PRELIMINARY-NOT FOR PUBLICATION

TREE FRUIT WEED CONTROL - PROGRESS REPORT TO 1960

by Oregon Agricultural Experiment Station
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Weed control plots were started in several orchards in 1959 with the emphasis on establishing new orchards. Since most of these plantings were made in fields with established perennial weeds it was desirable to have a herbicide program which would be effective on established weeds as well as being effective over a longer period of time on germinating seedlings. For this reason most of the herbicide treatments are combinations of compounds. The details of these tests are included in the following tables. These tests are continuing with more information, particularly on tree response, yet to be obtained.

Willamette Valley

Treatment List
(Rates are pounds active per acre sprayed)

Treatment No.	Herbicide	Rate	Timing
1	Simazine	4	Fall
2	Simazine	4	Spring
3	Simazine	2	Spring plus 2 Fall
4	Simazine	4	Fall plus Amitrole 5 Fall
5	Simazine	4	Spring plus Amitrole 5 Spring
6	Simazine	2	Spring plus 2 Fall plus Amitrole 5 Fall
7	Simazine	2	Spring plus 2 Fall plus Amitrole 5 Spring
8	Simazine	2	Spring plus 2 Fall plus Amitrole 5 Spring plus 5 Fall
9	Diuron	4	Fall
10	Diuron	4	Spring
11	Diuron	2	Spring plus 2 Fall
12	Diuron	4	Fall plus Amitrole 5 Fall
13	Diuron	2	Spring plus 2 Fall plus Amitrole 5 Fall
14	Untreated check		
15	Untreated check		

Plots consist of a single tree with a 6' x 6' square area sprayed at the base of tree except location A below which has 12' x 12' plots. Location A is planted with a subclover sod; all others use a winter cover crop which is worked down in the spring and maintained fallow during the summer. Spring applications are usually applied in April, Fall applications in October. The treatments listed above were applied to the following list of orchards in the Willamette Valley in 1959 and 1960.

	Location	Crop	Planting Date
A	Polk County	Prunes	1955
B	Polk County	Prunes	1957
C	Polk County	Prunes	1959
D	Marion County	Prunes	1959
E	Marion County	Pears	1959
F	Marion County	Sour Cherries	1959
G	Marion County	Sweet Cherries	1958

General weed control ratings(0 = no response, 10 = complete kill) were made in 1960 on orchards B, C, D, E, and F. Tree growth response on D, E, and F. Averages of these ratings are summarized in the following table.

Treatment No.	Ave. Weed Control Rating	Ave. Crop Response Rating
1	7	1
2	3	2
3	7	2
4	8	1
5	6	2
6	8	1
7	8	2
8	9	1
9	6	3
10	4	2
11	8	2
12	7	3
13	8	1
14	2	3
15	2	3

It will be noted that tree response ratings are largely a reflection of weed competition effects. However, in these three orchards weeds were relatively well controlled culturally and the trees did not suffer greatly from weed competition. None of the chemical treatments appeared to injure the trees except by their lack of weed control.

In general, fall applied treatments show better weed control in the Spring than spring applied treatments; and conversely spring applied treatments show better weed control in the Fall. Spring and fall split applications give the best weed control on an entire year basis.

A sweet cherry planting was made in Marion County in 1959 in an area heavily infested with quackgrass (*Agropyron repens*). The following treatments were applied as 6' x 6' areas around individual trees in April and October 1959. Eptam (treatment Nos. 1, 2, and 3) was thoroughly incorporated into the soil by a rotary tiller.

Treatment No.	Herbicide - Rate - Timing
1	Eptam 6 lbs. Spring
2	Eptam 6 lbs. Spring plus Amitrole 5 lbs. Fall
3	Eptam 6 lbs. Spring plus Dalapon 5 lbs. Fall
4	Diuron 4 lbs. plus Amitrole 5 lbs. Spring
5	Diuron 4 lbs. plus HCA 2% m Diesel oil Spring
6	Black polyethylene mulch
7	Untreated check
8	Rotary tilled check

In April 1960 weed control was evaluated with the results as follows:

Treatment No.	Ave. Weed Control Rating (mixed annual broadleaf and grass weeds)	Acceptable quackgrass control
1	2	x
2	7	x
3	6	x
4	2	
5	2	
6	8	x
7	1	
8	0	

No effects were noted on tree response.

