



## Wheat Conjures Up Several Paradoxes for Aerial Applicators

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**T**he relationship between aerial application and wheat is almost as varied as wheat is itself. Several hundred varieties of wheat in the U.S. fall into six classes: hard red winter, hard red spring, soft red winter, durum, hard white wheat and soft white wheat. Depending on the climate and weather conditions, and disease or pest pressures that may or may not be present, aerial applicators can play a major role in wheat's development or they could have a modest one. But modest these days isn't as modest as it used to be.

Aerial applicators' role in treating wheat is on the rise even as wheat cedes acres to corn and soybeans. It's an interesting paradox: aerial applicators may be treating fewer wheat acres overall than they used to, but the workload for the wheat they do support has increased, in many cases, as preventative applications have become more accepted by growers.

The paradoxes don't end there. The amount of wheat spraying fluctuates from year to year, yet wheat is a more consistent source of work for aerial applicators. It fluctuates for obvious reasons: the weather—the overriding factor in wheat disease development—and insect pressures are unpredictable. It's more consistent because growers have gotten into the habit of doing more preventative fungicide and herbicide treatments.

Historically, wheat was sprayed by air only for weed control in the spring, especially if fields were too wet to get into them with ground rigs. "Two developments in the last 10 years have changed that," said Brian Rau, owner/operator of Medina (N.D.) Flying Service and NAAA's president in 2010. The first is the application of fungicides to control Fusarium head blight, or scab, and the second is the use of glyphosate as a preharvest aid. "These two reasons make wheat a more consistent source of work."



*Brian Rau's Thrush nestles in a North Dakota wheat field. North Dakota is the second-leading wheat producer in the U.S. behind Kansas.*

Record wheat prices this year haven't hurt either, but Nick Fassler, Technical Market Manager for Fungicides at BASF, points out the market for early application of wheat came about as far back as 2003 when wheat prices were much lower. He has seen the market for fungicide applications and herbicide timing grow over the years and he expects it to continue to expand. "They are definitely excellent areas for aerial applicators to make a home for themselves, and I think those acres will be consistent too," Fassler said. "It won't be the emergency type scenarios of having to run over here and treat a couple

of thousand acres and be the end of it, but more something that's consistent year after year, like what we've seen in the development of corn and soybean acres over the last couple of years."

Which brings us back to the first paradox. "In my community [where hard red winter and hard red spring wheat are grown] we've seen a decrease in wheat acres with the movement toward more corn and soybeans," Perry Hofer of Doland (S.D.) Aerial Spraying said. Wheat acres range from one-third to half of the total acres he sprays now, compared to three out of every four acres in the past. The shift to corn and soybeans began five or six years ago, Hofer estimates, and gradually got more pronounced.

Even though wheat has lost ground to corn and soybeans, lessons learned from the corn run have had a positive carryover effect that benefits aerial applicators. Farmers satisfied with the boost in yield from corn fungicide applications have shown a willingness to do the same with wheat. That can provide a measure of certitude for aerial applicators in hot, humid areas that even with variances in wheat spraying that occur from year to year, the floor isn't as low as it may have once been.

Hofer has a set of customers with wheat fields he knows he'll be spraying every year, which allows him to plan. "I already know when it's time to spray spring wheat or their winter wheat, they're going to be calling me to do it," he said. "I like to have that, like every aerial sprayer does, because you know you've got some work during this time of year. You get down to the bug runs and stuff, those are the emergency things that everybody wants you yesterday to do."

### **Circumstantial Evidence**

Aerial application plays a valuable role in protecting wheat and enhancing its



yields, but circumstances still dictate to what extent. Wheat stem sawfly, wheat midge, aphids and army worms all present problems, but insect and pest pressures are much more variable than the disease pressures wheat growers face year in and year out. Several foliar fungal diseases can and frequently do afflict wheat, including scab, tan spot, powdery mildew, stem rust, leaf rust and stripe rust. Disease development largely depends on the weather and the stage of the crop's life cycle.

North Dakota predominantly grows spring wheat and is the second largest wheat producing state behind Kansas in the United States. Anywhere from 10 to 50 percent of Rau's total spraying can be applied to wheat in a given year. "Herbicide can be almost nothing in terms of work early in the season, and it can be a great deal of work depending on the weather conditions," Rau said. He mainly sprays hard red spring wheat. Hard red winter wheat and durum wheat get treated by air to a lesser extent.

Heavy snow last winter and a wet spring delayed some of North Dakota's spring wheat planting. Chris Wharam covers North Dakota and northwest Minnesota as a technical service representative for BASF. He believes the later planting could lead to additional fungicide applications on spring wheat. Instead of occurring in early to mid July, the heading and flowering period will end up being closer to the end of July or beginning of August. "Our weather patterns at that time are typically fairly warm and fairly humid, and that's a perfect recipe for head scab to develop," Wharam said. "[That's] certainly an application that in a lot of years ends up being an aerial application."

In Kansas, over the last 10 years, wheat spraying has ranged from a quarter to a third of Chanay Aircraft Service's total annual spraying. "Last year it was up. That

was probably one of the higher years that we had," operator Doug Chanay said.

This year has been one of his lowest wheat-spraying years, far below average. A long drought has ravaged wheat-growing areas in the western two-thirds of Kansas, western Texas, the panhandle and central Oklahoma, and parts of Nebraska, Wyoming and eastern Colorado. "Quite a few farmers here on dryland wheat have gotten the insurance O.K. to destroy their wheat and consider doing something different," Chanay said.

