

GROUND COVER SPECIES tolerance to herbicide applications

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Linuron applications at 1 lb per acre severely injured only one of the nine ground cover species tested in this study (*C. edule*). Amino triazole at 1 lb per acre was applied to all species, except *Ajuga reptans* or *Delasperma alba*, without severe injury. Injury from MCPP was less severe than 2,4-D in most instances and would appear to be safer in these tests at herbicidal rates. However, injury was apparent from MCPP on *Ajuga reptans*, although 2,4-D amine did not appear to cause injury in this test. Bromoxynil appeared to have contact effects only (as indicated by early leaf burning) on *Carpoprotus edule*, *Delasperma alba*, *Hypericum calycinum*, and *Vinca minor*; however, regrowth was normal.

FEW HERBICIDES can be used safely as a postemergence treatment over a broad spectrum of ground cover species. Weeds that have escaped preemergence treatment or are not treated, usually must be removed mechanically or by hand.

Five chemicals

In this test of postemergent herbicides, five chemicals were applied as broadcast sprays over established rows of nine ground cover species at the San Jose Field Station. Treatments were applied July 26, 1971, using a Champion knapsack sprayer with three teejet 8004 nozzles at a pressure of approximately 30 psi. No surfactants were used with any treatment. Each treatment was replicated four times. Injury evaluations (tables 1 and 2) were made September 1, 1971, September 30, 1971, and October 22, 1971.

Vinca minor

At a rate of 1 lb per acre, bromoxynil initially injured *Vinca minor* severely, completely removing its leaves. Regrowth was unaffected, however. Amino triazole and 2,4-D amine caused their characteristic symptoms early with only amino triazole persisting more than a month. MCPP appeared to be much safer than 2,4-D amine on *V. minor*. Linuron did not injure *V. minor* at 1 or 2 lbs per acre.

Hypericum calycinum

Initial injury to *Hypericum calycinum* from amino triazole was shown by chlorotic symptoms which remained seven weeks after application. At 1 lb per acre, bromoxynil burned foliage, but recovery was complete.

Delasperma alba

Almost all of the herbicide treatments injured *Delasperma alba*. Amino triazole

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orchard conditions. Although this publication is particularly concerned with problems involving a lower-yield harvest, it should be valuable for improving harvest efficiency of any tree crop.

1972 CROP WEED CONTROL RECOMMENDATIONS. University of California recommendations for weed control in different crops. Includes application and safety suggestions.

severely yellowed the plants, with symptoms lasting over seven weeks. 2,4-D amine and MCPP injury appeared as twisting of new growth and tip dieback. Linuron caused leaves to turn red and stunted the *D. alba* at both 1 and 2 lbs per acre; however, 1 lb per acre appears to be safe enough.

Gazania splendens

Although there was only a marginal stand for evaluating *Gazania splendens*, it was apparent that linuron, MCPP, or bromoxynil did not excessively injure the plants. Amino triazole discolored foliage; however, at 1 lb per acre it did not kill the plants. 2,4-D amine at 0.5 lb per acre did not appear to injure *G. splendens*.

Hedera canariensis

Amino triazole turned *H. canariensis* leaves chlorotic. MCPP did not appear to give any injury at 1 or 2 lbs per acre, nor did 2,4-D amine at 0.5 lb per acre. Slight leaf burn was noted with bromoxynil at 1 lb per acre; however, the burn was only slight, and new growth was not affected. Linuron at 1 or 2 lbs per acre did not appear to injure *H. canariensis*.

INDEX AVAILABLE

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Hedera helix

Amino triazole at 1 lb per acre was the only treatment which appeared to affect *Hedera helix*. These symptoms were the normal amino triazole chlorosis. No injury was apparent from the other herbicides.

Carpobrotus edule

Several interesting effects were noted with herbicides on *Carpobrotus edule*. Linuron caused a severe red spotted condition on the foliage which was apparently due to spray droplets. Amino triazole gave only slight chlorosis at 1 lb per acre in this test. MCPP at 1 lb per acre appeared to give only slight distortion of growth; however the distortion at 2 lbs per acre was unacceptable. Injury

was also unacceptable with 2,4-D amine at 0.5 lb per acre for the first month after treatment. Regrowth, however, did occur and symptoms were reduced. Bromoxynil severely injured *C. edule* (table 2) as observed by foliage necrosis.

