

Runcina VOL.
17

**Evaluation of Herbicides
for
Vegetation Management
in
FIG
ORCHARDS**



A PROGRESS REPORT

**UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION
FRESNO COUNTY**

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Until the products and their uses given in this report appear on a registered pesticide label or other legal, supplementary direction for use, it is illegal to use the chemicals as described.

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Recommendations are based on the best information currently available, and treatments based on them should not leave residues exceeding the tolerance established for any particular chemical. Confine chemicals to the area being treated. **THE GROWER IS LEGALLY RESPONSIBLE** for residues on his crops as well as for problems caused by drift from his property to other properties or crops.

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Evaluation of herbicides for vegetation management in fig orchards was undertaken at the request of fig growers. This progress report is prepared to inform our cooperators of the progress of our studies. It is not intended and should not be interpreted as recommendations for the use of herbicides in fig orchards.

The generosity of Roger Jensen, President, S&J Ranch for supplying hundreds of potted rootings for the screening trials is appreciated.

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C O R R E C T I O N S

Please make the following additions and corrections in Runcina, Vol.17:

In the acknowledgements please add Stauffer Chemical Co.
They have generously supported our studies.

On Page 3 the last line of the caption for the top picture
should read: contour flood irrigation and not floor irrigation.

In Chart #1, page 7 it should read:

amitrole	not amtrole
napropamide	not napropamid
glyphosate	not glythosate

EVALUATION OF HERBICIDES FOR VEGETATION MANAGEMENT IN FIG ORCHARDS

A Progress Report

B. B. Fischer, G. L. Obenauf, M. H. Gerdtz, A. H. Lange

Fig trees were the earliest fruit trees cultivated by man. In Greek mythology the fig tree was sacred to the God of fruitfulness and vegetation, and at one time figs were men's principal sustenance in the Greek Peninsula.

Today few people consider fig trees to be sacred but they do provide livelihood for many people in Turkey, Greece, Portugal, Spain, Italy and Algeria where numerous varieties are grown. In the United States California produces over 99% of fig crops while Texas is the second leading producer. The major varieties grown in California are: Calimyrna, Adriatic, Mission and Kadota.

Approximately 90% of the figs raised in central California are utilized as dried figs. These are allowed to mature on the tree and drop to the ground from where they are picked up by hand or more commonly raked or swept into windrows and gathered with mechanical pickup machines. Other uses are for fresh consumption and canning; these fruits are harvested by hand from the trees.

Cultural practices in the management of the fig orchards vary greatly depending on the soil type, soil texture, level of the land, the weed population and most importantly the irrigation methods used.

Fischer and Obenauf are Farm Advisors in Fresno County; Marvin Gerdtz is Extension Pomologist; Art Lange, Extension Weed Scientist, both at SJVAREC, Parlier, all on the staff of the University of California Cooperative Extension.

Methods of Orchard Floor Management

The common method of controlling unwanted vegetation and preparing the orchard floor for harvest has been repeated disking, harrowing, land planing, cultipacking and rolling. This is accomplished by two-way disking to destroy the weeds between and within the tree rows. Often hand shoveling is required to destroy the vegetation adjacent to the tree trunks.



Repeated disking and harrowing are required to control the unwanted vegetation on the orchard floor.

Costly hand shoveling and hoeing are needed to control the weeds at the base of tree trunks.



Mechanical methods of weed control are effective but their effectiveness is short-lived and has to be done several times during the growing season. Repeated cross diskings can cause soil compaction, reduce water infiltration and adversely effect growth. Working close to the trees with heavy equipment can also cause injury to the tree trunk as well as to the lower branches.

Irrigation methods used in the orchards also vary depending on the soil texture, level of the orchard floor, the source, quality and quantity (head) of water available. Commonly used irrigation methods include furrow, basin flood, contour flood, sprinkler and low volume emitters (drip irrigation). Each method of irrigation requires different types of soil preparation and manipulation.



Basin flood irrigation pictured on the left require different land preparation than furrow or contour floor irrigation.

Water is applied through low volume emitters (drip irrigation) as shown on the right. Weed control is essential to effectively monitor their performance.



Regardless of the irrigation method, vegetation on the orchard floor must be controlled. In orchards where the fruit is harvested from the orchard floor the soil has to be properly prepared. It must be free of weeds, smooth and devoid of clods to insure efficient harvest. Fuel, equipment and labor costs significantly increased during the past few years. The cost of hand labor for hoeing weeds from the base of tree trunks is nearly prohibitive.



Fig orchard being prepared for harvest. The figs mature on the tree, drop to the ground and are picked up by hand or pickup machines.

For these reasons orchardists expressed interest in developing methods of vegetation management that would minimize the need for cross-cultivation and working close to the trees with heavy equipment. This method is used in other tree fruit orchards and has come to be known as "strip nontillage."

Evaluation of Herbicides

More than ten years ago several herbicides that were used in citrus orchards and vineyards were evaluated on rooted fig cuttings. Since that time numerous trials were conducted in newly planted and mature orchards. The tolerance

of fig trees to many herbicides were studied under furrow, flood, sprinkler and drip irrigations. The relative tolerance of fig trees to some of the herbicides evaluated is summarized in Chart 1, page 7.

