

## Fallow with less tillage

More Plains farmers are saving soil and moisture by using herbicides to control weeds in fallow

By Rollie Henkes

Spray fallow with herbicides and not touch the field again until planting the next crop?

It looks less far-fetched every year.

Chemical fallowing has already been introduced among Central Plains farmers who can follow winter wheat with grain sorghum on dryland. University of Nebraska scientists introduced a chemical fallowing system for this rotation four years ago. They dubbed it "ecofallow," and the name has stuck. So has the practice. Ecofallow took root in west-central Nebraska and it has spread every year.

In ecofallow, wheat stubble is sprayed right after harvest with AAtrex (atrazine) for residual weed control. To kill weeds already present, some farmers sweep-till after harvest. Others use a contact herbicide such as paraquat. Sorghum is planted into the stubble the next spring with minimum-tillage equipment.

Ecofallow generally replaces four or five tillage operations. This saving in tillage has about equaled the cost of the chemical applications in Nebraska tests. The payoff comes in higher yields of grain sorghum. Studies at the University of Nebraska experiment station at North Platte show an average advantage of 23 bushels per acre for grain sorghum on ecofallow. Corn has responded similarly.

Why the higher yields? "Controlling weeds with chemicals rather than tillage saves more moisture for the crop," explains Gail Wicks, a University of Nebraska agronomist. "When the stubble is left standing, it traps more rain and snow, and there's less evaporation. Besides that, herbicides usually give better control of weeds, which sop up moisture and nitrogen."



What about chemical fallowing for wheat/fallow/wheat rotations in drier areas? It has promise, but there are still some problems.

Residual herbicides such as atrazine are trickier to use in fallow preceding wheat because wheat is susceptible to some of these herbicides. Performance of residual herbicides is more erratic in areas of low rainfall. Soil type also affects their performance.

At the University of Nebraska's Panhandle Station near Scottsbluff, wheat on ecofallow usually yields more than wheat on conventional fallow, but not always enough to cover the cost of chemicals, reports agronomist C. R. Fenster.

Despite these problems, Fenster and many other scientists say they believe that ecofallow has a bright future in the small-grain areas of the Plains.

**It's working.** The USDA Great Plains Field Station in eastern Colorado has obtained some of the best experimental results with chemical fallowing. There, soil scientists **B. W. Greb** and **D. E. Smika** report an average yield advantage of 6 bushels per acre from winter wheat grown on fallow in which they relied mainly on herbicides for weed control.

Greb and Smika say one of the most effective programs has been spraying small-grain stubble right after harvest with atrazine for long-term weed control, and with paraquat for control of existing weeds. This treatment keeps weeds in check through about June of the following year. From then until seeding the next wheat crop, they control weeds with stubble-mulch tillage. Two passes are usually enough. A deep-furrow drill seeds wheat directly into the stubble.

Tests show that this system stores an average of about 1½ inches more moisture than stubble-mulch tillage.

"We've cut the tillage down to two operations, compared to four to seven with conventional fallowing," says Greb. "In addition to saving moisture, it saves soil, time, and fuel."

Some scientists say they've found that small-grain seeding equipment available today isn't well adapted to chemical fallowing because it can't cut through heavy residues. Also soils with a high clay content may become brick hard during fall and are nearly impossible to penetrate with conventional drills without prior tillage.

Greb reports that in eastern Colorado, the combination of chemicals and tillage leaves about 2,500 pounds of residue per acre on the surface. He says researchers have had no trouble seeding through this amount of residue with a hoe-type deep-furrow drill.

Greb says more farmers in the Plains should be using deep-furrow drills for winter wheat. The ridges they leave hold snow and protect wheat seedlings. "Limited tillage and deep-furrow drilling leave a lot of clods," says Greb, "but we like clods around here. Only a little fine soil is needed to cover the seed in the bottom of the furrow, but the more clods in the ridges the better. They anchor straw and help resist wind and water erosion. They also provide a poor environment for weeds. I think if farmers would use chemical fallowing, coupled with limited tillage and deep-furrow drilling, it would make erosion as obsolete as smallpox."

**New label.** So far, atrazine has only been used experimentally in wheat/fallow rotations, but farmers in some areas may have a chance to try it for

the first time this year. The AAtrex brand of atrazine is expected to receive label clearance this summer for use in fallow preceding wheat. According to representatives of CIBA-GEIGY Corp., which markets AAtrex, the label for this year would apply only to Colorado, Nebraska, Kansas, South Dakota, Wyoming, and eastern Montana.

Bladex, another triazine herbicide, is already cleared for use in fallow in these states: Kansas, Nebraska, North and South Dakota, Colorado, Wyoming, Montana, Washington, and Oregon.

Tests show that Bladex is generally safer to use than atrazine because it doesn't persist as long in the soil. Wheat can be planted nine months after a fall application of Bladex, or four months after a spring application. But more supplementary tillage may be needed with Bladex.

Roundup has also received clearance for use in fallow. It will compete with paraquat as a non-selective non-residual killer of existing weeds.

Additional herbicides may be available for chemical fallowing as the practice matures. One agronomist predicts that you'll be seeing tank mixes of several herbicides that will give reliable control of a broad spectrum of weeds. Paraquat is already being mixed with both AAtrex and Bladex, giving immediate and residual weed control from one trip over the field.

Also in the offing is new seeding equipment that will plant small grain through heavy residues.

Whatever you want to call it—ecofallow, chemical fallow, or chem-till fallow—chances are you'll be seeing a lot more of it in the future.

*"These clods fight erosion," says B. W. Greb, a leading advocate of less tillage and more chemicals in fallow.*