

WEED CONTROL IN PINE NURSERIES

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Because of economic considerations and management practices, the weed problem is more perplexing in nurseries than in most other crops.

Economically, nurseries would be classified by most chemical companies as a "minor" crop. Thus, major emphasis is not placed on labeling herbicides for use in nurseries. In fact, there are probably fewer registrations of herbicides for minor crops today than there were 5 years ago. The situation in minor crops will be even more critical when the Federal Environmental Pesticide Control Act of 1972 becomes fully effective. The new law requires a federal registration for all herbicide uses, including state labels, by October 21, 1974. Furthermore, the new law provides civil and criminal penalties for uses inconsistent with specifications on the label. Thus, the user can then be prosecuted for any non-label use of a herbicide. To my knowledge, not even trifluralin (treflan) is registered for use in pine nurseries. Perhaps the enforcement of the new legislation will be such that a clearance for use in nurseries will be sufficient to cover all nursery crops. But the manner in which the law will be interpreted is not clear.

Management practices also add to the weed problem in nurseries. For example, most nursery seedlings grow best when the beds are kept warm and moist. However, these conditions are also ideal for weed growth and herbicide decomposition. Thus, herbicides which generally provide 3 to 6 months of effective control in field crops may only provide 6 weeks of effective control in the nursery. Furthermore, many nursery seedlings grow extremely slowly and thus are unable to compete with weeds effectively. The slow growth necessitates extended chemical weed control.

Also, good judgment must be exercised in selecting the mulching material and the water source; or they can continuously add weed seeds to the nursery. If irrigation water must be taken from a weedy reservoir, make certain that intake screens will filter the weed seeds. When the mulching straw is gathered from a weedy area, weeds are certain to appear in the seed bed. The old adage that an ounce of prevention is worth a pound of cure is particularly applicable to a nursery weed control program.

HERBICIDES FOR GENERAL WEED CONTROL

In my opinion, the incorporation of a dinitroaniline herbicide such as trifluralin (treflan) or nitralin (planavin) should be the heart of the herbicide program in a pine nursery. There are new chemicals such as dinitramine (cobex), profluralin (tolban), and butralin (A-820) which are also dinitroaniline herbicides and which provide excellent control of annual grasses and certain broadleaved species. If possible, the herbicide should be applied and incorporated with a power tiller as quickly as the old crop of seedlings is harvested. A second application of herbicide should be made a few days prior to seeding. This will insure that the

new crop can be seeded on a weed-free bed. The period of weed control obtained from the incorporated herbicide may be extended by the application of a pre-emergence herbicide such as fluorodifen (preforan) some 6 weeks after the pine seedlings have emerged, but before the dinitroaniline herbicide has degraded sufficiently to allow the weeds to emerge. This approach has looked promising in research plots but failed to reduce hoe-time the first year it was tried under standard production procedures. Mineral spirits or Stoddard solvent has been used to control the escape weeds; but unfortunately, many of the broadleaved weeds which escape the dinitroaniline herbicide are also resistant to mineral spirits.

HERBICIDES FOR NUTSEGE CONTROL

In a recent weed survey, purple nutsedge was voted the world's number one weed problem; and there are few herbicides which give effective control of this species. EPTC (eptam), incorporated a couple of weeks prior to seeding, delays the emergence of the nutsedge but does not give complete control and slightly stunts the pine seedlings. DSMA, used as a spot-spray, burns back the nutsedge; but regrowth will occur. Treatment with herbicides such bromacil (Hyvar-X) or terbacil (Sinbar) provide excellent control of the nutsedge, but pine seedlings cannot be grown for a year or more in the treated soil. Presently, the best solution for nutsedge is a soil fumigation with methylbromide or other fumigant. Fumigation has certain disadvantages including high cost and danger to the applicator. The shortage of plastic and other petroleum-based products necessary for containment of the fumigants had added to the urgency to find a replacement for the fumigants. Sodium azide has shown some promise as an alternative to the fumigants. The azide is applied as granules and then disked or watered into the soil. Although the azide is easily applied, the nutsedge control in our tests has been somewhat erratic, and a waiting time of a couple weeks is required before desirable plants can be seeded into the treated area.

WEED CONTROL ALONG FENCE ROWS AND IRRIGATION LINES

Where non-selective weed control is desired, paraquat and cacodylic acid (Phytar) are effective chemicals. Neither chemical has activity through the soil and a reinfestation of the weeds may be expected from seed or from vegetative parts of perennial weeds. Glyphosate (Round-up) is a new herbicide which also has little selectivity or activity through the soil. It is readily translocated within the weeds and thus is especially effective against perennial weeds such as Johnson grass. Round-up presently is labeled for non-crop use, but the supply is limited.

SPRAY EQUIPMENT

No herbicide that is improperly applied can be expected to provide satisfactory weed control. The philosophy that a little is good, a lot is better has no place in a weed control program. Careful calibration of spray equipment is essential. The type of equipment will, of course, vary with size and type of the spraying operation. Hand equipment works well

for spot treatments or for treatment of fence rows, etc. I prefer a bicycle sprayer for small plot work of a quarter-acre or less because of the maneuverability and ease of calibration of the equipment. Tractor-mount equipment is most efficient for most field work.

SUMMARY

Nurseries are one of the few remaining areas in which hand-weeding is still practiced. Chemicals have reduced the amount of labor required but have not provided a complete replacement for the weeding. Progress in chemical control has been slow because of management practices associated with the production of seedlings and by the growth habits of many of the species. The "minor" status of the nursery crops has also led to a minimum expenditures by private companies and governmental agencies for research in this area.