In most of the trials, other than the early studies in pot cultures, the herbicides were applied with CO₂ constant pressure sprayers. In the large scale trials the herbicides were applied with commercial type spray equipment. All of the trials were replicated in randomized block design. Weed control ratings were made periodically during the growing season. The foliage of the figs was closely examined for signs of symptoms caused by the herbicides. A rating system of 0 to 10 was used where "0" denotes no evidence of herbicidal symptoms or injury, whereas "10" indicates very severe injury - resulting in death. Weed control ratings were also based on a 0 to 10 scale; 0=no weed control, 10=perfect weed control.

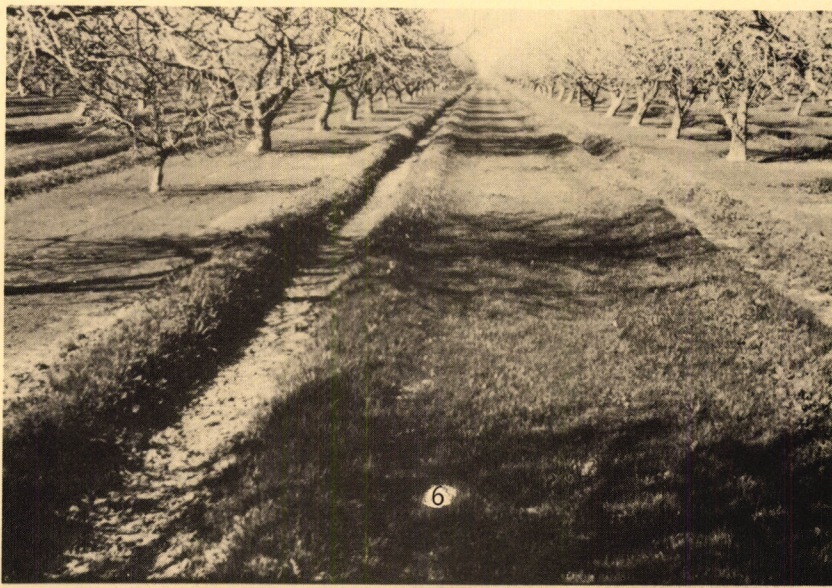
In the tables following the narrative part of this progress report, weed control and injury evaluations are presented from numerous trials. In the tables and throughout this report when rate of application is given, it is always in pounds of active ingredient per treated acre and is abbreviated as lb ai/A.



Typical symptoms on the foliage of figs caused by simazine. The veins are green but the interveinal areas are chlorotic (yellow) and the margins of the leaves are necrotic (brown-dead tissue).

The observations and evaluations made in all of the trials conducted may be briefly summarized as follows:

- . No one herbicide provided effective control of all weed species found infesting the fig orchards where the trials were conducted. (A chart listing the relative susceptibility of weeds to some of the herbicides evaluated is included in this report)
- . Combinations of herbicides provided the most effective broad spectrum weed control.
- . Effective weed control was most difficult to maintain around the emitters in drip irrigated orchards.
- . Several herbicides were found to be very toxic to fig trees - see Chart 1.
- . Numerous soil persistent and foliar applied contact and translocated herbicides were found to be well tolerated by newly planted fig rootings as well as young and mature trees. (See Chart 1.)
- . Devrinol, Rydex or Surflan in combination with Goal provided the most effective long residual control of a large spectrum of weeds under all methods of irrigation.



Devrinol in combination with Goal provided excellent weed control in a 10ft wide strip along the tree rows. Similar control was obtained with Surflan and Rydex in combination with Goal.

Chart #1

Relative Tolerance of Fig Trees to Herbicides
Evaluated in Applied Research Studies Conducted in Fresno County

<u>Names & Manufacturers of Herbicides</u>			<u>Fig Tree Tolerance</u>		
<u>Trade Name</u>	<u>Common Name</u>	<u>Manufacturer</u>	<u>Excellent</u>	<u>Moderate</u>	<u>Poor</u>
Aatrex	atrazine	CIBA-GEIGY	---	---	X
Amino Triazole Weedazol	amtrole	American Cyanamid Amchem	X	---	---
Casoron	dichlobenil	Thompson-Hayward	---	X	---
Cobex	dinitramine	US Borax	X	---	---
Dacthal	DCPA	Diamond Shamrock	X	---	---
Devrinol	napropamid	Stauffer	X	---	---
Dow General Sinox General	dinoseb (DNBP)	Dow FMC	X	---	---
Goal	oxyfluorfen	Rhom & Haas	X	---	---
Hyvar X	bromacil	DuPont	---	---	X
Igran	terbutryn	CIBA-GEIGY	---	---	X
Karmex	diuron	DuPont	---	---	X
Kerb	pronamide	Rohm & Haas	X	---	---
Paraquat	paraquat	Chevron Chem	X	---	---
Princep	simazine	CIBA-GEIGY	---	---	X
Probe	methazole	Velsicol	---	---	X
Ronstar	oxadiazon	Rhodia, Inc.	X	---	---
Roundup	glythosate	Monsanto	X	---	---
Rydex	prodiamine	US Borax	X	---	---
Sinbar	terbacil	DuPont	---	---	X
Surflan	oryzalin	Elanco	X	---	---
Tolban	profluralin	CIBA-GEIGY	X	---	---
Treflan	trifluralin	Elanco	X	---	---

Experimental herbicides whose development are not being pursued are not listed.

