CHEMICAL WEED CONTROL IN CARNATION TRANSPLANTS

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Weeds are a problem in transplanted carnations during early stages of development when there can be no soil fumigation or steam sterilization. Early mechanical control of weeds is made impossible by the wire, plastic or bamboo netting that is placed on beds at planting for plant support. The only alternative is expensive hand weeding. The study reported here evaluates herbicides for control of weeds in transplanted carnations in ground beds.

IN THESE TESTS of herbicides for weed control in carnations, ground beds were prepared for planting by incorporating one inch of redwood shavings into 4 to 6 inches of a Sorrento fine sandy loam soil by rototilling. The herbicides pyrazon (Pyramin), propachlor (Ramrod), RH 315 (Kerb), and cycloate (Roneet) were sprayed on the surface with a 2 gallon X-Pert Hudson sprayer equipped with an 8002 Tee-jet nozzle, and were then incorporated into the soil about one-half inch deep with a garden rake.

A Gates irrigation system was installed and wire netting for later support of plants was put in place. Plants of Improved White Sim and Scania were set in place September 10 using a staggered spacing 6 by 8 inches apart, one week after treating the soil with herbicides. The treatments were replicated four times, with two replications for each of the two carnation varieties.

Weed counts by species, crop phytotoxicity ratings, and cut flower yields were taken at intervals after herbicide application (tables 1 and 2). Weed counts and crop phytotoxicity ratings were made October 2, November 10, and December 16. Yield counts were made March 2, April 13, and May 7 by tagging all buds on the plants. The yield reported in table 2 is the total harvest for the first crop season. Individual plots were 2 feet by 2 feet, and the staggered planting design resulted in a different number of crop plants in treatments—which was not necessarily related to herbicide use.

TABLE 1. TOTAL WEED COUNT BY SPECIES AFTER HERBICIDE TREATMENT, AND PER CENT WEED REDUCTION FROM CONTROL

Herbicide	Rate	ai/A	Weed Count*								Total species	Reduction from control
			a	b	c	d	e	f	g	h		
		lb	no.								no.	%
pyrazon		2	7	19	5	1	10	14	1	11	68	63.1
pyrazon		4	4	4	3	0	1	3	1	3	19	89.7
propachlor		6	4	6	1	0	0	9	0	8	28	84.8
propachlor		12	0	3	4	0	0	15	0	5	26	85.9
RH 315		0.5	2	6	0	0	1	7	1	19	36	80.5
RH 315		1.0	0	8	0	0	0	6	1	0	15	91.9
cycloate		0.5	3	8	1	0	0	8	2	6	28	84.8
cycloate		1.0	13	16	1	0	0	1	2	8	41	77.2
Control		—	68	38	23	14	10	10	8	13	184	—

* a. Lambs'-quarters (Chenopodium album), b. Dwarf Mallow (Malva rotundifolia), c. Purslane (Portulaca oleracea), d. Annual bluegrass (Poa annua), e. Mare's tail (Erigeron canadensis), f. Bermuda buttercup (Oxalis cernua), g. Prostrate pigweed (Amaranthus blitoides), h. miscellaneous species including common brass button (Cotula coronopifolia), Bur clover (Medicago hispida), Red-stem filaree (Erodium cicutarium), London rocket (Sisymbrium Irio), Common yellow mustard (Brassica campestris), Small Nettle (Urtica urens) and nightshade (Solanum Nigrum).

TABLE 2. CUT FLOWER YIELD AND CROP PHYTOTOXICITY RATING

Herbicide	Rate ai/A	White Sims/ treatment	Scania/ treatment	White Sims harvested/ treatment	Scania harvested/ treatment	Visual phytotoxicity
	lb	no.	no.	no.*	no.*	rating†
pyrazon	2	18	15	101	111	0
pryazon	4	12	12	69	55	3.0
propachlor	6	15	18	124	165	0
propachlor	12	15	18	124	165	0
RH 315	0.5	16	13	97	81	2.2
RH 315	1.0	0	3	0	13	4.8
cycloate	0.5	15	15	110	143	0
cycloate	1.0	18	18	164	151	0
Control	—	18	15	164	137	0

* Harvested March through July.
† Average of 4 replications made on December 16.

Each of the chemicals provided considerable initial reduction in weed population compared with the control area. Propachlor and RH 315 continued to reduce weed numbers until the crop plants completely covered the bed. Pyrazon and RH 315 damaged the crop. The first symptoms of RH 315 and pyrazon were lack of growth and chlorosis (some yellowing of leaves), followed by death of some plants particularly at the 1-lb rate.

Effective weed control of all annual broadleaf and annual grass species was achieved with the herbicides propachlor at rates of 6 and 12 lbs per acre, pyrazon at 4 lbs per acre, and RH 315 at rates of 0.5 and 1.0 lb per acre. Excessive injury was observed with RH 315 at 1.0 lb per acre and moderate injury even at the 0.5 lb per acre rate. Pyrazon and cycloate were weak on *Malva*, and cycloate also did not control *Chenopodium*. Bermuda buttercup, a perennial, produces bulbs—thus differing from the annual weed species growing in the plot area which reproduced from seed. None of the herbicides was effective against Bermuda buttercup. Preemergence herbicides are usually most effective against tender, germinating seedlings. This experiment tends to confirm that these herbicides are weak or ineffective against perennial weeds reproducing from underground storage organs.

The University of California does not have recommendations for herbicides in carnations. However, the herbicide propachlor (Ramrod) has a Federal registration for several field crops and an experimental label for turf.

From the results of this experiment, propachlor appears to be a promising preemergence, pre-plant, herbicide for control of a wide range of weed species. Propachlor when used as a preemergence herbicide has controlled late-emerging weeds. Good incorporation of propachlor into the soil was important for effective weed control.

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