



*Top.* A rye living mulch ready to be killed in spring prior to seed germination (*left*) and a field already treated with herbicide (*right*).

*Middle.* Rye emerging through a wheat straw mulch was sprayed with herbicide before crop emergence.

*Bottom.* After the rye was treated with herbicide, fire was used to remove the wheat straw that protected crop seeds from wildlife predation during winter.

# Use of Living Mulches to Protect Fall-sown Crops

| Bob Hawkins

## ABSTRACT

Sowing rye seeds along with crop seeds in a bareroot nursery in fall protects the beds from erosion and predation. For large-seeded species, an additional covering of straw further discourages predation from deer and squirrels. The rye is killed in early spring and the straw mulch can easily be removed in early spring with controlled burning.

## KEY WORDS

Fagaceae, Juglandaceae, seeds, bareroot nursery

## NOMENCLATURE USDA NRCS (2004)

To help insulate seedbeds and prevent erosion during winter months, we sow rye seeds along with our tree and shrub seeds at the time of fall planting. We grow living mulch on all of our fall-sown species, including the oaks (*Quercus* L. [Fagaceae]). For small-seeded species such as black cherry (*Prunus serotina* Ehrh. [Rosaceae]), green ash (*Fraxinus pennsylvanica* Marsh. [Oleaceae]), and eastern white pine (*Pinus strobus* L. [Pinaceae]), we spread 89 to 101 kg/ha (80 to 90 lb/ac) of rye seeds with an easy flow fertilizer spreader just before sowing, then incorporate the seeds into the seedbed (6 to 12 mm deep [0.25 to 0.5 in]) by means of a Kulti-Rotor bed-former (Bartschi-Fobro, Grand Haven, Michigan). For large-seeded species such as the oaks and the Juglandaceae, for example black walnut (*Juglans nigra* L.), shellbark hickory (*Carya laciniosa* (Michx. f.) G. Don), and pecan (*Carya illinoensis* (Wangenh.) K. Koch), we evenly distribute 89 to 101 kg/ha (80 to 90 lb/ac) of rye on the surface of the seedbed by means of a Gandy box fertilizer spreader, built in conjunction with our oak seeder. The rye and the crop seeds are sown simultaneously and are covered immediately by means of a chain drag at the rear of the planter. Upon completion of this process, all seeds are covered with approximately 6 to 12 mm of soil (0.25 to 0.5 in). The rye emerges in the fall and is allowed to grow on the seedbeds until late winter or early spring when we spray it with an herbicide. If the crop seeds have not yet emerged from the soil we use paraquat or glyphosate, but if emergence has occurred we use Fusilade® to prevent injury to developing seedlings. All herbicides are used at manufacturer rates and by following directions on the label.

In addition to the rye, we also cover all of the large-seeded species with a 5- to 7.5-cm-deep layer (2 to 3 in) of clean wheat straw immediately after sowing. The rye will sprout in the fall and grow up through the straw, making a very dense mat that not only provides protection from extreme low temperatures but also provides protection from deer and squirrel predation. The late winter or early spring paraquat or glyphosate spray prior to crop seed emergence gives us a quick burndown of the rye as well as any winter annuals that have become established. Once the herbicide has acted, we use a controlled burn to remove as much straw as possible from the seedbeds. Sometimes, because of moisture in the straw, we must burn the field a couple of times as the straw dries in order to remove the mulch. These secondary burns will remove approximately 90% of the straw on the seedbeds. Straw remaining in thick clumps should be removed by hand as to not hinder germination, whereas thin layers do not interfere with emergence of these large-seeded species. The burn is quick and does not get hot enough to damage exposed seeds, but it must be completed before seedling emergence begins. If need be, any fire can be quickly extinguished with the irrigation system.

## REFERENCE

USDA NRCS. 2004. The PLANTS database, version 3.5. URL: <http://plants.usda.gov> (accessed 15 Sep 2004). Baton Rouge (LA): The National Plant Data Center.

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