

# CONTROLLING WEEDS IN THE SOIL

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A weed is a plant growing where it is not wanted. Weeds can be native plants, introduced plants, or re-growths from previous crops. For successful control of weeds, it is necessary to understand how weeds became a problem. That is, the grower should know by what weeds he is bothered, how they get in the soil and what eradication method will best solve his problem.

The soil is full of weeds. These weeds come from seeds or parts of stems or roots that are capable of growth. Control measures good against germinating mustard seeds may not be effective against perennial weeds such as quack grass and bindweed. How do the weeds get in the soil? The main source of weed seeds and propagating vegetative parts is from the plants growing in the area. A soil covered with weed growth is very likely to be full of weed seeds. Quack grass and nut grass thrive on areas partially under cultivation. Birds spread weeds in their droppings. Spotty appearances of weeds such as dodder is usually blamed on birds. Animals can spread weed seeds in their droppings or from their fur. Man's efficient transportation and continuous shipping of material does most of the spreading of weed seeds. The weed seeds are carried in crop seeds, straw, hay, animal manure, packing materials, and with roots of crop plants moved from one area to another. This can be a particularly bad problem with perennial weeds such as chrysanthemum weed and quack grass in the soil of balled and burlaped nursery stock.

Weeds cost us money. The total crop loss in the United States due to weeds probably exceeds that due to insects and diseases combined. Estimates for the removal of weeds in florists' crops vary considerably but come in the range of \$300-\$800 per acre per season in closely planted beds as is the usual practice with azaleas, hydrangeas, chrysanthemums, and other florists' outdoor crops. In most of these plantings it is difficult or impossible to use mechanical means for weed control.

For efficient weed control the grower should know what weeds are causing him the most trouble. Except for most preplanting soil treatments, it is necessary to know what weeds need controlling. As mentioned previously control measures against annual and perennial weeds differ greatly. Also by killing some weeds with a chemical, another weed may become more of a problem. Using 2,4-D to control broadleaved weeds can cause a more serious nut grass problem. Using Karmex W in grape vineyards where there is some bindweed can create a serious bindweed problem as the unaffected bindweed takes over the area left by the destroyed weeds. After all, selective herbicides can favor certain weeds as well as certain closely related crop plants.

How much control does a grower want? Chrysanthemums given a good weed free start soon cover the bed making weed growth very difficult, but azaleas can

be badly crowded by weeds at any stage of growth. Weed control in delphiniums and peonies is a continuous problem over a period of years.

What is the effect of the treatment on the crop? Using 2, 4-D as a herbicide is safe on gladiolus and effective, but the drift may be disastrous to other crops. Chloro IPC has been injurious to Phlox and Iberis. In some cases where sprays of Chloro IPC have been harmful to the crop, applications of granular Chloro IPC have been as effective in controlling the weeds but caused no crop injury. Fumes of dinitro can be harmful to actively growing plants. However, it does a good weed control job as a directed spray under dormant plants or on the soil before seedlings or shoots from bulbs emerge.

The treatment of the soil for controlling weeds falls into three general periods: Preseason soil treatment, preplanting treatment, and post-planting treatment. Preseason treatments include mowing before seeding cover cropping to smother annual weeds and harrowing to kill quack grass. Preseason chemical treatments are recommended for real bad weeds.

Quack grass	Dowpon, TCA, Maleic hydrazide, Amino triazole
Wild Garlic	2, 4-D, esters
Horse nettle	2, 4, 5-T
Nutgrass	TCA or Amino triazole
Chrysanthemum weed	Amino triazole
Poison ivy	Amino triazole, Ammate or 2, 4, 5-T

It is desirable to follow manufacturer recommendations as to rates and time of application.

