurea herbicide such as Ally or Amber, the winter annual grass weeds can be more problematic. Again, the best control option for the winter annual weeds is crop rotation with warm-season summer crops such as corn, proso millet, or sunflower.

The risk levels for several insect pests, for example cereal aphids and Hessian fly, may be increased in continuous wheat. The wheat stem sawfly, a growing insect threat in the Panhandle, is of greatest concern in wheat that is no-till seeded into winter wheat stubble. The larva of the sawfly overwinters in the base of the wheat stem. When it emerges the next spring, it tends to infest plants at the edge of the adjacent winter wheat strips or fields; however, if wheat is seeded back into an infested field, the sawfly infestation can affect a much greater portion of the field because the fly does not need to move to and adjacent field to find wheat plants to infest. The sawfly larva cuts the stem at the base of the plant and these plants tend to fall over right before harvest, resulting in significant yield loss. While once limited to fields in western Banner and Scotts Bluff Counties, in the last two years the wheat stem sawfly has begun to cause problems throughout Banner, west Box Butte, and Morrill Counties. Problem fields in these counties have been limited to no-till wheat fields.

Although plowing can aid in the control of many of the aforementioned disease, weed, and insect pests, plowing has its own problems including increased risk of soil erosion, increased loss of surface soil organic matter, and increased loss of stored soil water. It is far more advisable to avoid seeding winter wheat into wheat stubble and stick with a sound crop rotation that includes a summer crop, summer fallow, or both.