Climate varies across the country, but those differences are more constant. "Each area is a little bit different," said Rod Thomas, operator of Thomas Helicopters Inc. in Gooding, Idaho, and NAAA's president in 2007. "We raise primarily soft white in my part of the country, but our state varies vastly. Our grains for the most part are all irrigated, and in other parts of the state in northern Idaho it's all dryland grain."

The humidity is so low in Idaho that they seldom get funguses in grain. "In areas where it's humid and hot and wet all the time, if it stays nice and moist, they get lots of flying. We don't get that," Thomas said. "I've put a fungicide on a wheat crop, or any grain crop for that matter, once in the last 12 or 13 years."

## A Time to Spray

In general, the growth stages and application timings for wheat hold constant across all varieties. What changes are the dates on the calendar when they occur. Not all applications are performed by air, but when the conditions are right, an aerial applicator has the potential to apply the following treatments at critical points in wheat's growth cycle, and that doesn't take insect pressures into account.

**1. Early Application:** This typically occurs whenever a herbicide application is going on spring wheat

or winter wheat is coming out of dormancy. A half-rate of fungicide may also be recommended at this stage, typically in early to mid April for winter wheat, to target early season diseases. In some winter wheat regions, including Kansas and Missouri, aerial applicators are sometimes called upon to apply a spring fertilizer application.

**2. Flag Leaf Application:** This is a significant stage in the growth cycle because the flag leaf makes up about 75 percent of the effective leaf area that contributes to grain fill. This is an especially critical application time in the Great Plains where they typically battle stripe rust. As with other wheat applications, aerial applicators and farmers are working within a narrow timeframe, a window of no more than seven to 10 days.

**3. Flowering Application:** Also known as head scab application, wheat is most susceptible to *Fusarium* head blight, or scab, during the flowering growth stages right before the grain ripens and the kernels harden in preparation for harvest. Protecting the head from scab is important because of the potential grain risks. In severe cases of head scab, the farmer could be docked significantly for each bushel of wheat he sells or the grain could be rejected outright. Aerial applicators are frequently called upon to treat head scab for those reasons.

That's not necessarily the case for herbicide applications on wheat. Several operators noted herbicide applications are often applied using ground rigs when the fields are dry. Another contributing factor is the presence of adjacent crops that are susceptible to glyphosate.

"Anything you spray with a broadleaf [herbicide] to control the broadleaf weeds in the wheat is not going to be good for soybeans. And anything that

goes after the grasses in the wheat is not going to be good for corn, so you've got to pay attention to what's bordering the wheat field that you're spraying," Hofer said.

With that being said, he would still bank on the skill and professionalism

of an aerial applicator. "My personal opinion is the airplane is the best way to handle your herbicide and fungicide applications in wheat even if it isn't wet and you cannot go with a ground rig, because of the fact you're not trampling down that crop."

Readers can take that with a grain of salt if they wish, but let's not forget that with a thousand acres of wheat of his own, Hofer is a fairly significant grain farmer in his own right. ■

## Let's Hear It For the Red, White and ... Durum?

Both of my sisters were allergic to wheat when we were kids, which was a problem since wheat ingredients are in every kind of food imaginable. Several hundred varieties are produced in the United States, but they fall into six basic classes of wheat that are planted in either the fall (winter wheat) or the spring (spring wheat). Winter wheat, which typically accounts for 70–80 percent of U.S. production, gets planted in the fall and harvested in the spring or summer. Spring wheat is harvested in late summer or early fall.

Fortunately, my sisters grew out of their allergy. Suddenly, a whole new world of foods derived from the six classes of wheat was open to them. Here's a primer on everything they were able to enjoy once those amber waves of grain were no longer off limits. —J.C.



### Hard Red Winter (HRW) Wheat

**Uses:** Excellent milling and baking characteristics for pan bread. Also used for Asian noodles, hard rolls, flat breads, all-purpose flour and as an improver for blending.

**Produced in:** Great Plains states

**Did you know?** HRW is the largest class of wheat produced each year.



### Hard Red Spring (HRS) Wheat

**Uses:** "Designer" wheat foods like hearth bread, rolls, croissants, bagels and pizza crust.

**Produced in:** Minnesota, Montana, North Dakota, South Dakota

**Did you know?** HRS wheat contains the highest percentage of protein of any wheat class.



### Soft Red Winter (SRW) Wheat

**Uses:** Flat breads, crackers, cookies, cakes, and other pastries.

**Produced in:** Areas primarily east of Mississippi River

**Did you know?** SRW wheat produces high yields but relatively low proteins.



### Hard White Wheat

**Uses:** Pan breads and flat breads, hard rolls, tortillas, Asian noodles and whole wheat or high extraction applications.

**Produced in:** California, Oregon, Washington, Idaho, Montana

**Did you know?** Hard white is the newest class of U.S. wheat.



### Soft White Wheat

**Uses:** Produces flour for baking cakes, crackers, cookies, pastries, quick breads, muffins and snack foods.

**Produced in:** Pacific Northwest and to lesser extent in California, Michigan, Wisconsin, New York.

**Did you know?** Low-protein soft white wheat provides a whiter product good for Asian-style noodles and Middle Eastern flat breads.



### Durum Wheat

**Uses:** Durum has a high gluten content. Used for premium pasta products, couscous and some Mediterranean breads.

**Produced in:** Minnesota, Montana, North Dakota, South Dakota

**Did you know?** 70–80 percent of U.S. durum is grown in North Dakota.

*Sources: Minnesota Association of Wheat Growers, U.S. Wheat Associates*