For preplanting soil treatments, the methods are

about the same as for good disease, nematode, and insect control. The grower should do all the jobs at once for effective pest control. The methods in order of preference are as follows:

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| 1. Steam          | 4. Vapam       |
| 2. Methyl bromide | 5. Mylone      |
| 3. Chloropicrin   | 6. Ayl alcohol |

These treatments are the best for weed control in areas of intensive cultivation and high crop value. The weed control alone pays for the treatment, with control of other pests as a bonus. Usual cost is about \$300-\$350 per acre. The details of these methods have been discussed by an earlier speaker. After treatment do not stir up the soil enough to bring to the surface untreated soil full of weed seeds.

Where preplanting soil treatments are impossible, undesirable or not economically profitable, it is necessary to use other methods for weed control. Under favorable conditions cultivation or mulching with a minimum of hand weeding may not be too expensive or harmful to the crop and give sufficient weed control. With plants in widely spaced rows, tractor cultivation can eliminate the weeds between the rows. However, hand weeding is usually necessary to remove weeds in the row.

Chemicals have been successfully used to control weeds in many crops including a few of interest to florists. All treatments should be tried on a limited scale for a season or two, especially if trying a chemical on a new crop. There is considerable information on chemical weed control in gladiolus. Sprays put on the soil after planting but before the crop comes up (preemergence) are very effective, giving residual weed control for about 1 month. Post emergence treatments are put on growing plants to control later weed growth. The following table lists effective materials and time of treatment.

Chemicals for Weed Control on Gladiolus

Stage of Development		Chemical	Rate	
Gladiolus	Weeds		Per acre	Per 400 sq. ft.
Preemergence	Less than 1/2 inch	1. Chloro IPC	6-8 qts/40-100 gal*	1-2 1/2 fl. oz/gal*
Preemergence	Less than 1/2 inch	2. Chloro IPC 5% granular	120-160 lbs	1-1 1/2 lbs
Preemergence	Less than 1/2 inch	3. Crag #1 (Sesone)	4-6 lbs/40-100 gal	10-14 tsp/gal
Preemergence	Less than 1/2 inch	4. Karmex DW (Diuron)	3/4-1 1/2 lbs/40-100 gal	2-4 tsp/gal
Preemergence	Less than 1/2 inch	5. 2, 4-D	1-3 lbs actual/40-100 gal	Variable
Preemergence	Any stage	6. Dinitro (Premerge Sinox PE)	4 qts/40-100 gal	1 fl. oz/gal
Postemergence	Less than 1/2 inch	7. Chloro IPC 5% granular	120-160 lbs	1-1 1/2 lbs
Postemergence	Less than 1/2 inch	8. Crag #1	4-6 lbs/40-100 gal	10-14 tsp/gal
Post flowering	Small	9. Karmex W (Monuron)**	1 lb/40-100 gal	3 tsp/gal

\* Water

\*\* Number 9 should be used as directed, spray at base of plants

Chemical treatments on other florist crops have not been tested adequately to be fully recommended. However, some treatments have shown sufficient promise to be worthy of trial by growers of outdoor cut flowers and plants. To be effective, the herbicides should be applied soon after transplants become established and before weeds have grown over 1/2" in height or just after the area has been weeded. The soil must be moist for maximum benefit from the chemical. Herbicides used were Chloro IPC and Crag #1. Chloro IPC at 4-8 quarts of liquid/100 gallons of water/acre was effective in the spring and early summer but did not control Galinsoga in August and September. Chloro IPC is very effective against purslane, chickweed,

mustard, and annual blue grass. Crag #1 at 4 lbs/100 gallons of water per acre was quite effective during the warmer weather and was effective against Galinsoga in late summer.

The following crops tolerated both chemicals to a fairly high degree: carnation, Chrysanthemum, English ivy, Pachysandra, snapdragon, Petunia. Some tests have shown Azaleas to be injured by Crag #1 and Phlox and Iberis to be injured by Chloro IPC. Currently tests are being carried out on Delphinium and Peony. A more complete list of crop plants experimentally shown to be injured and not injured by Crag #1 and Chloro IPC will be prepared at a later date.