- . Ronstar in combination with Devrinol or Surflan provided very good weed control.
- . Effective weed control was obtained by using Devrinol, Rydex, Surflan or Goal singly followed by foliar treatments of the surviving weeds.
- . Devrinol, Rydex and Surflan did not control established weeds. The addition of a contact or translocated herbicide was necessary. Paraquat, Roundup, Dinoseb and amitrole were found to be effective and compatible with these herbicides.
- . Goal provided effective postemergence control of broad-leaf weeds and grasses in their seedling stage of growth.
- . With the use of foliar applied herbicides, whether contact or translocated, the younger the annual weeds at the time of treatment the more effectively were they controlled.
- . Roundup was the most effective herbicide for the control of perennial weeds. The best control of bermudagrass, johnsongrass and field bindweed was obtained if treated during summer when the plants were growing vigorously.
- . Treflan shallow (2" to 4") incorporated prior to planting fig rootings provided excellent control of weeds susceptible to this herbicide without causing any visible injury or growth retardation.

- . The most effective weed control was obtained when the soil active herbicides were applied prior to shedding of the fig leaves.
- . Application following shedding of the leaves resulted in erratic distribution of the herbicides. Emergence of weeds under the decaying mat of leaves was observed.
- . Devrinol, Rydex and Surflan provided the most effective control when rainfall occurred or irrigation water was applied over the treated areas soon after their application.

In the following tables the results obtained in several trials are summarized. The soil type, plot size, herbicides used, rates per acre applied, methods of irrigation used and dates of treatments and evaluations are also presented.



Herbicides applied prior to shedding of the fig leaves provided excellent control of annual weeds. In the above pictured trials the herbicides were applied in 4' strips on each side of the tree row.

Conclusions

The effective use of selective herbicides for the control of unwanted vegetation in fig orchards was clearly demonstrated in numerous trials under varied soil management and irrigation practices. Several herbicides were found to be selective when used in newly planted as well as older fig orchards as shown in Chart 1. However, their use in commercial orchards must await their registration by the Environmental Protection Agency.

The need for repeated tillage and/or hand shoveling near tree trunks can be significantly reduced or eliminated with the intelligent use of selective herbicides.

It appears feasible to use selective herbicides for strip nontillage to treat a 6 to 10 ft strip of soil along the tree rows and eliminate the need for cross tillage. They could be used in limited areas (4'x4' or 8'x8') around the tree trunks.



A 10ft strip of soil treated with selective herbicides pictured above. Herbicide was applied in a 4'x4' area around the tree in the picture on the left.

The timing of the herbicide application in a fig orchard may be critical and require advanced planning. To effectively use a soil active residual herbicide it is essential to distribute it evenly on the soil surface when it is relatively free of trash or foliage. Fallen leaves can intercept herbicides and prevent them from being evenly distributed because they are large, coarse and slow to decay. Raking or blowing the leaves from the treated areas prior to the application of the herbicides have been very effective. The orchard floor is the cleanest immediately following harvest, therefore that would be the best time to apply the herbicides.

Irrigation or rainfall soon after the application of certain herbicides is essential to prevent their photo-decomposition or volatilization and to leach them into the top 1 to 2 inches of soil where weed seeds germinate.

Under drip irrigation the residual activity of the herbicides was much shorter than under other methods of irrigation. Annual grasses and pigweeds were the most troublesome in the areas around the emitters where the soil was saturated for long periods of time. Repeated treatments with foliar applied contact or translocated herbicides were necessary to maintain good weed control. In limited studies in fig and other drip irrigated orchards, it was also found that in the areas wetted by the emitters a second application of the soil persistent herbicides in late May or early June provided good seasonal control of the annual weeds.

Herbicides have been developed that could be used safely and effectively in newly planted and in older fig orchards. However, knowledge of the weed infestation in the orchard is essential to enable one to select the most effective herbicide or combination of herbicides. Wisely selected and properly applied they could significantly improve the control of unwanted vegetation in fig orchards. Before they are used, however, orchardists must await their registration by the EPA and their labeling for use in California.

Strip nontillage management, shown on the left, can reduce the need for cross tillage, eliminate the need for hand hoeing and working close to the trees with heavy tillage equipment.



Working close to the trees with heavy tillage tools can cause injury to the trunk and low hanging branches as pictured on the right.



Strip nontillage can facilitate the preparation of the orchard floor for harvest. The soil adjacent to the trees were not tilled.



SUSCEPTIBILITY OF ANNUAL WEEDS TO SELECTED HERBICIDES EVALUATED IN FIG ORCHARDS

 **CONTROLLED**
 **POORLY OR ERRATICALLY CONTROLLED**
 **NOT CONTROLLED**

POORLY OR IRREGULARLY CONTROLLED NOT CONTROLLED	PREPLANT		ESTABLISHED						
	Treflan®	Casoron®	Devrinol®	Goal®	Ronstar®	Rydex®	Surflan®	Paraquat®	
BROADLEAF WEEDS									
CHEESEWEED									
CHICKWEED									
COCKLEBUR									
CUDWEED									
CLOVERS									
FIDDLENECK									
FILAREE									
FLAX-LEAVED FLEABANE									
GOOSEFOOT									
GROUNDCHERRY									
GROUNDSEL									
HENBIT									
KNOTWEED									
LAMBSQUARTER									
LONDON ROCKET									
MARE'S TAIL									
MINERS LETTUCE									
MUSTARD									
NETTLE									
NIGHTSHADE									
PIGWEEED									
PINEAPPLE WEED									
POPCORN FLOWER									
PRICKLY LETTUCE									
PUNCTURE VINE									
PURSLANE									
RED MAIDS									
RUSSIAN THISTLE									
SHEPHERD'S PURSE									
SOW THISTLE									
SPURGE									
SPEEDWELL									
WILD RADISH									
GRASSY WEEDS									
ANNUAL BLUEGRASS									
BARNEYARDGRASS									
BROMEGRASSES									
CANARYGRASS									
CRABGRASS									
FESCUES									
FOXTAIL (BRISTLEGRASS)									
LOVEGRASS									
RABBITFOOTGRASS									
RYEGRASS									
SANDBUR									
WILD BARLEY (FOXTAIL)									
WILD OATS									
WITCHGRASS									

* This chart is tentative, based on experiments conducted in the Central San Joaquin Valley. Proper timing and accurate application is imperative.

