Weed Control With Winter Rye

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J.L. Helm, Extension Agronomist
R.K. Zollinger, Extension Weed Specialist

Winter rye is the most competitive small grain crop for weed control in North Dakota, and use of this biological tool in a planned weed management program is a good practice. Rye should be part of a holistic weed control approach that includes other practices such as crop rotation, tillage, herbicides and planting weed-free seed. For some producers and on some weedy fields, rye plus cultural practices can provide very cost-effective weed control. Rye is utilized by organic crop producers who do not want to use synthetic chemicals as part of their weed control program.

Winter rye provides much more effective weed control than spring-seeded small grains and more than winter wheat. Late summer cultivation to prepare a proper rye seedbed kills many weeds. Rye germinates and grows rapidly when planted early in September when soil temperatures are high and if moisture conditions are adequate. Rye seedlings with their rapid growth tend to compete with and smother germinating weeds in the fall. Early vigorous spring growth provides strong competition to spring-germinating weeds. Likewise, the early rye harvest helps to prevent weeds from maturing and shattering seed. This is especially true for a weed like wild oats.

Chemical compounds that inhibit weed seed germination have been extracted from rye plant residues in laboratory experiments. However, similar chemicals can be extracted from residues of many plant species that are not especially competitive with weeds. The importance of these chemicals in field conditions has not been clearly demonstrated. NDSU weed scientists have conducted research on the potential allelopathic (production of substances toxic to weeds) effects of rye. They did not find any demonstrable allelopathic effects and concluded that competition was the major influence of rye on weed populations.

Wild oat, ragweed, dandelion, common lambsquarters, redroot pigweed, Canada thistle and quackgrass are weed species reported to be controlled by rye. These and many other weeds have their growth retarded by vigorous growth of the rye plant. Mature plant residue after harvest continues to shade the soil surface reducing weed seed germination in late summer.

Rotations

A rotation of fallow-winter rye-fallow-spring grain will effectively reduce annual and perennial weed numbers. Corn, millet or buckwheat can be substituted for the second fallow to increase proportions of cash crop. Fallow can be reduced and cropping increased in periods of normal or above normal precipitation. For perennial weed problems, the fallow-winter rye-fallow-spring grain or at least spring grain-winter rye-fallow-spring grain rotation should be considered. Do not follow winter rye with winter rye or winter wheat in a rotation because of volunteer rye problems.

Production

See NDSU Extension Circular A-916, "Rye Production and Utilization," for information on varieties, cultural practices, marketing and utilization.

Conclusions

Winter rye is the most competitive grain crop and is effective in controlling weeds. Rye growth and competitive ability minimizes losses from weed competition and also greatly reduces seed production by annual weeds and root growth of perennial weeds. Rye in combination with fallow can provide good to excellent weed control. While producing rye has not been as profitable as wheat in recent years, its attributes of additional weed control make it a valuable management tool.

Producers who do not wish to purchase or use herbicides should use rye as a regular rotational crop.

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