WEED CONTROL IN CONTAINER PLANT PRODUCTION

THOMAS A. FRETZ[1]

Department of Horticulture
University of Georgia
Georgia Station
Experiment, Georgia

Abstract. A series of experiments on weed problems associated with container plant production are discussed. In weed competition studies both *Amaranthus retroflexus* L (pigweed) and *Digitaria sanguinalis* (L) Scop. (crabgrass) at densities of 1, 2, 4, 8, 16 and 32 plants per 1 gallon nursery container significantly reduced the size of *Ilex crenata* Thunb 'Convexa' (Japanese holly) over the hand-weeded controls. Japanese holly plants were 30-75% reduced in size from the controls due to weed competition effects.

After 2 years of study the following herbicides, CIPC + PPG-124 at 8 lb ai / A, EPTC at 5 and 20 lb ai / A, CIPC at 8 lb ai / A, dichlobenil at 4 and 12 lb lb ai/A, and diphenamid at 20 lb ai / A when impregnated on milled pine bark mulch calculated to deliver the expressed rate when applied at a depth of ½ inch provided adequate control of both broadleaf and grass weed species for 150 days in container grown *Rhododendron obtusum* Planch var. *amoenum* Rehd 'Hino Crimson' (Hino Crimson azalea) and Japanese holly Severe injury was observed on both container grown species from the use of dichlobenil at the 12 lb ai / A rate. EPTC at the 20 lb ai / A rate caused excessive injury to only the Hino Crimson azalea

Studies conducted for 2 growing seasons showed that preemergent herbicide applications of the following materials, dichlobenil at 12 lb ai / A, trifluralin at 8 lb ai / A, EPTC at 5 and 20 lb ai / A, CIPC + PPG-124 at 8 lb ai / A and diphenamid at 20 lb ai / A provided adequate broadleaf and grass weed control 163 days after application when employed on container-grown *Rhododendron obtusum* Planch var. *amoenum* Rehd. 'Coral Bells' (Coral Bells azalea) and Japanese holly EPTC at 20 lb ai / A caused excessive injury to the Coral Bells azalea, while dichlobenil at 12 lb ai / A severely injured both species

The growth of the containerized nursery industry over the past few years has led to increased interest in controlling weeds that invade containers. Unfortunately, herbicide practices employed under field production schemes cannot be directly related to container plant production due to the limited soil volume and more frequent water and fertilization practices. Ideally, nurserymen start with a weed-free medium, but seeds are introduced into the medium via wind and water. Estimates of $500 per year per acre for manual removal of weeds from container-grown stock appears to be a realistic value. Accordingly, if weeds are not removed plant growth is seriously retarded.

---

[1]Technical assistance of Mr L. Freeman is gratefully acknowledged

During the past 2 years, several studies have been initiated at the Georgia Station to investigate the problem of weed control in container grown nursery stock. A synopsis of these studies will be presented in this paper.

WEED COMPETITION STUDIES

Review of Literature. It is axiomatic to say that weeds alter the normal growth patterns of crop plants when competing for water, nutrients and light. Previous studies have determined the effects of weed infestations on field crops; in corn, for example, Staniforth (6) has reported yield reductions in excess of 35% due to weed infestations.

A present, little is known of the losses in container-grown nursery stock due to weed competition. This particular study was initiated to investigate the effects of 2 weed species at various densities on the growth of *Ilex crenata* Thunb. 'Convexa' (Japanese holly) in 1 gal containers.

Materials and Methods. Cuttings of Japanese holly were planted in 1 gal nursery containers on May 1, 1971, in a medium of peat moss, pine bark and sand (1:2:1 v/ v/ v) amended with 4 lb/ cu yd of dolomitic limestone and 3 lb/ cu yd of superphosphate. Redroot pigweed (*Amaranthus retroflexus* L.) and large crabgrass (*Digitaria sanguinalis*(L.) Scop.) seed were sown in the containers and, after germination, were thinned to densities of 0, 1, 2, 4, 8, 16, and 32 plants per container. A randomized design with 8 single plant replications was employed during the study with data being collected on August 10, 1971, 100 days after initiation of the treatments.

Results. Both competing weed species, regardless of their densities, significantly decreased the dry weight of Japanese holly when the weeds were allowed to mature in the containers. No significant differences in the Japanese holly dry weight were observed as the number of competing redroot pigweed plants increased, indicating that even a single plant of this weed species was able to reduce plant production in a 1 gal container (Table 1 and Figure 1). When crabgrass was the competing weed species, an even larger reduction in size of the Japanese holly resulted, indicating that crabgrass was the stronger competitor of the 2 weed species studied (Table 1).

