

New Farming System Catches On

Dryland farmers face many challenges in addition to that posed by highly variable precipitation. Two of the more critical ones are those of making a profit and getting the upper hand on soil erosion.

Agricultural Research Service scientists are helping farmers meet these challenges.

At Akron, Colorado, they have demonstrated for nearly a decade the advantages of including summer crops in rotation with winter wheat over the traditional winter wheat-fallow rotation. Their persistence is paying off for farmers and for the environment.

“Farmers can make more money—up to 35 percent more—in northeastern Colorado. And more importantly, they can better meet more stringent requirements for erosion control,” says ARS soil scientist Ardell D. Halvorson.

“Conservation compliance requirements dictate how much crop residue must be maintained on the soil surface,” he says.

From 1984 through 1988, annual dryland corn acreage ranged from 19,000 to 27,000 in northeastern Colorado. Since 1989, there has been a dramatic increase, with production last year around 80,000 acres.

“Without adding crops like corn, proso millet, or sorghum to their farming operations, many wheat growers would not be able to produce enough soil-holding residue to qualify for government price support programs,” says Randy L. Anderson, an ARS agronomist at the Central Great Plains Research Station in Akron.



RANDY ANDERSON

Proso millet (foreground) and corn near Akron, Colorado.

Farmers have been reluctant to add the summer crops, for fear there would not be enough moisture in their soil. But ARS researchers have shown that there is enough moisture to support both a wheat crop and a summer annual crop, such as corn, after a short no-till, fallow period between crops.

“Over the past 60 years, the traditional winter wheat-fallow system resulted in extensive wind and water erosion. And because there was sometimes more rainfall than needed in a wheat-fallow rotation, saline seeps developed when the water moved beyond the root zones of crops, picking up naturally occurring salts.

“In some cases, the water also moved chemicals like fertilizers and herbicides downward toward groundwater supplies,” says Halvorson. “All this is avoided by the newer farming methods we are developing to decrease the use of summer fallow.”

Halvorson is now at the Northern Great Plains Research Laboratory at Mandan, North Dakota.

Adding the summer annual crop helps control winter annual grassy weeds such as jointed goatgrass, downy brome, and volunteer rye that are a problem in the wheat-fallow rotation. And insect control is often easier, because some problem pests can only live on wheat; they tend to

die out when corn replaces wheat for a year, says Anderson.

Unfortunately, say the researchers, the same positive economic return has not occurred in the southeastern region of the state. Farmers there didn't make more money on a wheat-sorghum-fallow system, despite yields that were 30 percent higher than county averages. This stems from increased production costs—mainly herbicides in the fallow portion of the system.

“Our current research, aimed at using less expensive herbicides in conjunction with limited tillage, is showing promise to boost income for those farmers,” says Anderson.

The researchers are also looking to fine-tune fertilizer applications so minimal amounts can be applied, to better safeguard water supplies and further reduce production costs.

“We know efficient water use by the crops is only possible when nitrogen and phosphorus are adequately supplied,” says Halvorson.—
By Dennis Senft, ARS.

Randy L. Anderson is at the USDA-ARS Central Great Plains Research Station, P.O. Box 400, Akron, CO 80720-0400; phone (303) 345-2259, fax (303) 345-2088.

Ardell D. Halvorson is at the USDA-ARS Northern Great Plains Research Laboratory, P.O. Box 459, Mandan, ND 58554; phone (701) 663-6445, fax (701) 667-3054. ♦