

TOLERANCE OF ROOTED AND UPROOTED GROUND COVER PLANTINGS TO PREEMERGENCE HERBICIDES — Progress Report

Wesley A. Humphrey and Clyde L. Elmore*

Weed competition and control of weeds are two major factors in establishing ground-cover plantings. The earlier weed control can be accomplished after planting, the less competition there is in establishing the ground covers, and the better the appearance of the planting. Several preemergence herbicides are registered for use on some of the more commonly planted ground covers after the cuttings have been in place for various lengths of time. Additional information is needed on the effect of preemergence herbicide applications on newly planted ground covers, planted as either rooted or unrooted cuttings.

Most ornamental ground covers are planted into landscape plantings as rooted cuttings, except for some of the iceplants, particularly *Carpobrotus edule*, sometimes known as Hottentot fig. *Carpobrotus edule* has large fleshy leaves that dry out very slowly. Three- to four-node, unrooted cuttings planted into moist soil root easily.

A field study was begun to obtain some information on the tolerance of rooted and unrooted cuttings of some of the iceplants and trailing African daisy to preemergence herbicides applied the day after planting and to evaluate the resulting weed control. Plants used were *Carpobrotus edule*; *Delasperma alba*, white iceplant; *Hymenocyclus luteolus*, yellow trailing iceplant; and *Osteospermum fruiticosum*, trailing African daisy. Cuttings of these four ground covers were rooted in sand for 6 weeks, and on March 23, 1977, both rooted and unrooted cuttings were planted 2 feet apart in rows into a Hanford sandy loam soil. A light sprinkler irrigation was applied immediately after planting. The next day, the preemergence herbicides napropamide (Devrinol), nitrofen (Tok), oryzalin

(Surflan), and prodiamine (Rydex) were applied over the planted areas in 50 gallons of water per acre. After the herbicide application, a light sprinkler application was made to wash the herbicides from the ground cover foliage and to incorporate the herbicides into the soil. The plantings were maintained with regular irrigations to provide moisture for rooting and establishment of the ground covers.

Growth evaluations and weed control ratings were made on May 3, 1977, 41 days after planting (table 1). On July 26, 1977, the ground cover plants were harvested and fresh weights recorded (table 2).

Results

Visual ratings of the tolerance to the herbicides made on May 3 showed, in general, little adverse effect on any of the ground covers planted as rooted cuttings (table 1). Unrooted cuttings of the ground covers in treated areas appeared as good as plants in the control or untreated areas, with the exception of *Delasperma* at the 8-pound-per-acre rate of napropamide. Growth of those plants was reduced considerably.

Weed control results varied; prodiamine and oryzalin gave the higher overall control ratings (table 1). Napropamide and nitrofen gave a high level of control of some weed species evaluated but did not control other species, resulting in an overall weed control of 40 to 60 percent. Napropamide provided low control of pigweed in this study but controlled both sowthistle and London rocket. Nitrofen's control of sowthistle was weak, lowering its overall effectiveness in this study.

* Farm Advisor, Cooperative Extension, Orange County, and Weed Scientist, Cooperative Extension, Davis, respectively.

Fresh weights of the ground covers taken at the end of study indicate that reducing the weed competition with preemergence herbicides can result in excellent establishment of the rooted ground covers when compared with the unweeded control (table 2). Also, because no hand weeding was done in any plots, weed competition may also account for the reduced weights when comparing the various herbicide-treated plots.

Growth of treated, unrooted *Carpobrotus* was somewhat reduced when compared with that of treated, rooted cuttings, but the rate of growth was still higher than that of the untreated control. Unrooted *Delasperma* and *Hymenocyclus* both became established at a higher rate than the untreated controls in all

herbicide treatments; proflam and oryzalin yielded the highest weights. *Osteospermum* planted as unrooted cuttings were poorly established in this study; however, a high level of growth occurred in the oryzalin- and proflam-treated areas when compared with the untreated control.