HERBICIDE IMPREGNATED MULCHES FOR WEED CONTROL IN CONTAINER NURSERY STOCK

Review of Literature. Herbicide impregnated mulches have been described by various researchers as a promising means for providing full season weed control in ornamental plantings (4, 5). Bing (2) employed 2,6-diclorobenzonitrile (dichlobenil) impregnated

Table 1. Competition effects from redroot pigweed and large crabgrass on 1 gal container-grown Japanese holly.

Weed density	Redroot pigweed competition		Large crabgrass competition	
	Dry weight		Dry weight	
Plants Per Container	Japanese holly	Pigweed	Japanese holly	Crabgrass
0	2.16 a[x]	0.00 a	2.33 a	0.00 a
1	1.40 b	12.56 b	1.09 b	26.99 b
2	1.53 b	14.44 c	0.85 bc	27.82 b
4	1.32 b	16.15 cd	0.93 bc	28.44 b
8	1.14 b	15.51 cd	0.99 b	27.81 b
16	1.20 b	16.31 d	0.58 c	30.34 bc
32	1.07 b	16.49 d	0.63 c	33.21 c

x/ Means in a column followed by the same letter are not significantly different at the 5% probability level as determined by Duncan's Multiple Range Test.

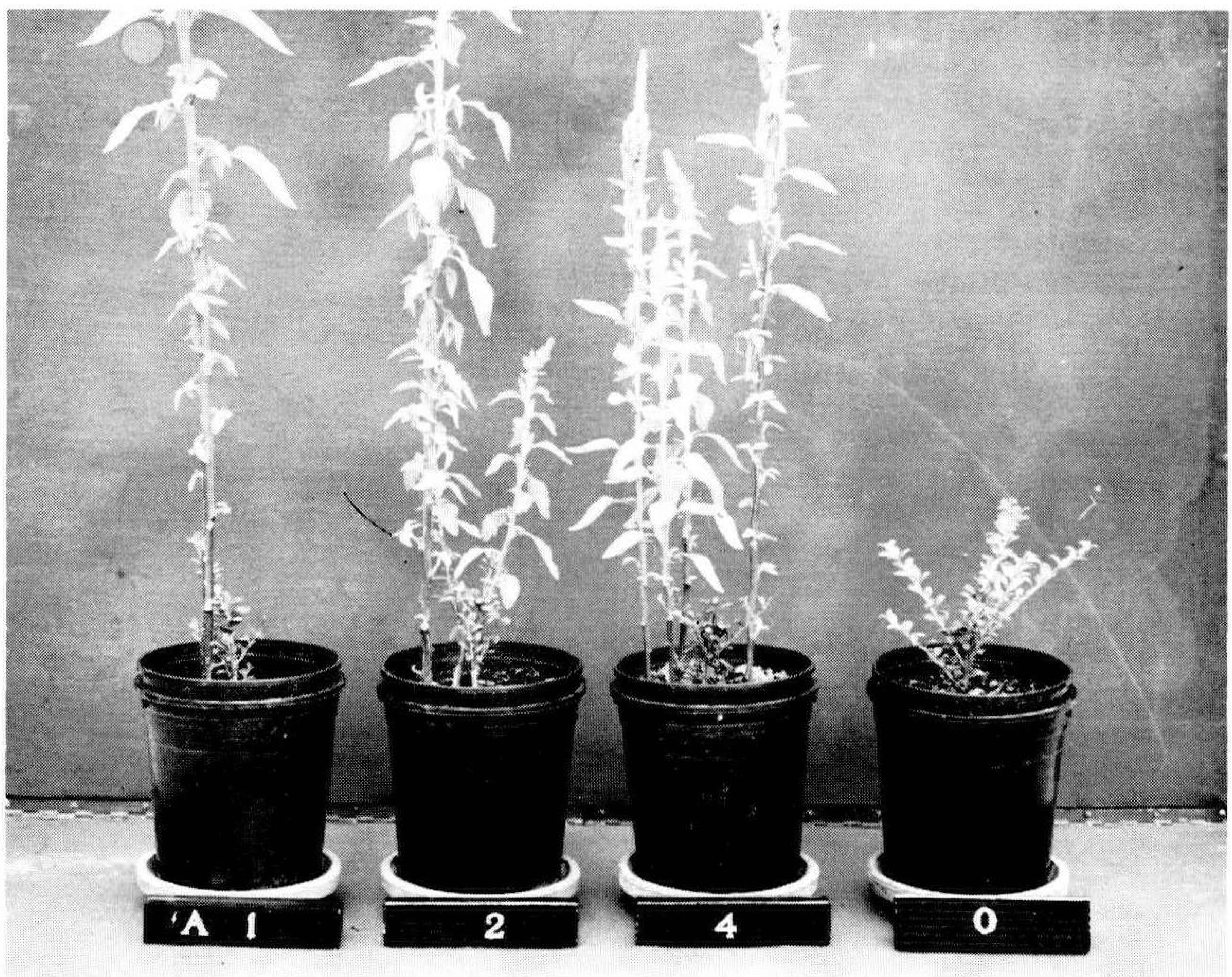

Fig. 1. Effect of various densities of redroot pigweed on the growth of Japanese holly in 1 gal containers. Left to right: 1, 2, 4, and 0 weeds per container.

mulches to achieve satisfactory weed control along highway plantings. His results indicated that ½ inch of the herbicide impregnated mulch performed as satisfactorily as 2 to 3 inches of non-treated mulch. Lanphear (5) has reported that dichlobenil impregnated mulch combinations were an excellent means for controlling weed growth in field grown nursery stock.

This study was initiated to investigate promising herbicide impregnated mulches for control of preemergent weeds in container grown nursery stock.

Materials and Methods. The herbicides were incorporated on milled pine bark mulch at several levels calculated to deliver a specific rate of active material on an acre basis (ai / A) when the mulch was employed at a depth of ½ inch. To insure uniform mixing, the herbicides in 200 ml of water, were sprayed on ½ cu ft of pine bark with an atomizer while the material was tumbling in a 1 cu ft concrete mixer. Following the incorporation of the herbicides on the pine bark mulch, the material was stored in sealed plastic bags until applied to the containers. Herbicides impregnated on the pine bark mulch in this study included: N, N-dimethyl -2, 2-diphenylacetamide (diphenamid) at 5 and 20 lb ai / A, isopropyl-m-chlorocarbanilate (CIPC) at 2 and 8 lb ai / A, dipropylthiocarbamate (EPTC) at 5 and 20 lb ai / A, isopropyl-m-chlorocarbanilate+P-chloropene-N-methylcarbamate (CIPC +PPG-124) at 2 and 8 lb ai / A, and dichlobenil at 4 and 12 lb ai / A.

