

HERBICIDE UPDATE FOR CONTAINER WEED CONTROL

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Weeds are a persistent problem in container nursery production. Hand-weeding is time-consuming and expensive. Herbicides offer an alternative to hand-weeding.

HERBICIDES FOR USE IN ENCLOSED STRUCTURES

There are few herbicides that can be used in greenhouses. Temperatures in greenhouses can increase to high levels on sunny days, often causing volatilization of herbicides. Since greenhouses are enclosed structures, herbicide vapors can be trapped around plant foliage and cause damage. For this reason, there are no herbicides registered for use in containers for plants propagated in enclosed structures. There are three herbicides that can be applied under greenhouses benches for weed control. They are: diquat (Ortho Diquat), oryzalin (Surflan) and glyphosate (Roundup). There are special restrictions that apply to use of these chemicals in greenhouses.

HERBICIDES FOR USE IN OUTDOOR CONTAINERS

There are a number of herbicides available for use in containers maintained outdoors. Weed control relies on repeated application of preemergence herbicides since there are few selective postemergence herbicides available for nursery production. Most preemergence herbicides can only be applied to well-rooted cuttings or seedlings, thus limiting use primarily to production rather than propagation. Most preemergence herbicides should not be applied to unrooted cuttings or to seeded pots until the plants develop a root system. Certain preemergence herbicides, such as the dinitroaniline class [ex. oryzalin (Surflan)], inhibit new root development and thus could injure germinating seed or unrooted cuttings. These chemicals are safe once a plant has an established root system. Certain other herbicides, however, can be used during propagation. Oxyfluorfen (Goal), for example, can be applied at planting of conifer seed. The preemergence herbicides available to nurserymen can be divided into granular and sprayable formulations.

Granular Herbicides. For certain herbicides, granular formulations provide greater crop safety than sprayable formulations. Compounds in this group include oxadiazon (Ronstar) and the granular combination products that contain oxyfluorfen (Ornamental Herbicide 2, Rout). If the wettable powder formulation of

oxadiazon or the sprayable formulation of oxyfluorfen (Goal) is applied to sensitive species such as azalea, foliar injury could result. Formulating these compounds as granules reduces the potential for foliar injury. For other preemergence herbicides, such as metolachlor (Pennant) and napropamide (Devrinol), granular and sprayable formulations are equally safe to many nursery crops.

The granular products, Rout (oxyfluorfen plus oryzalin) and Ornamental Herbicide 2 (oxyfluorfen plus pendimethalin), provide broad spectrum annual weed control. These two products provide good to excellent control of the predominant container weed problems in Virginia: large crabgrass, *Oxalis*, common chickweed, prostrate spurge, and common groundsel. Oxadiazon (Ronstar) provides good control of many annual weeds but does not control common chickweed. The granular formulations of these herbicides are safe on a wide range of nursery stock. None of these three products will control perennial weeds such as yellow nutsedge, which occasionally is a problem in container production due to contamination of the pine bark commonly used as a media component.

Members of the dinitroaniline class of herbicides, which include trifluralin (Treflan), pendimethalin (Southern Weedgrass Control), and a combination of oryzalin plus benefin (XL), control annual grasses very effectively, but generally provide lower control of certain annual broadleaf weeds than oxadiazon or oxyfluorfen. For example, members of the dinitroaniline group control prostrate spurge but provide poor control of common groundsel. The dinitroaniline herbicides will not control perennial weeds.

Napropamide (Devrinol) is sold in both granular and sprayable formulations. Napropamide provides excellent annual grass control but lower control of prostrate spurge and common groundsel. It will suppress but not control yellow nutsedge. Metolachlor (Pennant), also available in granular and sprayable formulations, controls annual grasses but is ineffective on most annual broadleaf weeds. A major advantage of metolachlor is control of yellow nutsedge, a weed that is not controlled by most other preemergence compounds.

Sprayable Formulations. Oxyfluorfen (Goal) can only be applied to conifers due to the risk of foliar damage to other nursery species. Oxyfluorfen provides preemergence and early postemergence control of most annual broadleaf weeds found in container production. Oryzalin (Surflan) is very similar structurally to trifluralin and pendimethalin, and thus provides a similar spectrum of weed control. Oryzalin, like metolachlor and napropamide, are safe on a wide range of nursery stock.

Experimental Preemergence Herbicides. There are several experimental herbicides that could shortly receive registration for nursery use. Prodiamine is similar in weed control and crop safety

to oryzalin and trifluralin, although it may provide longer soil residual control. Isoxaben (Gallery) is a preemergence herbicide for annual broadleaf weed control. Combinations of isoxaben with trifluralin (Snapshot 2.5G) or oryzalin (Snapshot 80DF) has provided good control of annual grasses and broadleaf weeds. Prodiamine and isoxaben appear to be safe on a wide range of nursery stock, but will probably not be registered for use in enclosed structures or during propagation.

Postemergence Herbicides. There are few postemergence herbicides registered for nursery use. The nonselective herbicides paraquat (Gramoxone Super) and glyphosate (Roundup) could be used to control weeds growing in land near container-production areas, but will cause damage if ornamental foliage is contacted. Paraquat, a contact herbicide, controls annual weeds but only temporarily suppresses perennial weeds. Glyphosate, a systemic compound in plants, controls both annuals and perennials.

Sethoxydim (Poast) and fluazifop (Fusilade) are selective herbicides for the control of grasses in many nursery crops. These two chemicals only affect members of the grass family and will not control yellow nutsedge, wild onion, or any broadleaf weeds. Presently there are no selective herbicides for controlling emerged broadleaf weeds in nursery production.

Table 1. Effectiveness of preemergence herbicides for controlling the major weeds found in container production in Virginia.

Herbicide	Yellow nutsedge	Large crabgrass	Common groundsel	Prostrate spurge	Common chickweed
Ornamental Herbicide 2	N ¹	G	E	G	E
Rout	N	G	E	G	E
Ronstar	N	G	G	F	N
Surflan	N	E	P	G	E
Pennant	G	G	P	P	P
Devrinol	P	E	P	P	G
Southern Weedgrass Control	N	E	P	G	E

¹E = excellent ((90–100%) weed control, G = good (80–90%) weed control, F = fair (70–80%) weed control, P = poor (40–70%) weed control, and N = no control.