In this study, the four ground covers planted as rooted cuttings showed a high level of tolerance to the preemergence herbicides used. With the exception of the unrooted *Osteospermum*, the ground covers planted as unrooted cuttings did not appear, in general, to be reduced in growth by the herbicides.

This study is continuing and additional information will be reported as it is obtained.

TABLE 1. TOLERANCE AND WEED CONTROL IN ROOTED OR UNROOTED ORNAMENTAL GROUND COVERS RATED MAY 3, 1977

Herbicide	Rate/ acre	Tolerance*								Weed control†				
		<i>Carpobrotus</i>		<i>Delasperma</i>		<i>Hymenocyclus</i>		<i>Osteospermum</i>		Rough pigweed	Prostrate pigweed	Sow- thistle	London rocket	All weeds
		Rooted	Unrooted	Rooted	Unrooted	Rooted	Unrooted	Rooted	Unrooted					
<i>lb</i>														
napropamide	4	0.5	3.2	1.8	3.0	1.5	3.5	0.0	5.8	5.2	2.2	9.8	10.0	4.2
napropamide	8	0.5	3.8	1.5	5.8	1.2	4.8	1.2	5.5	6.5	4.2	9.8	9.8	5.8
oryzalin	2	0.5	3.0	0.8	2.8	1.8	3.5	0.2	4.8	9.5	6.8	9.0	10.0	8.2
oryzalin	4	0.2	2.8	1.2	4.0	0.8	4.5	0.5	5.5	10.0	9.2	9.8	10.0	9.2
nitrofen	4	0.8	0.5	0.2	1.5	0.5	1.0	0.2	4.2	9.2	6.8	3.2	9.8	5.8
proflam	2	0.5	4.8	1.8	1.5	1.8	2.8	1.2	4.2	10.0	9.8	9.5	6.8	8.2
proflam	4	0.8	2.2	1.5	2.8	1.2	3.5	0.2	4.8	10.0	10.0	9.8	10.0	9.8
control	—	2.0	3.5	2.0	3.5	2.2	4.5	1.5	6.8	0.0	0.0	0.0	0.0	0.0

* Tolerance: 0 = no effect, 10 = dead plants.

† Weed control: 0 = no control, 10 = complete control.

TABLE 2. EFFECT OF FOUR PREEMERGENCE HERBICIDES ON THE FRESH WEIGHT OF FOLIAGE OF ROOTED AND UNROOTED GROUND COVER SPECIES*

Herbicide	Rate/ acre	<i>Carpobrotus</i>		<i>Delasperma</i>		<i>Hymenocyclus</i>		<i>Osteospermum</i>	
		Rooted	Unrooted	Rooted	Unrooted	Rooted	Unrooted	Rooted	Unrooted
		<i>lb</i>	<i>gm</i>	<i>gm</i>	<i>gm</i>	<i>gm</i>	<i>gm</i>	<i>gm</i>	<i>gm</i>
napropamide	4	37.9 c	17.7 c	6.2 cd	2.8 b	13.8 c	2.3 c	3.1 c	0.7 a
napropamide	8	40.4 c	28.0 bc	6.7 cd	3.4 b	8.7 c	7.1 c	3.4 c	0.1 a
oryzalin	2	64.4 b	43.7 ab	14.8 bc	6.6 b	32.0 b	14.1 bc	7.2 c	1.5 a
oryzalin	4	75.3 ab	56.4 a	27.2 a	9.0 ab	43.0 ab	9.2 bc	13.5 ab	0.8 a
nitrofen	4	29.4 cd	25.1 bc	7.9 cd	5.3 b	15.5 c	6.2 c	2.7 c	0.3 a
proflam	2	77.2 ab	51.8 a	21.2 ab	15.8 a	35.4 ab	28.0 a	7.4 bc	1.0 a
proflam	4	88.5 a	56.8 a	24.8 ab	16.4 a	48.8 a	21.1 ab	15.9 a	1.8 a
control	—	13.5 d	11.0 c	3.6 d	1.6 b	4.1 c	0.8 c	1.8 c	0.2 a

* All means followed by the same letter are not significantly different from each other at P = 0.05.