Both species employed in this test, *Rhododendron obtusum* Planch. *amoenum* Rehd 'Hino Crimson' and Japanese holly were treated as individual experiments and arranged in a completely randomized design. A total of 10 treatments were included in each experiment with both mulched and non-mulched controls. All treatments were replicated 3 times with 3 plants constituting 1 treatment replicate. The study was initiated on April 9, 1970, and April 8, 1971, with data on weed control and plant size recorded 150 days after treatment application. Analysis of variance and Duncan's Multiple Range Test were applied to delineate treatment effects.

Both plant species were uniform rooted cuttings at the time the experiment was initiated and were potted in 1 gal nursery containers in a soil mix consisting of unsterilized weed-infested soil, sand and peatmoss (2:1:1 v / v / v). Following treatment with the herbicide impregnated mulches, all plants were placed in a lathhouse (50% shade) for the duration of the experiment. Standard nursery practices were employed in the fertilization and maintenance program.

The principal weed species observed during the course of this experiment were large crabgrass (*Digitaria sanguinalis* (L) Scop.), goose grass (*Eleusine indica* (L). Gaertn.), crowfoot grass (*Dactyloctenium aegyptium* (L). Richter), carpetweed (*Mollugo verticulata* L.), common ragweed (*Ambrosia artemisiifolia* L.), yellow nutsedge (*Cyperus esculentus* L.), chickweed (*Stellaria media* (L).

Cyrillo) and common yellow woodsorrel (*Oxalis stricta* L.). Visual ratings of the weed growth were employed to estimate the herbicide-mulch effectiveness, with 0 designating no control and 10 complete control.

Results. All herbicide-impregnated mulches adequately controlled the broadleaf weeds in the container-grown Japanese holly during the 1970 test. Similar results, with the exception of CIPC at the 2 lb ai / A rate, were observed during 1971 (Table 2).

