

WEED CONTROL IN LINERS AND FIELD TRANSPLANTS

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The weed control methods that will be covered here are ones that have been used by Mid-Western Nurseries at our Tahlequah, Oklahoma growing facility. Tahlequah is in the northeastern part of the state and most of our soils are loam to silt loam and clay loam. The field soils average about 2% organic matter. Our annual precipitation is 46 inches.

WEED CONTROL IN SOFTWOOD CUTTING BEDS

All of our softwood cuttings are stuck in plastic-covered bowhouses 12 ft wide and 96 ft long. There is a narrow walkway down the center of each house. The growing medium in the beds is a mixture of sand and bark. The beds are reused from year to year. After a bed is used, it is cleaned up and renovated if needed. The soil is loosened with a Troy-bilt rototiller. This tiller works well because the handle can pivot away from the outside bows.

The beds are then fumigated with methyl bromide (MeBr) containing 2% chloropicrin at the rate of 1½ lb/100 sq ft. We used to use 1 lb- or 1½ lb-cans of MeBr but now use 200-lb cylinders because of the cost savings. The 200-lb cylinder and the accompanying bottle of nitrogen used to pressurize the MeBr are mounted on a small trailer that can be pulled from house to house by hand. The bottle cradle is hinged so the bottles may be layed down when the trailer is being moved. The trailer remains outside the bowhouse with three hoses from a manifold on the MeBr bottle leading into evaporating pans in the cutting house.

We use one sheet of plastic to cover the whole cutting bed including the middle walkway. The plastic is covered from the inside with soil so that all the soil is exposed to the fumigation treatment. We find it helps to shake the plastic to trap air underneath. The soil temperature must be at least 55° at the 3-inch depth when fumigation is initiated. With our manifold pressure and orifice size, leaving the manifold valves open for 60 seconds gives us the correct rate in this size house. After fumigation the plastic is left on the bed for at least 24 hours if the soil temperature is above 70°F and 48 hours if the soil temperature is below 70°F degrees. Then the soil is allowed to air out undisturbed for another 48 hours before sticking begins. On beds containing evergreen cuttings stuck and rooted

early, we apply Ronstar or Scotts Ornamental Herbicide I (oxadiazon) (1) 4 lb AI/A in July for spurge control. It is important to keep the area around the houses clean to prevent weed seeds from blowing into the cutting beds.

WEED CONTROL IN SEED BEDS

Our field seed beds are slightly raised beds 4 ft wide and 300 to 350 ft long. We have the equivalent of over 10 miles of seed beds. The soil is mostly a silt loam with some areas silty clay loam. We fumigate these seed beds prior to planting with MeBr at 350 lb/A. The seed beds are thrown up with a bed former then worked down slightly with a section of a rotary hoe to break up clods. The MeBr is injected into the soil with a fumigation implement that covers the bed with plastic at the same time. The fumigation rig has 5 tines through which the MeBr is injected 6 inches deep into the soil. The plastic is 66 inches wide 1¼ mil (0.00125 inches) thick, embossed for additional strength. I prefer black plastic to clear plastic for additional warming of the soil on cool sunny days

After fumigation the plastic is left on the bed at least 48 hours. After the plastic is removed, we let the soil air 3 to 4 days before planting. The unplanted, non-fumigated edges of the beds may still be infested with weed seed. We spray these edges with Surflan (oryzalin) (2) 2 lb AI/A.

It is very important that the soil not be too dry nor too wet when fumigated. If the soil is too wet, the fumigant will not move through the soil; if too dry, the fumigant will not penetrate the clods.

MeBr fumigation does a good job of controlling grasses, but seeds of some broad-leaved plants have hard seed coats or germinate from deep in the soil and may not be totally controlled. These include velvet-leaf, morning glory and pigweeds. Only partial control can be expected of nutsedge.

Methyl bromide will cost us \$9.00/bed (\$322/A), plastic \$8.50 (\$200/A), and labor about \$5.00 (\$120/A). Two people can generally cultivate between the beds and do all the necessary weeding and hoeing during the summer.