Table 1 Fig Weed Control Trial
C-54, 425, 138 & 140, 10, 77-1

Trial Location: S&J Ranch, 1/8 Mi N of Nursery
Soil Type: San Joaquin Loam
Plot Size: 12'x13' - 3 reps
Evaluated: 7 May '77, 21 Sep '77

Trees Planted: 1976
Herbicides Applied: 14 March 1977
Irrigation Method: Sprinkler

		Weed Control and Injury Evaluations ^{1/}				
		7 May 1977		21 Sep 1977		Injury Rating
Herbicides	lb ai/A	Weed Control	Weeds ^{2/} Present	Weed Control	Weeds ^{2/} Present	
A Devrinol	4.0	8.3	MX	9.0	FMX	0
Goal	2.0					
B Surflan	4.0	8.3	DX	10	---	0
Goal	2.0					
C Rydex	4.0	8.0	DMX	9.3	MX	0
Goal	2.0					
D Rydex	8.0	4.0	DFMSX	9.3	D	0
E Rydex	4.0	4.0	DFSX	9.0	D	0
Ronstar	2.0					
F Goal	4.0	8.7	MX	9.3	DEM	0
G Devrinol	4.0	6.0	DFMTX	7.6	EMPX	0
Ronstar	2.0					
H Surflan	4.0	7.0	DFMX	9.0	MD	0
Ronstar	2.0					
J Untreated	---	0	DFGMPSTX	0	DEFGMPSTX	0

Remarks: Following the evaluations the established weeds were treated with Roundup at 2.0 lb ai/A.

^{1/} Weed Control and injury ratings are based on a 0 to 10 scale; 0=no weed control or no injury, 10=perfect weed control or very severe injury.

^{2/} Weeds present: D=cudweed P=pigweed
E=spotted spurge S=sowthistle
F=filaree T=smooth catsear
G=grasses X=flaxleaved fleabane
M=mare's tail

Table 2 Fig Weed Control Trial
C-54, 425, 138, 10, 76-3

Trial Location: S&J Ranch - W. of shop area
Soil Type: San Joaquin Loam
Plot Size: 10'x30' - 3 reps
Evaluated: 30 May & 21 July 1977

Herbicides Applied: 11 Feb 1976
17 Nov 1976
Irrigation Method: Drip

Herbicide		lb ai/A	Weed Control and Injury Evaluations ^{1/}				
			30 May 1977		21 July 1977		Fig Injury
			Weed Control	Weeds <u>2/</u> Present	Wetted ^{3/} Area	Weeds <u>2/</u> Present	
A	Goal	2.0	6.0	EGMV	3.0	EGMPVW	0
B	Goal	4.0	9.0	EV	7.0	EGV	0
C	Goal	8.0	10	---	9.3	EM	0
D	FMC-25213	4.0	5	EGPTV	0	ABGMPSVW	0
E	Surflan	4.0	10	----	8.0	EGPV	0
	Goal	1.0					
F	Surflan	4.0	10	----	8.0	GV	0
	Goal	2.0					
G	Devrinol	4.0	10	----	7.3	EGPV	0
	Goal	1.0					
H	Devrinol	4.0	10	----	7.0	EGP	0
	Goal	2.0					
J	Devrinol	4.0	10	----	6.7	EGPVW	0
	Ronstar	2.0					
K	Surflan	4.0	10	----	7.6	EGPV	0
	Ronstar	2.0					
L	Rydex	2.0	9	EV	6.0	EGMPVW	0
	Goal	2.0					
M	Rydex	4.0	10	----	8.3	MVW	0
	Goal	1.0					
N	Ronstar	4.0	8	CMV	2.0	ABCGMPSVW	0
P	Surflan	8.0	10	----	9.0	VW	0
Q	Devrinol	8.0	9.0	B	8.7	BEV	0
R	Rydex	8.0	10	----	9.0	VW	0
S	Untreated	---	0	ABEFGMVW	0	BEFGMPSVW	0

^{1/} Ratings and injury evaluations based on a 0 to 10 scale; 0=no weed control or injury
10=perfect weed control or very severe injury.

^{2/} Weeds Present: A=filaree E=spotted spurge M=mare's tail V=vinegar weed
B=popcorn flower F=fiddleneck P=pigweed W=wild radish
C=chickweed G=grasses S=sowthistle

^{3/} July 21 only the area wetted by the emitters were evaluated. Outside the wetted areas the plots were free of weeds.

Following each evaluation the weeds were controlled with foliar applied herbicides.

