



Wheat Seed and 'Reversion'

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Every year, about this time of year, I get a question about wheat seed and why it "reverts" back to its parents. Does a wheat variety really revert back to the characteristics of its parents?

First, a little background on wheat breeding is in order. A wheat variety is developed by crossing two or more parents (pure-line wheat varieties) to create a breeding population. Over years, the breeder allows this segregating population to self-pollinate. Meanwhile, testing allows the breeder to select only the best lines from the population to be saved from year to year. After about ten years, the wheat lines in the breeding population are essentially finished segregating and are what we can now

think of as "pure lines" or a "pure variety". Seed of this pure variety (Breeder's seed) is increased through the Foundation, Registered, and Certified levels to be made available to the general public.

After farmers plant Certified seed of a new wheat variety, they sometimes save back some of their production to use as seed the following year. After several years of doing this, some farmers notice that the characteristics of the variety seem to have changed. The chaff colors of the variety may start to become variable, or the height is not as uniform as it was before. Sometimes the yield performance of the variety drops off, or its disease resistance is diminished. The lesser performance, combined with the increased variability in visual appearance, lead to a perception that "this variety is reverting back to its parents."

It's not true that varieties revert - but they do get contaminated and out-cross to a small degree. These are the real reasons why varieties change over time, and why planting certified seed is the best way to keep the varietal characteristics intact.

How do contamination and out-crossing change a variety?

Contamination: Some farmers who save and clean their own seed don't take the same degree of care to keep the variety pure which a certified seed grower does. They also don't have their fields inspected each year for varietal purity. There are many little ways in which other varieties can get comingled with seed (not cleaning out the



photo by B.Erker

Awne wheat planted next to awnless wheat.

combine, trucks, cleaner, and bins between varieties, just to name a few). When you add these up over several years, the appearance of a seedlot of "saved" seed versus that of certified seed of the same variety can be quite different. Hence, the myth of "this seed must have reverted!"

Out-crossing: Although wheat is considered a self-pollinated crop, it does have a small degree of "out-crossing" or natural pollination between plants, rather than within a single floret (1 to 3%). For this reason, certification standards include isolation requirements, to minimize out-crossing. For example, the Colorado Seed Growers Association requires ten feet of isolation between varieties in wheat (more between red and white wheats). Out-crossing can, over generations, introduce off-type plants into a seedlot that could be misinterpreted as the variety "reverting". Foundation seed programs remove these off-types to maintain the purity of varieties within the Certified seed system.

The take-home message is this: It is the process of seed certification, through avoidance of contamination, and prevention and removal of

off-types, which keeps a wheat variety close to its original form. If you think your wheat seed has reverted, its probably time to buy some new Certified seed.

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