WEED CONTROL IN FIELD TRANSPLANTS

All soils which are to be planted to field liners are sprayed with Treflan (3) EC 1 qt/A preplant incorporated if johnson-

¹ Oxadiazon — Ronstar, Rhone-Poulenc, Scotts Ornamental Herbicide I, O M Scott & Sons, Maryville, OH 43040

² Surflan — oryzalin, Elanco

³ Treflan — trifluralin, Elanco

grass is not a problem. If the field has a history of johnsongrass, the field is sprayed with Treflan EC 2 qt/A.

After the plants have been settled in with ½ to 1 inch of rain or irrigation, we band simazine (4) 80W 1 lb/A (0.8 lb AI/A) over the top in an 18-inch band. Simazine is used on all narrow-leaved evergreen liners, most shade tree and shrub liners. Shrubs as a group are more sensitive to simazine than evergreens or deciduous trees. We do not apply simazine on linden, althea, or euonymus spp. Surflan 2 lb AI/A is banded on these species.

During the first year of growth of a new liner it is most important to maintain as near a weed-free environment as possible. This includes control of perennial weeds as well as annuals. The herbicides we use for annual weed control do not do a good job of controlling perennial weeds, so special attention must be given to those perennials. Two of the perennials we contend with in Oklahoma are bermuda grass and johnsongrass. During the summer preceeding planting, if the vacant block has a perennial weed infestation, we spray with Roundup⁵ 3 qt/A for johnsongrass or 5 qt/A for bermuda grass.

During the summer after planting and successive summers as long as a weed problem remains, we walk the blocks, spot spraying with Roundup herbicide using Solo-brand backpack sprayers. We modify all our Solo sprayers to make them more comfortable for the person spraying by attaching Kelty backpack shoulder straps and hip belts. If we are attacking a bermudagrass problem, we mix Roundup 2⅔ oz/gal of water. For johnsongrass, we mix Roundup 1⅓ oz/gal. We must exercise great care to avoid getting spray drift on desirable plants.

CONCLUSION

Weed control in liners and field transplants is important to give the young plants a vigorous start. The methods just outlined have worked for us under our growing conditions. Other soils and growing conditions may be different from ours; so if you feel any of the ideas presented have merit in your liner production, they should be used with caution until tested in your own nursery.

QUESTIONS FOR LLOYD MODEN

JAKE TINGA: Why do you not also cover your aisles with plastic and treat with MeBr to avoid the continuing cost of control throughout the summer?

⁴ Simzaine — Princep, Ciba-Geigy.

⁵ Roundup — glyphosate, Monsanto

LLOYD MODEN: We do cover the aisles in the plastic houses, but it would double our cost to do so in the field.

BRUCE BRIGGS: Have you tried Goal (6)? Reported results look good for broad-leaved weed control.

LLOYD MODEN: We have not used it.

PHIL BEAUMONT: Why do you use such a high rate of Roundup? We have found we can add liquid dishwashing detergent and cut the rate one-half to one third.

LLOYD MODEN. $2\frac{2}{3}$ oz/gal is the recommended rate. We feel the cost of additional chemical, which gives us better control, outweighs the cost of more labor to hand weed or repeat applications.

HUGH STRAIN: Do you use a spreader?

LLOYD MODEN. No. It is not suggested on the label.

EARL ROBINSON: Does MeBr help with disease control?

LLOYD MODEN: We have fumigated for so many years that we have few disease problems.

GERALD SMITH: Where do you buy the Kelty shoulder straps and hip belts?

LLOYD MODEN. We buy these at the outdoor backpack sports supply houses.

A VERTICAL AIR-ROOT-PRUNING CONTAINER¹

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Abstract. A container was designed to prevent root circling and stimulate root branching. A test with the air-root-pruning container using *Pyra-cantha* × 'Mojave' showed an increase in top and root weight, number of branches per plant and number of 2 in long roots 10 days after transplanting of 63, 38, 158, and 187%, respectively, compared to plants grown in conventional containers. This container nests for shipping, can be filled by existing potting machines and can be handled and stacked for plant shipping like conventional containers.

INTRODUCTION

Plants have long been grown in pots in greenhouses and homes. However, the practice of producing large numbers of

⁶ Goal — oxyfluorfen, Rohm and Haas

¹ Patent applied for