Chemical fallow offers many advantages

Darryl E. Smika, research soil scientist at the U.S. Great Plains Research Station in Akron, Colo., is a confessed believer in chemical fallow, a farm production system in which weeds are controlled with chemicals for efficient production of crops during the entire period following wheat harvest.

Chemical fallow, Smika says, maximizes soil water storage and reduces energy requirements and production costs. He believes the system can be practiced on any kind of soil where conventional practices are now used and is convinced chemical fallow will become the dominant method of managing the Great Plains in the not-too-distant future.

In a true chemical-fallow system, tillage is not used at all. Wheat is planted into the previous crop's stubble with a no-tillage drill after a 14-month fallow period. Growers are gaining some of the advantages of the system by using a limited amount of mechanical tillage only in the late summer just before planting.

Chemical fallow is not a new practice, although it is just now beginning to gain broad acceptance. Research at the Akron station has been going on since the early 1950's, with a concerted effort since 1971. It is these two decades of research results that make Smika and his colleagues so confident about chemical fallow or ecoc-fallow, a sister practice where four crops are obtained in six years.

Their data suggest five requirements must be met to improve water conservation and erosion control in chemical fallow:

- Weed control using herbicides, not tillage, for the entire fallow period harvest to planting interval can reduce weeds 80 percent from 2 to 3 inches of water per day and up to 27 pounds of nitrogen per acre. Tillage operations also increase water loss through evaporation by 2.5 to 3 percent per operation.

- Stubble must be left standing over winter to hold snow.

- Straw mulch must be left on the soil surface during these times to absorb rangeland impacts, which reduces puddling, and cuts evaporation losses by insulating soil.

- Hard soil clods should be left on the soil surface to resist wind erosion, help anchor mulches, slow run-off, and protect young wheat plants.

- Soil must be managed to retain enough water in the seedbed to germinate seeds.

Farmers adhering to these requirements can expect to increase yields nine bushels per acre on the average and get almost total protection from wind and water erosion, according to Smika.

Average losses to erosion under conventional systems on the Great Plains are five tons per acre per year, or 1/32 of an inch of topsoil, he says. Research also shows after seven years or so chemical fallow, soil chemical properties are improved, and with additional years of the land return to the condition it was in when first broken out of soil 100 or more years ago.

Controlling moisture-robbing weeds is the cornerstone of a chemical-fallow program, according to Smika, and is essential to success. "Paraquat and atrazine are the chemicals used for research 23 years ago, and are the basics of chemical fallow today," Smika says, "although new herbicides have been developed in recent years for specific purposes in the system.

A typical application would be Ortho Plus Paraquat Plus and atrazine immediately after harvest in July on those fields where atrazine can be used, Smika says. Atrazine is not recommended on very sandy or high clay soils or soil with high pH. But enough residual atrazine have been developed that can be substituted for atrazine. 2,4-D can also be used for effective weed control and for spot treatment.

In the fall, farmers should be on the lookout for wild sunflower and Russian thistle, the major broadleaf problems, and winter annual grasses such as downy brome and jointed grass that mature about the same time as wheat. Ticklegrass, stinkgrass, and green foxtail may also be evident in the fall after harvest.

In the spring, control measures should be directed at tough, prolific weeds such as lambquarters and pigweed. Smika says, while Koko germinates all year and should be regarded as a constant threat.

Smika estimates 15% of the fallow land on the Great Plains is under chemical fallow, and the percentage is increasing each year. "But there is still a great deal of resistance to the use of herbicides instead of tillage to kill weeds," he says. "Farmers have been filling the soil for thousands of years, so it's instilled in them.

He figures a young farmer can buy the equipment he needs to farm chemical fallow for one fifth of the cost of tooling up for conventional farming. "But if you're a third generation farmer, it's likely that his grandfather, who probably owns the land, and his father have been plowing the ground for 40 or 50 years," Smika says. "It's going to run into a lot of resistance.

Reducing costs with better

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But a new, energy-saving system can cut your cooling costs by 30 to 50 percent. The system is called "solar," and it takes advantage of the fact that the sun is naturally a powerful source of heat.

In this system, the sun's heat is used to warm your home. The system consists of a collector, a storage tank, and a heat pump. The collector is a black, plastic pipe that is laid on the roof of your house. The water in the pipe is heated by the sun's rays and then flows to a storage tank, where it is kept hot for later use.

The heat pump is a mechanical device that transfers heat from the storage tank to your home. It is similar to a refrigerator in that it moves heat from one place to another, in this case from the storage tank to your home. The heat pump uses electricity to operate, but it can transfer much more heat than the electricity it uses, so your cooling costs are reduced.

The system is very effective in reducing cooling costs. According to the manufacturer, the system can reduce your cooling costs by 30 to 50 percent. This is because the sun's heat is a free source of energy, and the system is designed to use it efficiently.

The system is also very efficient in terms of energy. It is estimated that the system uses about 10 percent of the electricity that would be used by a conventional air conditioning system. This is because the sun's heat is a free source of energy, and the system is designed to use it efficiently.

The system is also very easy to install. It can be installed on any roof, and it does not require any major changes to your existing air conditioning system.

In conclusion, the solar system is an excellent way to reduce your cooling costs. It is energy-efficient, easy to install, and it takes advantage of the fact that the sun is naturally a powerful source of heat. If you are looking for a way to reduce your cooling costs, the solar system is an excellent choice. 