

Weed Control with Herbicides or Fumigation at a Forest Nursery

South, D.B. 1980. Weed control with herbicides or fumigation at a forest nursery. Ala. Agr. Exp. Sta. Highlights Agr. Res. 27(1):14.

Weeds are considered the most troublesome pests in forest nurseries, and their control can often constitute a large portion of the total cost of seedling production. In the past, methyl bromide fumigation has been one of the major techniques used in forest nurseries to control weeds. In 1975, southeastern forest nurseries expended more than \$370,000 for methyl bromide fumigation. Just recently the cost of fumigation has increased and the price for fumigation can now exceed \$900 per acre.

In addition to being expensive, there are other disadvantages to using methyl bromide fumigation. For fumigation to be effective, several requirements must be observed. The soil surface must be covered with a tarpaulin to prevent escape of the methyl bromide gas. Soil temperature at the 6-in. Depth should be above 50 degrees F. The soil should be porous and loose with no lumps or clods. And, because the moisture content of weed seeds must be high for good control, the soil should be moist but not too wet for gas movement.

Since many nurseries fumigate in the spring, when there are frequent rains, fumigation and planting are often delayed because soils are too wet. The aeration period after tarpaulin removal varies from 2 days to 2 weeks, but after this interval there is no residual weed control activity. Weeds can become reestablished on fumigated soil if the area is recontaminated by weed seed in straw mulches, nonfumigated soil, or wind-carried seed. Methyl bromide is toxic to humans, and personnel working in forest nurseries have been sent to hospitals due to methyl bromide exposure.

In contrast, the use of a herbicide such as Goal (oxyfluorfen) is less expensive than methyl bromide, is easier and safer to apply, and is as effective for control of annual weeds. The cost of an application of this herbicide is less than \$20 per acre. The condition of the soil is not critical since application is usually made just after sowing. Although safety precautions should be taken when using Goal, as with any herbicide, this material is much less toxic to humans than methyl bromide.

In 1979, an experiment was conducted at a new forest nursery in South Carolina to determine the differences in weed control obtained from spring or fall fumigation with methyl bromide and the herbicide, Goal. The main treatments were: (1) no fumigation; (2) November fumigation with methyl bromide (with 33% chloropicrin) at 350 lb. per acre; and (3) March fumigation with methyl bromide (with 33% chloropicrin) at 350 lb. per acre. Each main treatment was split, with half receiving a preemergence application of Goal at 0.5 lb. active ingredient per acre in April. Weed seedlings were counted on June 14.

In the untreated controls, the main weed species were Florida pusley, carpetweed, and yellow nutsedge, see table. Because the weather conditions during fumigation were good, both in the spring and fall, little seasonal difference in weed control was observed with fumigation. Control of yellow nutsedge, Florida pusley, and carpetweed was excellent with fumigation, but control of cutleaf eveningprimrose was only fair. Since the seed of large crabgrass was apparently blown onto the treated area after fumigation, little control of this species was observed.

Control of the annual weeds was excellent with the herbicide-only treatment. Herbicide control of crabgrass, carpetweed, Florida pusley, and cutleaf eveningprimrose was as good or better than from fumigation. However, yellow nutsedge was not controlled since Goal does not control perennial weeds.

It is apparent that Goal controls annual weeds at this nursery and is more effective, less expensive, easier to apply, and safer to use than methyl bromide fumigation. The use of methyl bromide can be justified when attempting to control high populations of perennial weeds, such as nutsedge, or when pathogens are a problem. Through the efforts of the Auburn University Forestry Chemicals Cooperative, Goal has been registered by EPA for use on southern pine species grown in forest nurseries.