Sedum brevifolium

All five herbicides at all rates appeared to be acceptable on *Sedum brevifolium*. Bromoxynil at 1 lb per acre did kill the flower stalks which were present at time of treatment.

Ajuga reptans

The herbicide, bromoxynil, at 1 lb per acre did not injure *Ajuga reptans*. MCPP and amino triazole severely injured *A. reptans*, giving characteristic symptoms of distortion and chlorosis respectively. After seven weeks, however, only slight leaf discoloration and stunting were observed.

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TABLE 1. TOLERANCE OF 5 GROUND COVER SPECIES TO 5 HERBICIDES EVALUATED* AT THREE INTERVALS AFTER TREATMENT

Herbicide	Rate lb ai/A	Vinca minor			Hypericum calycinum			Delasperma alba			Gazania splendens			Hedera canariensis		
		9/1	9/30	10/22	9/1	9/22	10/22	9/1	9/30	10/22	9/1	9/30	10/22	9/1	9/30	10/22
linuron	1	1.2	0.2	1.0	0.2	0.5	0.5	1.8	0.5	2.2	0.8	0.3	1.0	0.8	0.2	1.0
linuron	2	1.8	0.5	1.0	0.0	0.0	0.0	2.2	0.2	2.2	1.0	0.3	0.3	1.2	0.5	0.5
amino triazole	1	3.0	3.0	2.0	3.0	3.7	2.7	5.8	6.8	6.5	4.0	3.0	1.5	3.2	3.5	3.0
MCPP	1	0.0	0.0	0.0	0.2	1.0	0.2	3.8	3.5	4.5	0.0	0.3	0.7	0.0	0.0	0.5
MCPP	2	0.2	0.0	0.0	0.5	0.8	1.0	3.2	3.8	5.5	2.0	0.7	0.0	0.0	0.0	0.0
2,4-D amine	0.5	3.8	1.2	0.0	2.8	2.8	0.0	5.5	2.0	3.2	1.0	0.3	0.0	0.5	0.5	0.0
bromoxynil	1	6.8	0.2	0.0	2.8	1.2	0.0	4.2	1.2	2.2	0.0	0.7	0.7	1.2	0.8	0.0
control	-	0.8	0.2	0.5	0.2	0.8	0.0	0.2	0.2	0.2	0.0	0.0	0.7	0.0	0.2	0.0

* phytotoxicity: 0 = no effect; 10 = dead plants

TABLE 2. TOLERANCE OF 4 GROUND COVER SPECIES TO 5 HERBICIDES EVALUATED* AT THREE INTERVALS AFTER TREATMENT

Herbicide	Rate lb ai/A	Ajuga reptans			Sedum brevifolium			Carpobrotus edule			Hedera helix		
		9/1	9/30	10/22	9/1	9/30	10/22	9/1	9/30	10/22	9/1	9/30	10/22
linuron	1	2.0	0.8	0.5	0.0	0.2	0.0	2.0	4.0	4.5	0.5	Not	0.2
linuron	2	2.2	2.0	0.2	0.5	0.2	0.2	3.5	5.0	6.5	0.8	evaluated	0.0
amino triazole	1	6.5	3.8	0.7	0.8	1.2	0.2	1.0	3.0	2.8	3.2		1.5
MCPP	1	4.0	6.8	1.0	0.2	0.5	0.5	0.5	1.2	0.8	0.2		0.0
MCPP	2	2.5	2.5	0.0	0.2	0.5	0.2	3.5	3.2	1.2	0.0		0.0
2,4-D amine	0.5	1.0	0.2	0.0	1.2	0.0	0.2	3.5	1.0	0.7	0.8		0.0
bromoxynil	1	0.5	0.2	0.0	0.8	0.0	0.0	4.5	1.8	1.0	1.0		0.0
control	0	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0		0.0

* phytotoxicity: 0 = no effect; 10 = dead plants