ever, did not seem to be affected by the spray treatment.

Phytotoxicity resulting from the 200 ppm concentration was too severe on all varieties. It caused some twig die-back and subsequently delayed flowering and foliation. Slight-to-moderate phytotoxic effects were displayed by trees sprayed with 100 ppm.

Leaf and flower buds on representative branches of three varieties were counted separately in March 1967. The data in table 2 show that the numbers of leaf buds per inch of growth were not affected by gibberellic acid treatment.

The numbers of flower buds, however, were markedly decreased; the Palora variety showing about 45% reduction even at 50 ppm. The Halford variety, having fewer flower buds per linear inch, also showed a considerable reduction at 50 ppm.

There was no carry-over effect on the new vegetative growth made by the trees in 1967. In May, 1967, the trees were rated as to the effectiveness of the gibberellic acid treatment in reducing crop levels on the trees. The 200 ppm treatment drastically overthinned all five cling varieties. The 100 ppm treatment overthinned and reduced crop levels in the Palora, Peak, and Halford varieties. The Fortuna and Loadel varieties, being heavy bloomers, showed moderate thinning.

The 50 ppm treatment on Palora reduced the crop enough that no supplemental hand thinning was necessary. Peak and Halford varieties rated from moderate to good in thinning. Fortuna and Loadel showed less thinning effect from the 50 ppm treatment and were rated at little or no thinning.

These trials demonstrated that gibberellic acid foliage sprays in July may also be able to control crop levels in cling peaches.

More extensive trials were established in July, 1967 following the preliminary trials in 1966. Concentrations of gibberellic acid in the 1967 trials were considerably reduced in line with the results obtained in 1966.

Gibberellic acid is not registered for the purpose used in this experiment. Registration of this material for this use will be necessary before it can be used commercially or recommended by University of California.

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ANNUAL LOSSES from weeds in California melon and cucumber crops were recently estimated at $11,000,000. The cost of controlling weeds in these crops by cultivation and hand hoeing was estimated at $20 per acre in 1964. Early weed competition in the field is difficult to control, particularly in the seed row and under hot caps. Once growing young vines spread out over the bed surface, mechanical cultivation becomes difficult to impossible.

In addition to weed germination with the crop seeds at emergence, there is a weed problem in the irrigation furrow and on the shoulder of the beds, which becomes more important during the summer and at harvest. While selective chemical weed control in the seed row is more difficult to obtain, weed control down in the furrow can be accomplished safely with a number of herbicides.

In a recent survey, the five important weeds most often listed as pests in melons were lambsquarter, pigweed, barnyard grass, other annual grasses, and mustard. Purslane was one of the main weeds frequently observed in University of California weed-control trials.

A series of uniform trials were conducted in several of the major melon and cucumber areas in the state including Fresno, Tulare, Kern, and San Joaquin counties. These trials included a preplant, incorporated application of the registered herbicides, CDEC (Vegadex) and NPA (Alanap), and of the three unregistered herbicides, bensulide (Prefar), benefin (Balan), and R 1856. These herbicides were incorporated shortly after application on tops of preformed beds. Nearly all the trials were furrow irrigated as is common practice in most melon-growing acreage in California.

The second set of uniform trials for preemergence weed control on the shoulder and in the furrow was conducted in some of the same counties. In these trials melon plants were seeded and grown to a height of 4 to 5 inches before herbicide application. Postplant herbicides were trifluralin (Treflan), registered for application 4 to 6 weeks after seeding; and nitralin (Planavin), an unregistered herbicide related to trifluralin.

Among the registered herbicides, CDEC (Vegadex) showed a narrow margin of safety for weed control in the seed row. Although the number of trials was somewhat limited, there were more failures than successes at 4 lbs per acre (table 1). NPA (Alanap), long registered for weed control in melons, likewise showed erratic results and less crop safety than some of the more promising new herbicides. DCPA (Dacthal), although registered only for postplant applications, offered marginal safety, for preplant incorporation, and excellent weed control in all trials at rates from 8 to 16 lbs per acre. However, DCPA has shown no selectivity in light, low-organic-matter soils, in previous trials.