In both 1970 and 1971, grass weeds in the container-grown Japanese holly were effectively controlled by the use of CIPC + PPG-124 at 8 lb ai/A, EPTC at 5 and 20 lb ai / A, CIPC at 8 lb ai / A, dichlobenil at 4 and 12 lb ai / A, and diphenamid at 20 lb ai / A. Both years, CIPC and CIPC + PPG-124 at the 2 ai / A rates were significantly poorer in controlling grass weeds when compared to the other herbicide treatments (Table 2). During both 1970 and 1971, grass weeds were unchecked in either the mulched or non-mulched control (Table 2).

Growth of the Japanese holly was significantly reduced by the dichlobenil impregnated mulch at 12 lb ai / A when compared to all other treatments. Significant height reductions in the Japanese holly plants resulting from poor overall weed control (i.e. excessive weed growth) were observed in the following treatments: CIPC + PPG-124 and CIPC both at the 2 lb ai / A rate, non-mulched control, and ½" untreated mulched control (Tables 2 and 3).

Due to a poor stand of broadleaf weeds in 1970, no significant differences among the various treatments were observed on the azaleas. In 1971, all the herbicide-impregnated mulches with the exception of EPTC at the 5 lb ai / A rate adequately controlled the broadleaf weed population in the azaleas (Table 2).

Good grass weed control in the azaleas was achieved both years with the use of CIPC + PPG-124 at 8 lb ai / A, EPTC at 5 and 20 lb ai / A CIPC at 8 lb ai / A, dichlobenil at 4 and 12 lb ai / A and diphenamid at 20 lb ai / A. Both the mulched and non-mulched controls exhibited excessive grass weed growth (Table 2).

Dichlobenil at the 12 lb ai / A rate caused severe damage to the azaleas both years as evidenced by the significant reduction in plant height (Table 3). The reduction in size of the azaleas when treated with EPTC at the 20 lb ai / A rate in 1970 was thought to be herbicidal damage; however, this phenomenon was not observed in 1971. Excessive weed growth (i.e. poor overall weed control) during both years was thought to be responsible for some retardation of the azaleas when the following herbicide impregnated mulches were employed: CIPC + PPG-124 at 2 lb ai / A, CIPC at 2 lb ai / A and diphenamid at 5 lb ai / A (Table 3).

Table 2. **Effects of various herbicide-impregnated mulches on the control of weeds in container-grown 'Hino Crimson' azalea and Japanese holly.**

Herbicide	Rate lb ai / A	'Hino Crimson' azalea: Broadleaf Weed Control[x]		'Hino Crimson' azalea: Grass Weed Control		Japanese holly: Broadleaf Weed Control		Japanese holly: Grass Weed Control	
		1970	1971	1970	1971	1970	1971	1970	1971
Chlorpropham +	2	10 0 a[y]	10 0 a	7 7 ab	7 3 bc	9.7 a	9 7 a	5 3 b	6 3 bc
PPG124	8	9 7 a	9 7 ab	9 3 a	10 0 a	9 3 a	9 0 a	10 0 a	10 0 a
EPTC	5	9 3 a	8 0 b	9 3 a	10 0 a	9 7 a	9 0 a	8 3 a	10 0 a
	20	9 7 a	9 7 ab	10 0 a	10 0 a	9 3 a	9 3 a	9 6 a	10 0 a
Chlorpropham	2	10 0 a	9.3 ab	7 3 ab	9 3 ab	9 3 a	7.7 b	4.0 bc	5 3 cd
	8	10 0 a	9.0 ab	8 7 a	9.0 ab	9 0 a	9 0 a	8 3 a	9 7 a
Dichlobenil	4	10 0 a	10 0 a	9.7 a	10 0 a	10 0 a	10 0 a	8 8 a	9 0 ab
	12	10 0 a	10 0 a	10 0 a	10 0 a	10 0 a	10 0 a	9 6 a	10 0 a
Diphenamid	5	9 7 a	9 7 ab	9 0 a	8 0 abc	9 7 a	8 7 a	7 7 a	7 0 abc
	20	10 0 a	9 3 ab	10 0 a	10.0 a	9 0 a	8 7 a	9 3 a	9 0 ab
½" Untrtd Mulch		10 0 a	8 3 ab	5 7 b	6 0 cd	10.0 a	8.7 a	5 0 b	2 7 d
Non-Mulched Check		7 3 b	6 0 c	3 0 c	4 0 d	5 3 b	6 0 c	2 0 c	3 3 d

x/ Rating scale 0 = no control, 10 = complete control

y/ Means in a column followed by the same letter are not significantly different at the 5% probability level as determined by Duncan's Multiple Range Test

Table 3. Effect of various herbicide impregnated mulches on the height of container grown 'Hino Crimson' azalea and Japanese holly.