Table 3 Fig Weed Control Trial
C-54, 425, 138, 10, 76-3

Trial Location: S&J Ranch-West of shop area
Soil Type: San Joaquin Loam
Herbicides Applied: 11 Feb 1976

Plot Size: 10'x30' - 4 reps
Irrigation Method: Drip
Evaluated: 24 Apr and 21 Sep 1976

Herbicide	ai/A	Weed Control and Injury Evaluations ^{1/}				
		24 April 1976		21 Sept 1976		
		Weed Control	Weeds ^{2/} Present	Wetted ^{3/} Area	Weeds ^{2/} Present	Fig Injury
A Goal	2.0	6.0	BFG	2.0	BEFGPST	0
B Goal	4.0	9.0	B	5.3	BEGPT	0
C Goal	8.0	10	--	8.0	EG	0
D FMC 25213	4.0	10	--	5.3	EFPGST	0
E FMC 25213	8.0	10	--	7.3	EFGT	0
F Rydex	4.0	9.0	AIR	4.3	AEGPST	0
G Surflan	4.0	10	--	7.0	EGPRT	0
Goal	1.0					
H Surflan	4.0	9.0	B	7.3	EGPST	0
Goal	2.0					
J Devrinol	4.0	9.0	BR	6.0	BEGPT	0
Goal	1.0					
K Devrinol	4.0	9.0	B	7.0	BEGPT	0
Goal	2.0					
L Devrinol	4.0	9.0	B	6.0	EGPT	0
Ronstar	2.0					
M Surflan	4.0	9.0	BR	6.3	EGIPST	0
Ronstar	2.0					
N Rydex	2.0	10	--	7.0	EGPST	0
Goal	2.0					
P Rydex	4.0	10	--	7.0	EGSRT	0
Goal	1.0					
R Ronstar	4.0	8.0	C	2.0	ACEGIPST	0
S Surflan	8.0	9.0	A	9.0	GPRT	0
T Devrinol	8.0	9.0	B	8.0	PRT	0
U Untreated	---	0	ABFGIR	0	BEGFIPRST	0

Remarks: Following evaluations the weeds were sprayed with Roundup at 2.0 lb ai/A in all plots.

- ^{1/} Evaluations based on a 0 to 10 scale; 0=no control or no injury, 10=perfect control or very severe injury.
^{2/} Weeds present: A=filaree, B=popcorn flower, C=chickweed, E=spurge, F=fiddleneck, G=grasses I=cheeseweed, P=pigweed, R=wild radish, S=sowthistle, T=puncture vine.
^{3/} Evaluations made only in the area wetted by the emitters. Outside of the wetted areas the plots were free of weeds except the untreated plots.

Table 4 Fig Weed Control Trial
C-54, 425, 138, 10, 76-4

Trial Location: S&J Ranch, Field 7-11
Soil Type: San Joaquin Sandy Loam
Trees Planted: 3 March 1976
Evaluated: 19 June, 10 Aug 1976

Herbicides Applied: 18 March 1976
Plot Size: 10'x13' - 3 reps
Irrigation Method: Basin flood

Herbicide		lb ai/A	Weed Control and Injury Evaluations ^{1/}					
			19 June 1976		10 Aug 1976		Fig Injury	
			Weed Control	Weeds <u>2/</u> Present	Weed Control	Weeds <u>2/</u> Present		
A	Devrinol	4.0	>	9.6	E	9.8	C	0
	Goal	1.0						
B	Surflan	4.0	>	10	-	9.8	C	0
	Goal	1.0						
C	Rydex	4.0	>	10	-	10	-	0
	Goal	1.0						
D	Devrinol	4.0	>	10	-	9.5	CFTS	0
	Ronstar EL	2.0						
E	Goal	4.0		9.6	EL	9.8	C	0
F	Surflan	4.0	>	10	-	10	-	0
	Ronstar EC	2.0						
G	H-26905	8.0		8.6	EFP	8.3	CPFV	0
H	FMC-25213	4.0		7.6	AFGPSVX	6.0	FLPSV	0
J	Untreated	---		0	ACDEFGGPSVX	0	CFGGPSVX	0

Table 5 Fig Weed Control Trial Evaluation
C-54, 425, 138, 10, 76-1

Trial Location: Field 18-1, S&J Ranch
Soil Type: San Joaquin Loam
Established: 5 Nov 1975

Plot Size: 54'x10' - 4 reps
Irrigation Method: Basin flood
Evaluation date: 26 Apr 1976, 17 Aug 76

Herbicide	lb ai./A	Weed Control and Injury Evaluations ^{1/}		
		26 April 1976		17 Aug 76
		Weed Control	Weeds Present ^{2/}	Injury Rating
A Devrinol	4.0	7.7	FMOPW	0
B Surflan	4.0	8.7	AJPS	0
C Rydex	2.0	3.2	AEFJPS	0
D Rydex	4.0	4.7	AFJOPS	0
E Ronstar	4.0	4.7	CFP	0
F Goal	1.0	7.5	CMP	0
G Goal	2.0	8.5	CMP	0
H Goal	4.0	9.2	CP	0
J Devrinol	4.0	8.5	BCMP	0
Ronstar	2.0			
K Surflan	4.0	8.5	APS	0
Ronstar	2.0			
L Devrinol	4.0	8.7	FHPS	0
Goal	1.0			
M Rydex	2.0	5.7	HP	0
Ronstar	2.0			
N Untreated	---	0.5	ACDEFGHKLMPSW	0

Remarks: ^{1/} Evaluations based on a 0 to 10 scale.

