

# **WEED CONTROL IN THE FIELD: PRACTICAL SUGGESTIONS**

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Weed control in field-grown production requires more extensive management than in container-grown nursery stock. Field-grown nursery stock requires several years to reach salable size, and during the first one to three years, ornamental plants provide little competition with the weed species. This paper outlines several practical approaches to improving weed control in the field.

Three guidelines are useful when planning a weed control program. *First*, no one herbicide will control all weeds. *Second*, in the southeastern United States, most herbicide applications will remain effective for only 10 to 14 weeks. Finally, proper timing of the pre-emergence herbicide to a weed-free area is essential for good weed control. For example, in Alabama, preemergence herbicides should be applied in middle to late February, just prior to weed seed germination, and a second application should be made early to middle July. Most field producers now combine a herbicide providing control for annual grasses with a herbicide providing good broadleaf control. In Alabama the most popular preemergence herbicide combination is Surflan plus Princep.

There are a few herbicides that are widely used for pre-emergence weed control in field-production nurseries in the Southeast. Those selective preemergence herbicides utilized may be divided into two basic groups: annual grass herbicides and broadleaf herbicides. Among the herbicides used for annual grass control are Surflan, Pennant, and Lasso. Broadleaf herbicides include Princep and Goal. Broadleaf herbicides may result in injury to ornamental plants. Growers should consult the label before applying these or any herbicides. Plants injured by Princep in our research include Japanese holly and boxwood. Several other species are reported to be sensitive to Princep. Goal has some limited postemergence activity on weeds less than 2 to 4 in. tall and will injure ornamentals that have succulent growth. The Goal label states that it should be applied to dormant plants.

Several new herbicides are expected to be on the market during 1989. Gallery is a broadleaf herbicide that was expected to receive a label for turf in the fall of 1989 in a 75 DF formulation. In our test, Gallery has been safely applied over the top of four ornamental species twice a year for two years at 2 lbs. a.i./A with no injury. While weed control with Gallery appears no better than existing broadleaf herbicides in controlling weeds, it may be safer than either Princep or Goal to ornamental plants. Snapshot 80 DF will

possibly enter the ornamental marketplace during middle to late 1990. It is a combination product that contains 60 percent Surflan and 20 percent Gallery. In our tests, Snapshot 80 DF has provided weed control similar to that obtained with the current standard of Surflan plus Princep.

Several problems are common to many nurseries in attempting to obtain adequate weed control in the field. One of the most common problems encountered is poor calibration of the spray equipment. It is essential that growers know the amount of water being applied per acre. Without this knowledge it is impossible to determine accurately how much herbicide is being applied. Another problem that occurs is applying the herbicide to a field that is not weed-free. If the weed seed have already germinated, preemergence-applied herbicides will have little or no activity. A third problem frequently encountered is applying herbicides to plants that are not on the label. Increasing concern over the environment and proper use of pesticides will necessitate closer regulation of spray programs in the future.

Yellow nutsedge infestations are frequently encountered among nurserymen. Yellow nutsedge is difficult to control and spreads easily from field to field as equipment is moved. Field cultivation and hand hoeing may contribute to the spread of yellow nutsedge. Currently there are few labeled herbicides available, and they provide only limited control of yellow nutsedge without injuring ornamental plants. In 1986 a test was initiated evaluating several new herbicides demonstrating activity against yellow nutsedge. Herbicides evaluated include Classic, Reflex, Scepter, Zoriol, and Dual (which is currently labeled for nursery crops as Pennant 7.8 E). The latter three herbicides all provided excellent control of yellow nutsedge during the end of the first year and into the second year. However, Scepter was injurious to most of the ornamentals tested.

