

Soil nitrate levels, a major source of groundwater contamination, have been reduced markedly by inter-seeding a cover crop of rye in continuous corn, according to studies done by the University of Maryland's Wye Research and Education Center. Rye, a small grain cereal grown similar to wheat, uses its extensive root system to pick up residual nitrates that otherwise would be susceptible to leaching. Rye holds real promise that addresses the nitrogen problem while still allowing agriculture to remain viable (Brinfield, 1989).

Used as a fall trap crop for residual nitrogen, rye can take up more than 160 pounds of nitrogen. Rye has the ability to grow more rapidly in the fall, produce more biomass, and therefore accumulate more nitrogen than other cereal crops. It can take up more than twice as much nitrogen as oats, barley, or wheat (Costa, 1989).

It is more cold tolerant than wheat or barley and therefore can grow in colder temperatures in late fall. Rye can stand winter temperatures down to 40 degrees below zero. Rye can grow when temperatures are only a few degrees above freezing (Groffman et al. 1987).

The carbon to nitrogen ratio for young rye plants is 20:1 but at maturity that ratio goes to 350:1. In comparison, legumes have a 25:1 ration and corn reaches 40:1 ("Organic Matter in Nursery Soils," 1981). A mature rye green manure crop plowed under will temporarily tie up a much larger amount of soil nitrogen, compared to legumes or corn, during the natural decomposition of the residual organic matter.

The allelochemicals released by rye deter growth of many annual weeds in the following crop. Killed-back rye provides for good control of morning glory, sicklepod, prickly sida, cocklebur, pigweed, lambsquarters and ragweed (Worsham, 1989).

In a two-year Wisconsin study of a rye to soybean rotation, harvesting rye as a forage crop increased net returns dramatically. Mowing and harvesting rye during the heading stage netted \$377 per acre without herbicide and \$489 per acre with the use of herbicides when added to soybean production. Soybeans planted into mowed rye yielded well only when rye was mowed at the pollination or heading stage. Rye often retillers if it is mowed earlier. Yields of soybeans were greatly

reduced after rye was chisel plowed, as the allelopathic effect on weeds is reduced or lost (Doll, 1991).

Caution should be taken with the rotation of rye in areas with large acreages of wheat. Rye is an aggressive reseed and can become a pest on fields with a predominance of wheat in the rotation.

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CREDITS

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