^{2/} Weeds present:

A=filaree	J=common groundsel
B=popcorn flower	K=grass polly
C=chickweed	L=grasses
D=bromegrass	M=mare's tail
E=clover	O=owl's clover
F=fiddleneck	P=pineapple weed
G=smooth catsear	S=shepherds purse
H=willow herb	W=sowthistle

Table 6 Fig Weed Control Trial
CW23, A-36, H-27, 10, 75-3

Trial Location: Field 7-1, S&J Ranch
Soil Type: San Joaquin Sandy Loam
Plot Size: 30'x10' - 4 reps

Established: 2 Jan 1975
Irrigation Method: Furrow
Evaluated: 3/1/75

Herbicide	lb ai/A	Weed Control Evaluation	
		Weed Control ^{1/}	Weeds Present ^{2/}
A Devrinol	4.0	6.5	BPRW
B Devrinol	8.0	6.5	BPRW
C Surflan	4.0	7.7	ABW
D Surflan	8.0	8.0	ABW
E Rydex	2.0	7.0	AFOPW
F Rydex	4.0	7.2	FOPW
G Rydex	8.0	6.5	FPW
H Devrinol	4.0	8.0	ABFR
Kerb	2.0		
J Surflan	4.0	8.0	AF
Kerb	2.0		
K Ronstar	4.0	8.7	CR
L Devrinol	4.0	9.7	R
Ronstar	4.0		
M Untreated	---	0	ABCFOPRW

1/ Weed control rating based on a scale of 0 to 10.
0 = perfect control
10 = no control

2/ Weeds present:

A=filaree

B=burclover

C=chickweed

F=fiddleneck

O=owl's clover

P=popcorn flower

R=red maids

W=wild radish

Table 7 Fig Weed Control Trial Evaluations
CW-23, A-36, H-27, 10, 75-5

Location: Polk Ave 1/8 mi South of Dakota
Jura Farms
Soil Type: San Joaquin Loam
Plot Size: 7'x54'

Established: 18 Feb 1975
Irrigation: Basin Flood
Evaluated: 24 Jun '75

Herbicides	lb ai/A	Annual Weed Control Evaluations	
		Average ^{1/} Weed Control	Weeds Present ^{2/}
A Devrinol	4.0	7.6	AFM
B Devrinol	8.0	8.0	AFHMS
C Surflan	4.0	6.7	ABDEKSC
D Surflan	8.0	8.0	ABEFGHMPS
E Rydex	3.0	8.7	AFM
F Rydex	6.0	8.7	AFM
G Devrinol Kerb	4.0 2.0 >	7.2	AFMS
H Surflan Kerb	4.0 2.0 >	8.5	ABEFJKPS
J Surflan Ronstar	4.0 4.0 >	8.2	AFHJMS
K Devrinol Ronstar	4.0 4.0 >	8.2	AFJLMS
L Untreated	---	3.0	AFMS

Remarks: ^{1/} Evaluations based on a 0 to 10 scale. 0 = no control
10 = perfect control

^{2/} Weeds Present:

A = filaree	G=chickweed	P=purslane
B = barnyardgrass	H=willow herb	S=sowthistle
C = puncturevine	J=black nightshade	
D = shepherds purse	K=crabgrass	
E = pigweed	L=bermudagrass	
F = flaxleaved fleabane	M=mare's tail	

Table 8 Fig Tree -- Herbicide Screening Trial
A36, 73,501, H-14, 75-1

Trial Location: KHFS
Soil Type: Hanford Sandy Loam
Trees Planted: 13 Mar 75
Herbicides Applied: 27 Mar 75

Plot Size: 10'x20' - 3 reps
Irrigation Method: Sprinkler
Evaluated: 25 Jun 75

Herbicides Applied: 27 Mar 75					Fig Tree Injury and Weed Control Evaluation 1/				
Herbicides	lb ai/A	Injury 2/ Rating Fig	Broadleaf Control 5/10/75	Grass 3/ Control 6/25/75	Herbicides	lb ai/A	Injury 2/ Rating Fig	Broadleaf Control 5/10/75	Grass 3/ Control 6/25/75
Princep	2	5.3	10	9.0	VCS 5052	2	1.0	6.7	3.3
Roundup	4	1.7	10	9.7	VCS 5052	8	1.3	9.0	4.3
Princep	1				VCS 4207	2	4.3	7.3	4.3
Devrinol	4				VCS 4207	8	6.0	10.0	4.0
Roundup	4	3.3	10	10.0	HER-26905	4	0.0	9.7	9.0
Princep	1				HER-26905	16	0.7	10.0	9.3
Surflan	4								
Goal	2	0.0	10	9.7	Prowl	4	0.0	10.0	9.7
Goal	8	0.0	10	10.0	Prowl	16	0.0	10.0	9.7
FMC 25213	4	0.0	10	6.3	Gulf-21634	4	1.7	4.0	3.0
FMC 25213	16	3.3	10	7.3	Gulf-21634	16	7.0	0	7.0
R 20810	4	0.0	10	8.7	Krenite	8	0.7	7.7	4.7
R 20810	16	0.0	10	10.0	Krenite	32	5.0	1.7	7.0
R 20630	4	0.0	10	10.0	R-3787	2	0.7	8.3	4.0
R 20630	16	0.0	10	10.0	R-3787	8	4.0	9.7	5.3
SN 45311	2	3.0	10	8.0	R-31401	2	3.3	10.0	8.3
SN 45311	8	8.3	9.7	8.3	R-31401	8	8.0	10.0	9.3
SN 52808	2	4.0	10	5.3	U-44078	2	3.0	9.3	6.3
SN 52808	8	8.3	10	9.3	U-44078	8	0.7	10.0	8.7
SN 49962	2	1.0	9.0	3.0	MBR 16302	2	2.3	9.0	2.0
SN 49962	8	5.0	10	7.0	MBR 16302	8	4.3	9.7	3.3
					MBR 15802	2	1.0	8.3	2.7
Untreated	-	1.7	2.6	4.7	MBR 15802	8	6.0	10.0	1.7

Remarks: ^{1/} Injury and weed control rating based on a 0 to 10 scale, 0=no control, or no injury.
10=perfect weed control or severe injury.