After two years of testing, all plots were replanted with ornamentals and treated with the industry standard herbicide program of Surflan and Princep. The purpose was twofold in that we were interested in residual control of yellow nutsedge and also wanted to determine if Scepter's residual activity would be injurious to the newly planted ornamentals. Residual activity from Zoriol (3 lb. a.i./A), Scepter (1 lb. a.i./A), and Dual (4 lb. a.i./A) continued to provide excellent control for a full year after the last application. Scepter was injurious to the replanted ornamentals with severe stunting occurring on boxwood and juniper. Nurserymen should use caution in experimenting with Scepter herbicide due to long-term soil activity. Zoriol is not currently labeled for ornamental use; however, it does appear to have promise in that it provided excellent control and caused no injury to the four species under evaluation. Dual (Pennant 7.8E) is labeled for field-grown nursery crops

and provided excellent preemergence control of yellow nutsedge. In our test 4 lb. a.i./A applied in early March followed by a repeat application in mid-July at the same rate resulted in excellent control of yellow nutsedge.

Not all weeds are controlled by preemergence herbicide applications. Such weeds may be controlled by postemergence herbicides. These may be classified by several different methods but for the purpose of this paper will be classified according to their effect on ornamental plants. Roundup and Gramoxone are both injurious to ornamental plants and should be applied in a directed method so that the spray material does not contact the ornamental foliage. Roundup is translocated throughout the target weed while Gramoxone is a contact herbicide that kills only that portion of the weed covered by the spray. Perennial weeds are typically not controlled by Gramoxone.

A frequent problem encountered with nursery producers is the inappropriate use of Roundup rates. For the control of annual weeds less than 6 in. in height, Roundup should be sprayed at the rate of 1 percent of solution or 1 quart per 25 gal. of water. If the annual weeds are larger than 6 in. in height, the rate should be adjusted upward to about 1½ qts of Roundup per 25 gal. of water. For perennial weeds, the rate should be increased to 3 to 5 qts per 25 gal. of water and sprayed while the weeds are in the mature stage. Applying a 1 percent solution of Roundup to perennial weeds is generally ineffective.

A second group of postemergence-applied herbicides includes Poast and Fusilade 2000. These two herbicides are generally non-injurious to ornamental plants. They are effective in the control of annual and perennial grasses and have no activity on broadleaf plants. For the control of annual grasses apply Poast at the rate of 21 oz./A and Fusilade 2000 at the rate of 16 to 24 oz./A. One application will generally remove annual grasses. For perennial weeds such as bermudagrass and johnsongrass two applications are necessary and should be applied at 10- to 14-day intervals. For perennial grass control, Poast should be applied 42 oz./A, Fusilade 2000 at 48 oz./A. The addition of a crop oil concentrate at the rate of 1 percent by volume is necessary for optimum activity of Poast. A non-ionic surfactant is needed for Fusilade 2000 and should be applied at half the rate of the crop oil concentrate (0.25 to 0.50 % by volume). Fusilade and Poast are more effective when applied to rapidly growing annual grasses. Grass under moisture stress will result in poor or inconsistent control. Relatively lower spray volumes of water have been more effective than high spray volumes. In our research, a volume of 20 gal/A is used. For tall or dense grass, the spray pressure should be increased (also resulting in increased volume and rate/acre if all other factors are held constant). In these situations, a spray pressure of 40 to 50 psi is generally adequate.

Fusilade 2000 and Poast are rapidly absorbed by the weed's foliage and, under ideal conditions of high temperature and high humidity, almost complete uptake may occur within one to two hours. This is in contrast to Roundup where rainfall within six hours of application may reduce its activity.

Finally, we will consider the new Federal regulations, specifically the "OSHA Hazardous Communications Standards." With these new regulations the grower must survey all chemicals used on the nursery and obtain material safety data sheets (MSDS) for each chemical. The MSDS should be placed in a location that is easily accessible for all employees. Whenever a new chemical is added to the nursery's pesticide program, an MSDS must be obtained for that chemical. Growers should have a training program for employees that are exposed to hazardous chemicals. In the training program items such as safety equipment to be worn, pesticide storage, what to do in emergency situations, and correct procedures for waste disposal should be covered. Failure to comply with these new guidelines may result in fines up to \$10,000 per violation and the possibility of civil suits.