Benefin (Balan), another unregistered herbicide, although giving excellent weed control, showed insufficient safety even at rates of 1 lb per acre. R 1856, although safe on cucurbits, showed generally poor weed control.

Among the unregistered herbicides, bensulide (Prefar) was one of the safest and gave fairly consistent weed control, particularly when watergrass and purslane were the main weeds present. Four- to 5-lb-per-acre rates were effective in seven out of 11 trials. In heavier soils more herbicide would probably be necessary depending upon the weed species

TABLE 1. CUCURBITS WEED-CONTROL SUMMARY 1964–66

Herbicide	lb/A	Number of trials			
		Weed control (+)	Weed control (–)	Crop safety (+)	Crop safety (–)
CDEC	4	1	2	2	2
NPA	4–5	2	1	4	2
	8–10	2	1	3	3
BENSULIDE	4–5	7	4	12	0
	8–10	10	1	11	1
DCPA	8–10	6	0	4	2
	16	5	0	0	5
BENEFIN	1	8	1	4	5
	2	8	0	2	7
R 1856	4	1	7	7	0
	8	3	5	7	0

+ = Satisfactory.
– = Unsatisfactory.

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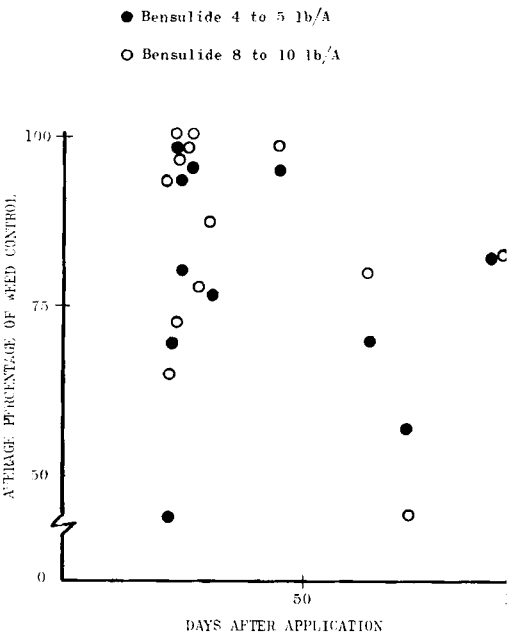
Bensulide (Prefar) was the most promising of the preplant herbicides tested for selective weed control in melons. It is not yet registered, however, and is not recommended by the University of California. Of the postplant herbicides tested, trifluralin (Treflan) and nitralin (Planavin) gave commercial weed control with considerable safety, when incorporated with a rolling cultivator after planting. Trifluralin is registered for use in curcurbits (except for watermelon) at the "lay-by" or 3-to 4-leaf stage of development. Planavin is not registered—and neither chemical is recommended for use by the University of California at this time.



present. In one trial showing some stunting at the 10-lb-per-acre rate, damage was not severe.

In evaluating bensulide (the herbicide with most consistent and greatest degree of safety) all the weed control data were placed on a diagram covering approximately 100 days. Bensulide generally gave commercial (above 70%) weed control (see graph). Where bensulide gave less than satisfactory weed control, difficulties such as poor soil preparation, herbicide incorporation, or resistant weed species were observed. Bensulide was weak on early spring weeds such as shepherdspurse, London rocket, and some of the broadleaf summer weeds such as nightshade and ground cherry. It was particularly effective on purslane and barnyardgrass. Bensulide, when incorporated, has the disadvantage of being a long-residual herbicide. At 4 lbs per acre effects have lasted as long as a year in some soils when replanted with susceptible crops. Since most of the broadleaf crops are resistant to bensulide, the persistent nature of bensulide would only be a problem when susceptible crops such as milo, sugar beets, and corn were planted. Resistant crops include alfalfa, beans, tomatoes, peppers, safflower, and others not yet evaluated.