^{2/} Broadleaf weeds were primarily Fiddleneck

^{3/} Grasses primarily crabgrass and cupgrass.

Table 9 FIG WEED CONTROL TRIAL
CW 23, A 36, H 27, 10, Fg - 1-73

Soil Type:	San Joaquin Sandy Loam	Variety:	Calimyrna
Established:	21 November 1972	Irrigation Method:	Sprinkler
Retreated:	5 December 1973	Evaluated:	19 April 1974
Plot Size:	30' x 10' - 4 replications		

Herbicide	lb ai/A	Weed Control Rating ^{1/}	Weeds Present ^{2/}
A Devrinol	4.0	5.7	MPR
B Devrinol	8.0	8.7	PR
C Devrinol	2.0	6.7	AFMNPR
Casoron	2.0		
D Devrinol	4.0	7.7	GMPR
Casoron	4.0		
E Casoron	4.0	0.7	DFGHMRT
F Casoron	8.0	3.5	FMRST
G Planavin	2.0	5.0	FHMTW
Casoron	2.0		
H Planavin	4.0	5.7	BFHLR
Casoron	4.0		
J Surflan	2.0	5.5	FNRT
Casoron	2.0		
K Ronstar	4.0	8.0	CMPRS
L Ronstar	8.0	8.5	CST
M Ronstar	2.0	8.7	FMR
Planavin	2.0		
N Untreated	---	0	ACEGMPRSVW

Remarks:

- Weed Control Rating based on a scale of 0-10.
0 = no control
10 = perfect control

2. Weeds Present:

A - Fiddleneck	E - Redmaids	L - Clovers	R - Wild Radish
B - Mustard	F - Filaree	M - Mare's Tail	S - Sandspurry
C - Chickweed	G - Groundcherry	N - Nightshade	T - Sowthistle
D - Cudweed	H - Willow Herb	P - Popcorn	V - Veronica
		Flower	W - Foxtail Fescue

Table 10 FIG WEED CONTROL TRIAL
CW 23, A 36, H 27, 10, Fg -1-73

Trial Location: Field N. W. corner S & J Ranch
Soil Type: San Joaquin sandy loam
Established: November 21, 1972
Plot Size: 30' x 10' - 4 replications

Variety: Calimyrna
Irrigation Method: Sprinkler
Evaluated: March 16, 1973

		WEED CONTROL EVALUATIONS ¹									
Herbicide	lb. ai/A	Overall	Fiddle- Shepherd's		neck	Purse	Vetch	Grasses	Popcorn Flower	Chick- weed	Willow Herb
		W/C	Radish	Filaree							
A Devrinol	4.0	9.1	9.3	10.0	9.6	9.6	9.6	9.6	9.0	10.0	10.0
B Devrinol	8.0	9.2	9.0	10.0	10.0	9.2	9.7	10.0	9.5	10.0	10.0
C Devrinol	2.0	>	8.7	9.0	9.7	8.7	9.2	9.7	9.0	9.5	10.0
Casoron	2.0										
D Devrinol	4.0	>	9.6	9.5	9.5	10.0	9.7	10.0	10.0	10.0	10.0
Casoron	4.0										
E Casoron	4.0	8.2	7.7	6.7	9.5	9.7	8.2	9.2	10.0	10.0	10.0
F Casoron	8.0	9.1	9.5	9.0	10.0	9.2	8.5	9.7	9.7	10.0	10.0
G Planavin	2.0	>	6.7	6.2	7.0	10.0	8.7	1.7	6.7	10.0	10.0
Casoron	2.0										
H Planavin	4.0	>	8.5	9.2	9.2	10.0	10.0	7.7	8.7	10.0	10.0
Casoron	4.0										
J Surflan	2.0	>	7.7	8.0	6.7	10.0	9.5	7.5	8.5	10.0	10.0
Casoron	2.0										
K Ronstar	4.0	9.5	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.0	10.0
L Ronstar	8.0	9.6	10.0	10.0	10.0	10.0	10.0	10.0	10.0	9.0	10.0
M Ronstar	2.0	>	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Planavin	2.0										
N Untreated	---	0	0	0	0	0	0	0	0	0	0

REMARKS: Herbicides applied in 2700 cc per plot with a CO₂ sprayer.

Paraquat at 0.5 lb. ai/A was added to all treatments to control the emerged seedling weeds.

¹ Weed control evaluations are based on a scale of 0-10. 0= no weed control; 10 = perfect weed control.

