

A Promising Herbicide for Greenhouse Use

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In an attempt to control common bindweed (*Convolvulus* sp.) in greenhouses this past summer the literature on herbicides was searched. Most herbicides that are toxic to bindweed have properties that eliminate them from possible use in the greenhouse. Either they are volatile and injure the crop plants growing in the confined atmosphere or toxic residues persist in the soil and affect subsequent crops.

Of the several herbicides tested during the summer of 1973, Roundup® from Monsanto Chemical Company offered the most promise for greenhouse use. Roundup is N-(phosphonomethyl) glycine, with the common chemical name of glyphosate. This chemical was reported toxic to bindweed and grasses at 3 lbs. in 25 to 50 gallons of water per acre. It was further reported to leave no residue in the soil and effective on growing plants but not on seeds.

A series of tests of its effectiveness on bindweed were tried first in the field and later in the Bay Farm Research Greenhouse. To convert the above dosage to one usable for spot spraying around greenhouses a series of dilutions were tried. Dilutions of 1-100 or stronger were effective in every test. A dilution of 1-130 severely damaged bindweed by causing chlorosis and extreme branching but failed to kill it.

In each case the wetting agent Multifilm X 77 was added at 1-3000 and the bindweed foliage sprayed to runoff. Bindweed died in about 3 weeks following spraying under summer and fall conditions. None of the plants have resprouted from the roots.

After the toxic dilution was determined, larger tests on a wide range of greenhouse weeds were made. Dilutions of 1-75 and 1-100 were equally effective on bindweed, purslane, Canada thistle, brome grass and other perennial and annual grasses, chickweed, dock and several other miscellaneous weeds growing under

benches and in the outside walks of greenhouses. No weeds were found to survive this chemical.

Since the purpose of this search was to find a safe herbicide for killing bindweed in greenhouse rose plantings, Roundup at 1-100 was sprayed on the lower canes of test rose plants. None of the spray was allowed to drift to the foliage. New growths at the time of application became chlorotic, the foliage and developing flower buds were distorted and growth of these shoots was much reduced. This injury persisted to some extent into the second crop of flowers produced after spraying (about three months).

Monsanto does not have a label for the use of Roundup in greenhouses. An Industrial label is expected possibly by March, 1973. The company expects an Agricultural label in 1975 and a label permitting experimental use of Roundup in agriculture sometime in 1973. A label for full use of Roundup in ornamental plantings may not be forthcoming until after 1975.

Glyphosate is practically non-toxic by skin contact and has an LD₅₀ to rats of 4320 mg/kg when ingested orally. Its mode of action is by active translocation from the sprayed tops to roots and rhizomes. There has been no residual toxicity observed in soil so planting can be done immediately after spray application. Monsanto's 1973 Technical Bulletin on Roundup® reports an extremely wide spectrum of weeds controlled by post emergence spraying with this chemical.

Under no circumstances should this chemical be applied to crop plants or the spray allowed to drift on them. We will be continuing to expand our knowledge and experience with this promising herbicide.

Your Editor,



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