

Panel Discussion: Application of Living Mulch for Spring-Sown Loblolly Pine

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In: Dumroese, R. K.; Riley, L. E.; Landis, T. D., tech. coords. 2005. National proceedings: Forest and Conservation Nursery Associations—2004; 2004 July 12–15; Charleston, NC; and 2004 July 26–29; Medford, OR. Proc. RMRS-P-35. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

Keywords: bareroot seedling, cover crops, herbicides

Those who grow hardwood seedlings are familiar with fall sowing seeds and using rye, wheat, or oats to over-winter the crop. Throughout this paper, reference to rye is GRAIN, NOT GRASS (do not use rye grass). The rye stabilizes and insulates the beds while retarding predation and weeds. Normally sown at 2 bushels/ac (5 bushels/ha), the rye is killed with Roundup™ before the seeds germinate (around mid-February), allowing the seeds to germinate and emerge unimpeded. Light-seeded, fall-sown hardwoods often necessitate only 1 bushel/ac (2.5 bushels/ha).

As an outgrowth of this, we experimented in 1999 on 9 beds using an application rate of 2 bushels rye/ac (5 bushels rye/ha) for spring-sown loblolly pine (*Pinus taeda*). The results were so favorable that we expanded to 0.5 ac (0.2 ha) in 2000. Finding no problems, we expanded this application to half our loblolly pine crop in 2001.

The use of pine bark mini-nuggets on our whole loblolly pine crop in 2001 would have cost us approximately U.S. \$30,000. The same area using the rye would have cost us U.S. \$400. An equally important savings is the application time. A broadcast seeder can cover 5 beds with 1 pass; the more conventional bark application requires 1 pass per bed with a manure spreader that must return to the bark pile to be loaded between applications.

There were several unanticipated findings:

1. There seemed to be some positive partial shading of seedlings in early days.
2. No mulch floated off.
3. There were no introduced weeds (as would have occurred with mulch).
4. The weeds were shaded out by the rye.
5. Rye can stand Goal™ pre-emergent to a degree. We generally did not use Goal™ when using rye.
6. The dead thatch lasted until crown closure.
7. The seedlings achieved the same density as those grown without the living mulch.
8. The seedlings were the same quality at lifting as those grown without the living mulch.
9. As a cover crop, rye was better than oats, which was better than wheat.

A negative finding was that the seedlings were about 2 weeks behind in reaching crown closure. We attributed that to nitrogen deficiency caused by microbial action on decaying rye root systems.

Other uses of living mulch include stabilization of the sawdust applied over sown pine seed and the over-wintering of white pine (*Pinus strobus*) between the 1+0 and 2+0 years. **(When killing the rye before the spring growth of the 2+0 white pine, it is important to mow the rye at “Tree-Top” level approximately 3 days after herbicide application but before it falls over. This will prevent a thatch from forming over the top of the seedlings. The winter rye will be tall and present an impenetrable thatch if this is not done.)**

The steps for using living mulch on spring-sown loblolly pine are:

1. Level the ground.
2. Broadcast the rye at an application rate of 2 bushels/ac (5 bushels/ha).
3. Build the seedbeds.
4. Sow the pine seeds.
5. Kill the rye with Poast®. Although it may appear that the rye is too abundant when viewed from ground level, an overhead view would show that this is not so. It is all right if the rye is taller than the seedlings as long as the dead rye does not form a thatch over the seedlings when it falls over.
6. The pine seeds must be covered with soil or at least pressed in.

Some alternatives to consider:

1. Wait 2 to 3 days after building beds to sow pine seeds to give the rye a head start in germination and growth.
2. If you decide to use Goal™ pre-emergent, increase the rye to 3 bushels/ac (7.5 bushels/ha) and/or sow the rye after the bed is formed instead of before. The rye germinates very poorly if it is not covered or pressed in.