Table 11 FIG - WEED CONTROL TRIAL

Fr. Fig 68-2

Trial Location: S & J Ranch - Avenue 10
 Established: 14 March 1968
 Retreated: 9 January 1969
 Soil Type: Hanford Sandy Loam

Plot Size: 2' x 10' - 3 replications
 Variety: Calimyrna - planted as
 cutting - Spring 1966

WEED CONTROL & INJURY EVALUATIONS ¹											
Herbicides		Lb ai/A	27 June 1968			20 May 1969			5 Aug 1969		
			Weed Control	Injury	Weeds Present	Weed Control	Injury	Weeds Present	Weed Control	Injury	Weeds Present
A Dacthal	75 WP	8.0	9.6	0	EL	5.0	0	FSL	6.0	0	EF
B Dacthal	75 WP	16.0	9.3	0	DEL	7.6	1.0	CF	7.0	0	EF
C Planavin	75 WP	2.0	9.6	0	L	9.0	1.0	FL	8.3	0	EF
D Planavin	75 WP	4.0	9.3	0	DLV	9.0	1.6	FL	9.3	0	
E Casoron	4 G	4.0	5.6	3	CEV	5.0	1.6	DFL	6.3	1.0	F
F Casoron	4 G	16.0	7.6	1.6	CE	7.3	1.3	CDF	8.0	3.0	F
G Devrinol	50 WP	2.0	10.0	0		6.0	1.6	F	5.0	0	EF
H Devrinol	50 WP	8.0	10.0	0		8.3	0.6	EF	8.0	0	EF
J R-11913	75 WP	2.0	10.0	0		4.3	1.6	CDF	4.3	0	CFV
K R-11913	75 WP	8.0	9.3	0	CE	5.6	.6	CDFLS	4.3	0	CFV
L Kerb	75 WP	2.0	10.0	0		6.6	0	CDFLS	6.0	1.0	DF
M Kerb	75 WP	8.0	9.3	0	E	4.6	1.0	DFS	3.6	1.0	DF
N Probe	1 EC	4.0				9.0	.6	BF	9.6	1.6	CV
P Probe	1 EC	16.0				9.6	3.3	B	9.6	3.3	V
Q Untreated	----	0	0	0	CDELV	0	0	CDFLRS	0	0	CDFV

Remarks: Weeds Present

C = Crabgrass

F = Fleabane

S = Sowthistle

D = Cudweed

L = Clover

V = Lovegrass

E = Mare's Tail

R = Filaree

¹ Weed control and injury ratings are based on a rating of 0-10. 0 = no weed control or no injury; 10 = perfect weed control or severe injury.

WEED INFESTATION RECORD

FIELD LOCATION _____ CROP _____ HERBICIDE USED _____
 DATE PLANTED _____ DATE NOTES TAKEN _____ PREVIOUS CROP _____

BROADLEAF ANNUALS	Anise	Atriplex	Bassia Five Hook	Black Bindweed	Bristly Oxtongue	Burweed	Carpetweed	Cat's Ear	Cheeseweed
Chickweed	Clover	Cocklebur	Corn Spurry	Cudweed	Dandelion	Dock	Dodder	Fat Hen	Fiddleneck
Filaree	Flaxleaved Fleabane	Ground-cherry	Groundsel	Hemlock	Henbit	Jimson Weed	Knotweeds	Lambsquarters	Lettuce Wild
London Rocket	Mare's Tail	Mayweed	Milk Thistle	Minerslettuce	Morning Glory	Mustard	Nettle	Nettleleaf Goosefoot	Nightshade
Nuttalls Monolepis	Phacelia	Pigweed	Pineapple Weed	Plantain	Popcorn Flower	Puncture Vine	Purslane	Red Maids	Russian Thistle
Scarlet Pimpernel	Shepherd's Purse	Sow Thistle	Spiny Clotbur	Spurge	Sunflower, Common	Tarweed	Telegraph-plant	Toadflax	Turkey Mullein
Velvet Leaf	Venice Mallow	Veronica	Willow Herb	Yellow Starthistle					
GRASSES ANNUAL	Annual Bluegrass	Barley, Volunteer	Barnyard-grass	Bromegrass	Canarygrass	Crabgrass	Cupgrass	Dallisgrass	Diffuse Lovegrass
Feather Finger-grass	Foxtails (Bristle grass)	Jungle Rice	Orcutts Lovegrass	Rabbitfootgrass	Ripgut Brome	Ryegrass	Sandbur	Sprangletop	Wild Barley (Foxtails)
Wild Oats	Witchgrass								
PERENNIALS	Alkali Sida	Bermudagrass	BINDWEED (Morning Glory)	Cattail	Chickory	Heliotrope	Hoary Cress	Johnsongrass	Nutsedge, Purple
Nutsedge, Yellow	Russian Knapweed	Saltgrass	SILVERLEAF NIGHTSHADE (Horsenettle)	Swamp Smart-weed (Kelp)	Tolgoucha	Tule			

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This weed control record card properly used will enable you to use selective herbicides more economically. Fill out a card for each field three times during the growing season:

- a. soon after crop emergence;
- b. mid-season;
- c. before harvest.

To indicate the presence of a weed, use a check mark ✓ in the spaces provided.

To indicate the degree of infestation you can use a scale of 1 - 5.

- 1 = very few weeds present
- 2 = light infestation
- 3 = moderate infestation
- 4 = heavy infestation
- 5 = very heavy infestation

A good record of weed infestation will enable you to select a crop rotation system that can minimize your weed control costs and enable you to select the most effective tools whether chemical or mechanical.

Bill B. Fischer, Fresno County Farm Advisor
University of California Agricultural Extension Service

TOWARD MORE EFFECTIVE WEED CONTROL

Without knowledge of the weed infestation it isn't possible to intelligently plan an economical weed control program.

Weed infestations recorded on weed infestation cards, such as the one below, will enable you to select a crop rotation system that can minimize your weed control costs. It can enable you to select the most effective tools whether mechanical or chemical. Cards such as this are available free from farm advisors and pest control advisors.

To help you identify weeds the Growers Weed Identification Handbook with colored photographs of 151 commonly found weeds in California may be helpful. The handbook can be purchased from the Publications Division of Agricultural Sciences of the University of California. Order forms are available from Cooperative Extension offices.

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