Herbicide	Rate lb ai / A	Avg. Plant Height (cm) Per Plot			
		'Hino Crimson' azalea		Japanese holly	
		1970	1971	1970	1971
CIPC + PPG-124	2	25.3 ab[x]	23.6 ab	24.4 bc	14.8 e
	8	27.5 a	26.4 a	29.1 ab	24.3 abcd
EPTC	5	28.7 a	25.5 ab	28.9 ab	26.3 abc
	20	18.7 b	24.3 ab	27.8 ab	22.1 bcde
CIPC	2	25.8 a	21.8 ab	19.6 bc	28.1 abc
	8	27.4 a	26.7 a	27.2 abc	25.4 abc
Dichlobenil	4	27.9 a	24.2 ab	23.1 bc	29.8 ab
	12	9.1 c	11.7 c	7.1 d	21.2 cde
Diphenamid	5	26.7 a	20.7 ab	29.9 ab	23.1 bcd
	20	28.4 a	24.3 ab	36.5 a	31.4 a
½'' Untreated Mulch	—	27.7 a	20.3 ab	16.9 cd	16.7 de
Non-Mulched Check	—	24.4 ab	17.7 bc	17.3 cd	14.2 e

x/ Means in a column followed by the same letter are not significantly different at the 5% probability level as determined by Duncan's Multiple Range Test.

PREEMERGENT HERBICIDE APPLICATION ON CONTAINER NURSERY STOCK

Review of Literature. Information on the use of herbicides to control preemergent weeds in containers is limited at the present time. Davidson and Rees (3) found granular dichlobenil, diphenamid, and *a, a, a*-trifluoro-2, 6-dinitro-N, N-dipropyl-p-toluidine (trifluralin) safe and effective for weed control of container-grown nursery stock while 2-chloro-4, 6-bis (ethylamino)-*s*-triazine (simazine) caused injury to several test species. Similarly, Ahrens (1) observed that granular diphenamid at 5 or 7.5 lb ai / A caused no injury to 44 species of container-grown nursery stock in his study, while granular dichlobenil at rates of 4 and 6 lb ai / A caused significant damage to *Rhododendron, Cotoneaster, Cytisus,* and various *Ilex* cultivars.

Experiments were conducted at the Georgia Station during the summer of 1970 and 1971 to investigate the use of several preemergent herbicides on container-grown nursery plants.

Materials and Methods. These studies were conducted using the following container-grown species: *Rhododendron obtusum* Planch. *amoenum* Rehd. 'Coral Bells' and Japanese holly.

The seven preemergent herbicides and their rates of application employed in this study were: diphenamid at 5 and 20 lb ai / A, CIPC at 2 and 8 lb ai / A, CIPC+PPG-124 at 2 and 8 lb ai / A, EPTC at 5 and 20 lb ai / A, dichlobenil at 4 and 12 lb ai / A, trifluralin at 2 and 8 lb ai / A and simazine at 1 and 4 lb ai / A.

Both container-grown species employed in this study were treated as individual experiments and arranged in a completely randomized design. All experiments were replicated 3 times with 3 plants constituting 1 treatment replicate. The studies were initiated on April 10, 1970, and April 1, 1971. Data on weed control and plant growth were recorded 163 days after application. Analysis of variance and Duncan's Multiple Range Test delineated treatment effects.

All herbicides were applied in 1.56 gal of water (equivalent to 0.1 acre inch of water) over a 25 sq ft area with a knapsack type sprayer. The ornamental species employed in this study were uniformly rooted cuttings at the time the experiment was initiated. Within the week prior to the application of all treatments, the cuttings were potted in one gal nursery containers in a soil mix consisting of equal parts on a volume basis of unsterilized soil, milled pine bark and sand. After application of the preemergent herbicides, all plants were placed in a lathhouse (50% shade) for the remainder of the experimental period. Standard nursery practices were employed in the maintenance and fertilization program. The principle weed species observed during the course of this experiment were: crowsfoot grass, large crabgrass, goose grass, yellow nutsedge, carpweed, chickweed, common yellow woodsorrel and common ragweed. Visual ratings of both broadleaf and grass weed growth were employed to rate the effectiveness of the preemergent herbicides, with 0 designating no control and 10 complete control.