An experiment was started in 1958 on an established peach planting at Corvallis. The following treatment list was used.

Treatment No.	Herbicide - Rate - Timing
1	Simazine 2 lbs. Fall annually
2	Simazine 4 lbs. Fall annually
3	Simazine 8 lbs. Fall annually
4	Simazine 4 lbs. Fall plus 4 lbs. Spring annually
5	Simazine 8 lbs. 1958 Fall plus as needed thereafter
6	Untreated check
7	Untreated check

These were applied as a 4' wide continuous strip centered on the tree rows.

By Fall 1959 weed control effectiveness had decreased in treatment No. 5 so that an additional application was made, thereby making it equal to treatment No. 3. The two pound rate of simazine (treatment No.1) did not give complete control of annual weeds during the winter but would probably be commercially acceptable under the conditions of this test. None of the treatments gave complete control of red sorrel (*Rumex acetosella*) or filare (*Erodium cicutarium*) although some control was obtained at the higher rates of simazine.

No effects were noted on any of the established peach trees. In 1960 some new trees were set as replacements in the orchard with no attempt to avoid using treated soil in filling around the roots of the trees. Many of these trees developed chlorosis during the growing season; the severity of the injury was proportional to the amount of simazine applied. This chlorosis had largely disappeared toward the end of the 1960 growing season, particularly in the less severely affected trees.

Mid-Columbia Branch Experiment Station, Hood River

The following herbicide treatments were applied on a new planting of apple trees, starting in the Spring of 1959.

Treatment No.	Herbicide	Rate	Timing
1	Amitrole	5 lbs.	Fall
2	Amitrole	5 lbs.	Spring
3	Amitrole	5 lbs.	Spring plus 5 lbs. Fall
4	Simazine	4 lbs.	Fall
5	Simazine	4 lbs.	Spring
6	Simazine	4 lbs.	Spring plus 4 lbs. Fall
7	Simazine	4 lbs.	Fall plus Amitrole 5 lbs. Fall
8	Simazine	4 lbs.	Spring plus Amitrole 5 lbs. Spring
9	Simazine	2 lbs.	Fall plus Amitrole 5 lbs. Fall
10	Simazine	2 lbs.	Spring plus Amitrole 5 lbs. Spring
11	Simazine	2 lbs.	Spring plus 2 lbs. Fall plus Amitrole 5 lbs. Spring plus 5 lbs. Fall
12	Simazine	2 lbs.	Spring plus 2 lbs. Fall plus Amitrole 5 lbs. Fall
13	Diuron	4 lbs.	Fall
14	Diuron	4 lbs.	Spring
15	Diuron	4 lbs.	Spring plus 4 lbs. Fall
16	Diuron	4 lbs.	Fall plus Amitrole 5 lbs. Fall
17	Diuron	4 lbs.	Spring plus Amitrole 5 lbs. Spring
18	Diuron	2 lbs.	Fall plus Amitrole 5 lbs. Fall
19	Diuron	2 lbs.	Spring plus Amitrole 5 lbs. Spring
20	Diuron	2 lbs.	Spring plus 2 lbs. Fall plus Amitrole 5 lbs. Spring plus 5 lbs. Fall
21	Diuron	2 lbs.	Spring plus 2 lbs. Fall plus Amitrole 5 lbs. Fall
22	Neburon	4 lbs.	Fall plus Amitrole 5 lbs. Fall
23	Atrazine	4 lbs.	Fall plus Amitrole 5 lbs. Fall
24	Untreated check		
25	Untreated check		

These herbicide applications were made as 6' x 6' plots at the base of individual trees. Additional surfactant was added to all applications containing Amitrole. Trunk caliper increases were measured in January, 1961 (for two years growth) and ratings of weed control, leaf color, and shoot growth were made in July, 1960. This information is summarized in the following table.

