# Use of Wheat as a Living Mulch to Replace Hydromulch for Fall Sown Seedbeds[1]

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**Abstract –** Wheat is used as a living mulch for fall sown seedbeds in place of hydromulch. Methods of sowing and management along with the advantages and disadvantages are discussed.

## INTRODUCTION

Nurserymen of the Indiana Division of Forestry use wheat to protect fall sown seedbeds instead of using the traditional hydromulch. Wheat as a living mulch has many advantages as listed in Table 1. Possible probems are listed in Table 2.

Three basic methods are used to establish wheat depending on sowing method and seedling emergence characteristics. See table 3 for specific information on each tree species.

### Method 1

For species with small seed that are sown with a pine seed drill, wheat seed is uniformly mixed with tree seed in a 1 to 1 ratio by weight. The seed drill is calirated as usual with the knowldge that 1/2 of the seed is wheat by weight.

Our nurserymen use a calibraion method based on weight. Calibration weights and good seed per pound data are run through a very simple computer program that produces information that allows unskilled personnel to calibrate the planter and permits easy monitoring of actual sowing rates. This method has reduced calibration time by 50 to 80% and allows calibration of tree seed-wheat mixes to be completed without extra effort.

### Method 2

For seed sown with a walnut or oak planter, the tree seed is sown first, then wheat is spread over the sown beds at 2 bushels per acre using an Ezee flow spreader. The seed is covered with a rake or bedformer as appropriate for the tree seed sown.

### Method 3

For seed that has a problem germinating if wheat is sown with the seed, the wheat is first broadcast over prepared beds and raked to cover. Then, the tree seed is sown by hand, broadcast, or drill sown and covered as appropriate.

The final step in using wheat as a living mulch is killing it with a herbicide in late winter or early spring. A general rule for timing of herbicide application is that wheat should be treated in late winter for small seeded tree species. This allows the wheat leaves and roots to begin decomposing by the time that seedling emergence begins. In southern Indiana, the herbicide would be applied to the wheat in February. For large seeded species the wheat is treated 1 to 2 weeks before seedling emergence. If tree seed is sown at a shallow depth (less than 1/2 inch) and the wheat stand is not heavy, the wheat can remain up to and after tree seedling emergence as long as a selective herbicide is used. The longer the wheat is allowed to grow, the better it functions in erosion and frost protection. This also delays emergence of tree seed to some degree.

Choice of herbicide used to kill the wheat will depend on the following factors. First, the pesticide label must be followed. Second, if the tree seed has not begun to emerge, a broad spectrum herbicide that has no soil activity can be used with the result that wheat and any emerged weeds will be killed. This is a major advantage if

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winter annuals have infested the seedbeds. Third, if the tree seed have begun to emerge a herbicide that will not damage the tree seedlings must be used.

Glyphosate, Paraquat, and Fluazifap-P-butyl have been used at the Vallonia Nursery. Paraquat and Glyphosate must be applied before tree seedling emergence. Fluazifap-P-butyl can be applied to many species of emerged tree seedlings. Be sure to read the label as some herbicides should be applied before the wheat reaches a certain growth stage.

**Table 1. Advantages of Wheat as a Living Mulch.**

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|---|---|
| 1 | Prevents wind and water erosion. |
| 2 | Protects seed from extreme winter temperatures. |
| 3 | Reduces frost heaving of seed. |
| 4 | Reduces seed loss due to predation by birds, squirrels, and deer. |
| 5 | Reduces nutrient leaching in the fall and winter. |
| 6 | Delays emergence of tree seedlings long enough to avoid most late spring frost. |
| 7 | Reduces soil compaction and adds organic matter to the soil. |
| 8 | Permits fall sowing on slopes that would otherwise erode severely. |
| 9 | Soil shading during mid-winter reduces possibility of seed germination during "January Thaw" weather. |
| 10 | Wheat is an indicator of soil fertility in spring before deficiency symptoms can be detected in tree seedlings. |
| 11 | Cost savings compared to hydromulch are between $400.00 & $600.00 per acre. |

**Table 2. Potential Problems with Wheat as a Living Mulch**

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|---|---|
| 1 | Wheat must be killed at the correct time, otherwise seedling emergence will be reduced or delayed longer than desirable. |
| 2 | Sowing must be done early enough in the fall for the wheat to become well established before cold winter weather occurs. |
| 3 | If meadow mice are common in adjacent areas, these rodents may move into seedbeds if the stand of wheat is heavy. |

**Table 3: Methods of Using Wheat as a Mulch for Species Grown at the Vallonia Nursery**

| Species | Method | Sowing Dates | Herbicide Application Dates |
|---|---|---|---|
| **Black Cherry** | 1* | mid September to late October | late January to late February |
| **Black Gum** | 2 | mid September to late October | late January to late February |
| **Black Oak** | 2 | mid September to late October | mid march to mid April |
| **Black Walnut** | 2 | mid September to late October | mid march to mid April |
| **Bur Oak** | 2 | mid September to late October | mid march to mid April |
| **Cherrybark Oak** | 2 | mid September to late October | mid march to mid April |
| **Green & White Ash** | 1 or 3 | mid September to late October | late January to late February |
| **Pecan** | 2 | mid September to late October | mid march to mid April |
| **Persimmon** | 2 | mid September to late October | mid march to mid April |
| **Red Oak** | 2 | mid September to late October | mid march to mid April |
| **Shingle Oak** | 2 | mid September to late October | mid march to mid April |
| **Swamp Chestnut Oak** | 2 | mid September to late October | mid march to mid April |
| **Swamp White Oak** | 2 | mid September to late October | mid march to mid April |
| **Tuliptree** | 3 | mid September to late October | late January to late February |
| **Washington Hawthorn** | 1 | mid September to late October | late January to late February |
| **White oak** | 2 | mid September to late October | mid march to mid April |
| **White pine** | 1 | mid September to late October | late January to late February |