Results. Treatments which resulted in the best control of broadleaf weeds in both Japanese holly and 'Coral Bells' azaleas during both test years were dichlobenil at both rates, trifluralin at 8 lb ai / A, simazine at both rates and diphenamid at 20 lb ai / A (Table 4).

Excellent grass weed control was achieved both years on both groups of container-grown plants with the use of dichlobenil at 12 lb ai / A, trifluralin at 8 lb ai / A, EPTC at both rates, and CIPC + PPG-124 at 8 lb ai / A. In most cases, the use of herbicides did give significantly better control of both broadleaf and grass weeds than the controls (Table 4).

During both years the Japanese holly and the 'Coral Bells' azaleas were significantly reduced in size due to the application of dichlobenil at the 12 lb ai / A rate. Similarly, the EPTC at the 20 lb ai / A rate significantly reduced the height of the azaleas both years, but had no effect on the Japanese hollies (Table 5).

LITERATURE CITED

1. Ahrens, J. F. 1966. Trials with dichlobenil and diphenamid for controlling weeds in container grown nursery stock. *Proc. N. E. Weed Cont. Conf.* 20:232-236.
2. Bing, A. 1965. The use of herbicides with mulches. *Proc. N. E. Weed Cont. Conf.* 19:167-172.
3. Davidson, H. and S. K. Ries. 1965. Granular herbicides for weed control in container grown woody ornamental plants. *Proc. N. E. Weed Cont. Conf.* 19?150-154.
4. Fretz, T. A. 1966. The incorporation of herbicides into organic mulches for weed control in ornamental plantings. Masters Thesis, University of Delaware, Newark. p. 54.
5. Lanphear, F. O. 1968. Incorporation of dichlobenil in mulches. *Weeds* 16:230-231.
6. Staniforth, D. W. 1957. Effect of annual grass weeds on yield of corn. *Agron. J.* 49:551-555.

Table 4. Effects of various preemergent herbicides on the control of weeds in container grown 'Coral Bells' azalea and Japanese holly.

Herbicide	Rate lb ai / A	'Coral Bells' azalea Broadleaf Weed Control—x 1970	'Coral Bells' azalea Broadleaf Weed Control—x 1971	'Coral Bells' azalea Grass Weed Control 1970	'Coral Bells' azalea Grass Weed Control 1971	Japanese holly Broadleaf Weed Control 1970	Japanese holly Broadleaf Weed Control 1971	Japanese holly Grass Weed Control 1970	Japanese holly Grass Weed Control 1971
Dichlobenil	4	9 8 a—y	10 0 NS—z	8 5 ab	9 0 a	10 0 a	8 7 abcde	6.7 cd	8 7 abc
	12	10 0 a	10 0	8 7 ab	10 0 a	10 0 a	9 7 ab	8 7 ab	10 0 a
Trifluralin	2	5 3 e	9 7	7 5 bc	10.0 a	9 0 a	9.7 ab	9 0 ab	10.0 a
	8	9 3 ab	10 0	8 3 ab	10 0 a	10.0 a	10.0 a	8 8 ab	10 0 a
CIPC	2	8 1 bcd	9 7	7 3 bc	10 0 a	8 8 a	6 7 f	6 0 cd	7 7 abc
	8	8.1 bcd	10 0	6 5 bc	10 0 a	10 0 a	7 7 cdef	5.5 de	6.3 bcd
EPTC	5	9 0 ab	9 0	7 8 bc	9 7 a	8 8 a	7.3 def	9 0 ab	9 0 abc
	20	8 6 abc	8 7	8.7 ab	10.0 a	10.0 a	6.7 f	9 5 a	9.0 abc
CIPC + PPG-124	2	7 3 cd	9.3	6 8 bc	8.0 a	9.0 a	7.3 def	7 2 c	8 7 abc
	8	8 2 bcd	10 0	8 7 ab	10 0 a	9 5 a	8 0 bcdef	9 3 a	10 0 a
Simazine	1	9 5 ab	9 7	5.7 cd	8 3 a	10 0 a	9 0 abcd	4.3 e	5 7 cd
	4	9 5 ab	9 3	7.3 bc	10.0 a	9.0 a	9 3 abc	5 3 de	7 0 abc
Diphenamid	5	9 7 ab	9 0	9 7 a	10.0 a	6.0 b	8.0 bcdef	7 5 bc	9 7 ab
	20	9 7 ab	10 0	9 7 a	10 0 a	10 0 a	8 7 abcde	10 0 a	6 7 abc
Control		7 0 d	8 3	3 8 d	4 0 b	7 0 ab	7 0 ef	4 0 e	3 3 d