Treatment No. (order of tree caliper increase)	Ave. tree Caliper increase (mm)	Ranges of no Significant differences at 1% probability level (Duncan) (caliper increase)	Ave. Weed control Rating (1=no effect, 10=complete kill)	Ave. Leaf color Rating (1=yellow 2=lt. green 3=normal)	Ave. shoot Growth Rating (1=under 6" 2=6" - 12" 3=12"- 18" 4=18"- 24" 5=24" & over)
25	18.8		2.0	3.0	2.3
24	20.8		2.0	3.5	3.0
1	22.0		1.3	3.0	2.8
22	34.0		2.8	4.0	4.0
9	35.3		5.5	4.3	4.3
4	37.3		5.8	4.3	3.8
5	38.0		5.3	4.0	4.3
13	38.0		5.8	4.3	3.5
23	39.5		3.5	4.5	4.0
16	40.8		7.0	4.8	4.0
7	42.5		7.3	5.0	3.8
18	42.5		4.0	4.0	4.0
3	45.5		5.3	4.3	4.3
2	45.8		5.0	4.0	3.8
12	47.5		9.0	4.8	4.3
6	48.5		10.0	5.0	4.5
14	49.5		7.3	4.0	4.3
21	49.5		8.0	4.8	4.3
15	53.0		9.0	5.0	4.3
8	61.0		9.5	4.8	4.8
10	61.0		8.5	4.8	4.5
11	61.8		9.8	4.8	4.8
17	62.5		9.5	5.0	5.0
20	65.3		9.8	4.5	4.8
19	71.0		9.0	4.3	4.5

The competitive effects of weeds on tree response is strongly evident from the comparison of weed control ratings with other response measures in the above table. The tendency for spring applied or split, spring and fall, applied treatments to give better tree response than fall applied treatments would suggest that competition from weeds during the first summer was significant. This effect may be less pronounced over a greater period of treatment. The inclusion of amitrole improved weed control and tree response compared to the use of residual herbicides alone.

A test to screen herbicide treatments for weed control in orchards, with emphasis on perennial grass control was set out on a newly planted orchard in the spring of 1959. Each plot was a 6' x 6' area at the base of a single tree. The treatments are listed in the following table.

Weed control ratings were made for general weed control in the first season and for quackgrass (Agropyren repens) control in the second season (0 = no effect, 10 = complete kill).

Chemical	Rate/acre	Ave. Weed Control Ratings June 1959	October 1959	Ave. Quackgrass Control
1. Diuron	4	5	4	3
2. Diuron	4 plus Diesel oil 150 gal	9	9	7
3. Diuron	4 plus 2% HCA in Diesel oil 150 gal	9	8	8
4. Diuron	4 plus 2% HCA in water 150 gal	7	7	7
5. 2% HCA in water	150 gal	2	0	2
6. 10% HCA in water	150 gal	6	3	2
7. Diuron	4 plus Amitrole-T 5	9	5	8
8. Diuron	4 plus Amitrole-T 2	9	6	8
9. Diuron	4 plus Amitrole 5	9	5	7
10. Diuron	4 plus Amitrole 5 plus 5% Colloidal x-77 in water 150 gal	9	6	9
11. Eptam	4 rotary tilled followed by Diuron 4	9	7	5
12. Untreated Check		0	8	5
13. Rotary tilled check		4	8	3

Southern Oregon Branch Experiment Station, Medford.

A test was established in 1960 on a newly planted nursery of one-year-old pear seedlings. Applications were made on April 7 and October 11 as overall sprays directly over the small trees. The following treatment list was used for each time of application.

Chemical	Rate/acre
Simazine	2
Simazine	4
Simazine	8
Diuron	2
Diuron	4
Diuron	8
CIPC	6
Untreated Check	

Early summer observation of the spring applications showed acceptable weed control in all herbicide plots except the CIPC. Weed species present were chickweed (Cerastium sp), redroot pigweed (Amaranthus retroflexies), knotweed (Polygonum ariculare), and lambsquarters (Chenopodium album). All herbicide treatments except the 2 pound per

acre rates of simazine and diuron showed some tree damage. Plants in the 4 pound per acre rate of simazine had recovered by October to a degree that no injury was evident at that time.