

# Cover Crops Save Soil, Water, Reduce Weed Pressure

RACINE, Wis. — You may be missing out on some real profit potential if soil conservation is the only thought that comes to mind when you hear the term "cover crop."

While soil conservation is a major benefit of winter cover, it's only one of several. Further, soil conservation is a long-term goal that doesn't have an immediate payback.

As part of a planned crop rotation, cover crops can pay immediate dividends, insists Wilbur Frye, University of Kentucky soil scientist. "It's the short-term benefits that make cover crops economically attractive to most farmers," Frye says.

Easier weed control is one important short-term benefit, adds Doug Worsham, North Carolina State University weed scientist.

A good cover crop can shade or crowd out weeds. But Worsham and his associates at North Carolina State, and researchers at Michigan State University as well, have shown there's much more to it than that.

Scientists at both universities recently have found that cereal grains, especially rye and wheat, produce chemicals which are toxic to some weeds. The process, whereby one plant attacks or suppresses others growing nearby through chemicals, is called allelopathy.

To show the likelihood that allelopathy exists in small grains, North Carolina State researchers isolated chemicals from the roots and straw of rye. They found rye had some "natural herbicides" which inhibit root and shoot growth in redroot pigweed and lamb-quarter. And to a lesser extent, these natural herbicides also

suppress the growth of some grassy weeds.

They also isolated a different chemical in wheat, which is particularly toxic to morning glory and prickly sida.

Worsham admits the jury is still out on practical application of this information on a wide scale. "More research is under way. But we do know that helping suppress some difficult-to-control broadleaf weeds is one more reason we can recommend no-till planting into cover crops in North Carolina," he says.

Even if there is no allelopathic effect involved, a good cover crop is easier to control with herbicides than some of the weeds it will crowd out, adds Jim Herbek, a University of Kentucky agronomist.

### Cut nitrogen costs

Additionally, Herbek and Frye agree that some cover crops can significantly reduce nitrogen fertilizer costs for corn growers.

Researchers at Kentucky and the University of Tennessee have studied several legumes, looking for the one which provided the best cover while adding nitrogen to the soil. Crimson clover, big flower vetch and some more exotic crops like Austrian winter pea and caley pea (or rough pea) have all been evaluated. Agronomists in both states agree that hairy vetch is the best bet at this time.

In good years, hairy vetch has provided nearly 90 pounds of nitrogen equivalent for a subsequent corn crop. In a five-year Kentucky study, corn no-till planted into hairy vetch cover yielded an average of 105 bushels an acre, without benefit of nitrogen fertilizer.

By comparison, corn no-till

planted into corn residue, with no cover crop and no nitrogen fertilizer applied, yielded only about 60 bushels an acre.

When 90 pounds of nitrogen was applied per acre, yields were 109 bushels per acre for corn planted in corn residue and 145 bushels an acre for corn planted into hairy vetch. Frye attributes the entire 36-bushel increase to hairy vetch.

He says the annual cost of establishing the hairy vetch cover crop was about \$33 an acre. With this in mind, corn prices would have to drop below \$1 for the 36-bushel yield increase to be unprofitable.

When nitrogen was applied, yield response was greater where a cover crop was grown than where corn was planted directly into crop residues, Frye says. This was true even for rye, which has no nitrogen-fixing ability.

Further, yields were increasing annually in plots where hairy vetch cover crops were used every year, regardless of the nitrogen fertilizer rate. Yields declined every year where corn was planted in residue cover and no nitrogen was applied. Where nitrogen was applied to corn planted in residue cover, yields were steady over the five-year study.

### Other benefits

In addition to soil conservation, weed control and nitrogen fixation, there are other benefits from using cover crops.

For example, cover crops add organic matter to soil through above-ground vegetation and root systems, as well. They improve soil fertility by bringing minerals up from the subsoil.

Cover crops can recycle applied nutrients, too. A small grain cover crop, for example, can use applied

nitrogen and then release it later as the plant residue decomposes.

Another benefit is improved soil structure. Deep-rooting legumes may actually open channels through soil pans that can be used later by corn roots seeking nutrients and moisture.

Cover crops also may help increase soil moisture content by slowing runoff, increasing infiltration and decreasing evaporation from the soil surface. However, the cover must be controlled in time to avoid becoming a drain on soil moisture.

While advantages remain fairly consistent throughout the nation, most experts say it's impossible to recommend one cover crop for all areas. Variations in growing season length, soil types and even factors of a cover crop.

Overall, cover crops are predominant in the South following corn or soybeans. In northern areas, use is limited to fields after harvest of short-season crops like potatoes, sweet corn, snap beans or dry beans.

Herkbek feels farmers in the central and northern Corn Belt region also could benefit from cover crops on soybean fields, where erosion tends to be a problem. He suggests aerial seeding into standing soybeans to overcome the problem of late establishment following harvest. Herbek says Kentucky researchers have had good luck with aerial seeding of wheat, rye and hairy vetch.

Even without some of these additional benefits, cover crops for soil conservation alone make sense. USDA Soil Conservation Service reports winter cover can cut erosion by as much as 50 percent, depending on slope, tillage, residue cover and other factors.

Whatever your reason for trying cover crops, be sure to contact your local Extension and/or Soil Conservation Service advisers. They can provide you with more information on recommended crops, seeding rates and practice for establishing cover crops in your area.

## Maryland To Host First Atlantic National Angus Show

ST. JOSEPH, Mo. — Plans for the first ever Atlantic National Angus Show have been finalized. The show will be held May 23-25, 1987 at the Maryland State Fairgrounds in Timonium.

During the three-day event, a junior show will start the activities off on Saturday, May 23. The show will include heifers and registered Angus steers. An open female show will follow on Sunday, May 24 with bulls to be shown on Monday, May 25.

The Atlantic National, governed

by a board of trustees, headed by chairman Joe Calderazzo of GH2 Angus, York, selected Mike Jones, West Point, Georgia, to serve as show manager.

The board of trustees works with an executive committee of some 16 nationally known Angus breeders in establishing direction and policy for the Atlantic National.

For additional information contact Mike Jones, Route 1, Box 323, West Point, Georgia 31833, phone 404/884-6592.



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