x/ Rating scale. 0 = no control, 10 = complete control

y/ Means in a column followed by the same letter are not significantly different at the 5% probability level as determined by Duncan's Multiple Range Test

z/ Not significantly different at the 5% probability level.

Table 5. Effect of various preemergent herbicides on the height of container grown 'Coral Bells' azalea and Japanese holly.

Herbicide	Rate lb ai / A	Avg. Plant Height (cm) Per Plot: Coral Bells azalea 1970	Coral Bells azalea 1971	Japanese holly 1970	Japanese holly 1971
Dichlobenil	4	29.7 abc[x]	34.0 ab	14.6 cde	24.4 a
	12	25.5 cde	11.1 c	3.5 f	5.3 b
Trifluralin	2	28.2 abcd	34.6 ab	20.2 bc	25.7 a
	8	24.6 cd	27.2 b	17.7 cd	22.7 a
CIPC	2	29.7 abc	37.2 a	11.6 de	21.4 a
	8	23.8 d	36.3 ab	15.3 cde	22.1 a
EPTC	5	28.2 abcd	33.4 ab	14.9 cde	18.5 a
	20	1.9 e	1.9 d	17.9 c	20.7 a
CIPC + PPG-124	2	23.9 d	41.1 a	16.6 cde	21.6 a
	8	25.3 bcd	36.0 ab	17.6 cde	28.8 a
Simazine	1	28.0 abcd	43.3 a	11.3 e	21.6 a
	4	31.3 a	41.3 a	14.2 cde	24.4 a
Diphenamid	5	31.6 a	42.2 a	27.2 a	23.1 a
	20	30.6 ab	42.2 a	25.3 ab	19.2 a
Control	—	25.0 bcd	38.7 a	15.0 cde	18.2 a

x/ Means followed by the same letter are not significantly different at the 5% probability level as determined by Duncan's Multiple Range Test.

ARIE RADDER: How long did you get control with the materials you were using?

TOM FRETZ: We were still getting pretty good control with most of the materials at the end of 75 days, but some of the materials were beginning to break down.

ARIE RADDER: We have been using Trifluralin for a number of years now and we find that it has a longer residual action than any of the other materials we have tried.

DICK AMMONS: Would there be any merit to spreading your mulch out on a driveway and spraying it with Trifluralin and then using it to mulch the cans?

TOM FRETZ: We haven't done this, but other workers have done similar things such as mixing the Trifluralin with the mulch. You do, of course, get some weed control from the mulch itself. I don't incorporate my Trifluralin, but I do use a water seal; that is, water is applied immediately after applying the Trifluralin.

RALPH SHUGERT: I want to emphasize your statement concerning the difference in the cost of control between grasses and broadleaf weeds. Having chemically weeded seed beds for the past 10 or 12 summers, I have found that costs are tremendously higher when attempting to control grasses. Dacthal in my opinion is a tremendous help in grass control, but what Dacthal would do in cans I don't know since I have had no experience with it.

TOM FRETZ: We have tests in which we are using Dacthal. We have used it at tremendously high rates, but I cannot say that I am very well pleased with it; thus far it has been very erratic and others that I have talked to have found the same thing.

MODERATOR FLEMER: Our next paper also deals with container growing and it concerns lightweight media for containers. It will be presented by one of our old stand-by members, Mr. Harvey Gray.

LIGHT WEIGHT MEDIA FOR CONTAINER GROWING OF ERICACEOUS PLANTS

HARVEY GRAY

State University of New York
Farmingdale, New York

The production of containerized woody plants with the desired soil mixes is a major operation. If the plants to be marketed in containers could be grown in a medium in beds, properly spaced, much of the labor might be reduced. Plants grown in beds are easier to care for, particularly in regard to watering and fertilizing. The following remarks are made with these points in mind.