In many melon fields the major weed-control problem from midsummer on is on the shoulders and the furrows. By applying an herbicide on the shoulder of the bed and into the furrow near young melon plants 4 to 6 inches in height, and incorporating the herbicide with a rolling cultivator, good weed control was obtained from trifluralin (Treflan) at 1 lb per acre in 1965, 1966, and 1967 trials. Planavin at 1 lb per acre showed considerable weed control in 1966 and 1967 trials (tables 2 and 3). Generally, trifluralin offered good weed control without significant injury. In one test, the 1.5-lb-per-acre rate and in a second test the 3-lb-per-acre rate of trifluralin showed what appeared to be some reduction in yield. There was also an apparent reduction in percentage of soluble solids as the 3-lb-per-acre rate of trifluralin. Planavin, up to the highest rate (2 lbs per acre), showed no problem from postplant incorporated applications, and weed control was generally comparable to that of trifluralin.

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TABLE 2. 1966 CANTALOUPE WEED-CONTROL AND YIELD DATA, FROM POSTPLANT HERBICIDE APPLICATIONS*

Herbicides	Rate	Pigweeds in plots	Weed-control rating	Melons in 25 ft of row	Weight of melons in 25 ft row	Yield percent of check
	lb/A	No.		No.	lb	%
Trifluralin	0.5	24.2 ab	8.0 bc	44.8	83.4	105
	1.0	9.2 a	9.0 ab	54.2	84.7	105
	1.5	2.2 a	9.5 a	45.2	70.2	89
Planavin	0.5	16.8 ab	7.5 c	48.2	80.1	101
	1.0	42.2 b	7.5 c	42.2	69.3	87
	1.5	5.0 a	9.5 a	52.2	83.0	104
Untreated	...	92.5 c	2.2 d	48.2	79.4	...
Co-efficient of variance		71%	7%			

* Values are the average of four replications and are not significantly different (at LSD .05) when followed by the same subscript letters. Weed-control rating based on scale of 0–10 where 0 = no control, 10 = perfect control. Cantaloupes planted, June 30, 1966; herbicides applied, August 3, 1966; harvested and evaluated, September 20, 1966. Cantaloupes were picked in 25 ft of row in the center of each 75-ft plot.

TABLE 3. 1967 CANTALOUPE WEED-CONTROL AND YIELD DATA FOLLOWING TRIFLURALIN AND PLANAVIN (POSTPLANT) APPLIED IN 3- TO 4-LEAF STAGE*

Herbicide	Rate	Weed-control rating†	No. of melons	Weight	Weight per melon	Percent soluble solids
	lb/A		No.	lbs	lbs	%
Trifluralin 4EC	0.5	8.2 c	43	89.7 abc	2.09	10.3 ab
	1.0	8.5 ab	49	106.4 a	2.17	9.9 ab
	2.0	9.0 a	47	90.2 abc	1.91	9.6 ab
	3.0	9.0 a	45	86.8 abc	1.93	8.7 b
Planavin 75 WP	0.5	8.2 c	48	102.5 ab	2.14	11.1 a
	1.0	9.0 a	44	80.7 c	1.84	9.3 ab
	2.0	9.0 a	48	99.0 abc	2.06	11.0 a
Untreated	0	0.5 d	45	82.6 bc	1.84	9.3 ab
	0	3.2 d	45	92.3 abc	2.08	10.6 a
LSD. (.05) 05			N.S.			
Co-efficient of variance		4%	9.4%	13.9%		11.6%

* Average of four replications, harvested area—5 ft by 25 ft, variety SJ 45; values followed by same subscript letters are not significantly different at LSD .05. Planted, May 3, 1967; treated, June 2, 1967; harvested, July 31, 1967.

† Weed control ratings based on scale of 0 to 10 where 0 = no control, 10 = perfect control.