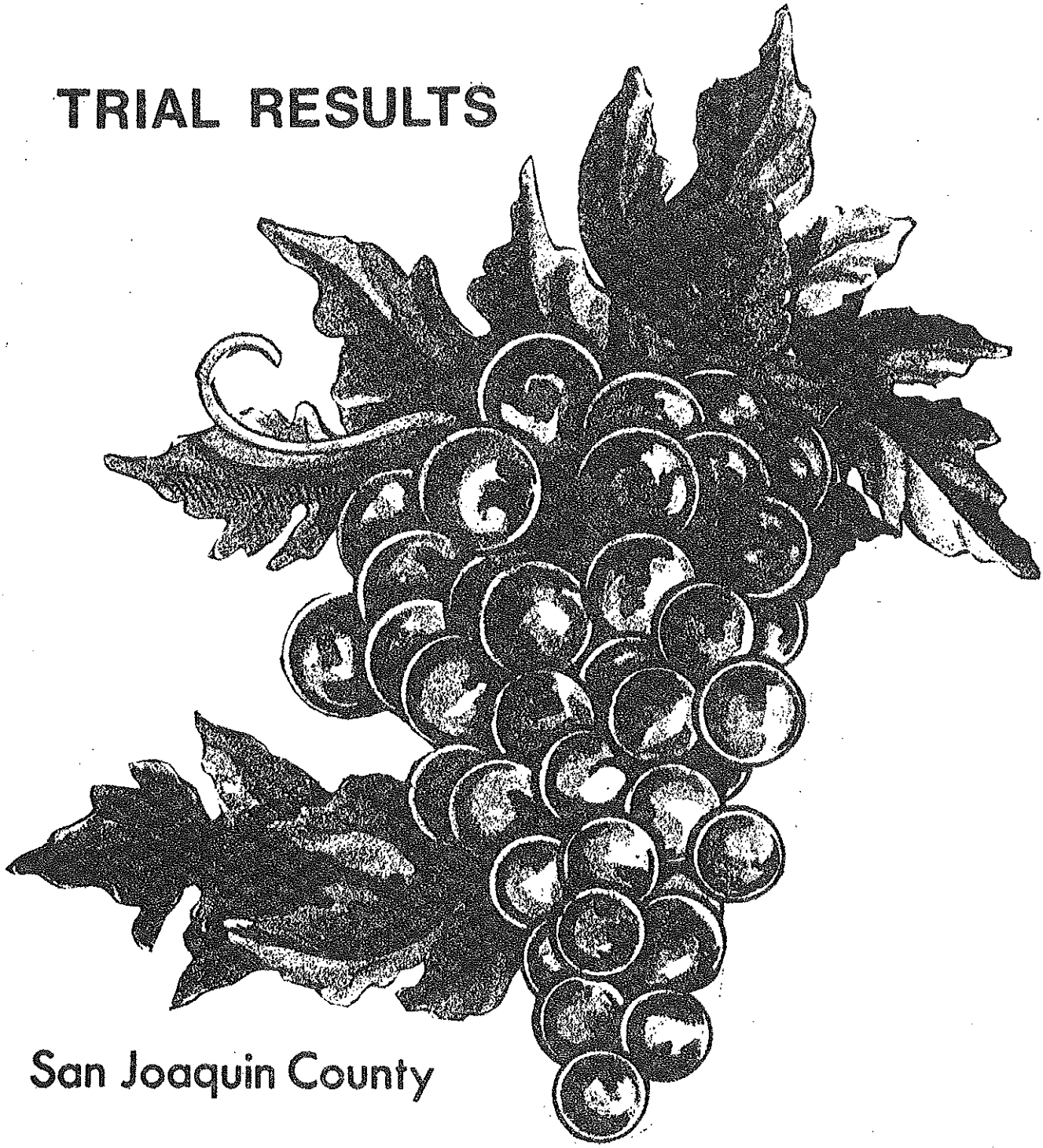
GRAPE
Weed Control

TRIAL RESULTS



San Joaquin County

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1985 GRAPE WEED CONTROL RESEARCH PROGRESS REPORT

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and

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San Joaquin County

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A C K N O W L E D G E M E N T S

The grape weed control program in San Joaquin County is conducted with the cooperation and management assistance of the following growers and farm managers: Jerry Fry and Jeff Frey; Frank Rodriquez, Steve Foiada, and Morris Ball; and Dale Carlson. It is their fine cooperation that benefits all grape growers in San Joaquin County in the area of weed control. Many thanks and appreciation are extended to them for their assistance, interest, and patience.

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C A U T I O N

This report is a summary of grape weed control studies conducted in San Joaquin County. It should not, in any way, be interpreted as a recommendation of the University of California.

Trade names of herbicides are used in this report, as well as the less familiar common names of herbicides to familiarize the reader with the various products tested. No endorsement of products mentioned or criticism of similar products is intended.

The rates of herbicides in this report are always expressed as active ingredient (a.i.) of the material per treated acre.

TRADE NAME	COMMON NAME	MANUFACTURER
Bueno	MSMA	SDS Biotech
Assure	DPX-Y6202	DuPont Chemical Co.
EPTAM	EPTC	Stauffer Chemical
Princep	simazine	Ciba-Geigy
Surflan	oryzalin	Elanco
Goal	oxyfluorfen	Rohm and Haas
Solicam	norflurazon	Sandoz Limited
Roundup	gyphoeate	Monsanto
Poast	sethoxydim	BASF
Fusilade	fluazifop	ICI Americas, Inc.
SC-1084	SC-1084	Stauffer Chemical
Racer	fluorochloridone	Stauffer Chemical
Ignite (HOE-0661)	glufosinate-ammonium	American Hoescht
Prowl	pendimethalin	American Cyanamide
Dual	metolachlor	Ciba-Geigy
Verdict	Dowco 453	Dow Chemical Co.
AC 263,499	AC 263,499	American Cyanamide
Basagran	bentazon	BASF
Kerb	pronamide	Rohm and Haas
Endurance	prodiamine	Velsicol
Harness	acetochlor	Monsanto
Igran	terbutryn	Ciba-Geigy
BAS-0517	BAS-0517	BASF

1985 GRAPE WEED CONTROL TRIAL RESULTS

During 1985, a total of five (5) weed control trials in grapes was established and evaluated in San Joaquin County.

The first trial was a pre-emergence, surface-applied, rainfall incorporated winter weed control trial in established Zinfandel grapes at Mohr-Fry Ranches (Jerry Fry and Jeff Frey) northwest of Lodi, California. Emerged weeds were treated with Roundup at 1 lb/Ac + 1/2% X-77. All treatments were at the same time as application of the pre-emergence materials.

The second trial was at Mohr-Fry Ranches (Jerry Fry and Jeff Frey) northwest of Lodi, California, in established Zinfandel grapes. This experiment was a postemergence weed trial applied to emerged weeds during the dormant season for grapes and sought to evaluate candidate contact/residual materials for control of winter weeds.

The next trial was a pre-emergence weed control trial evaluating six herbicides for possible control of yellow nutsedge at Vineyard Properties (Frank Rodriquez, Steve Foiada, and Morris Ball) southeast of Collegeville, California. The vineyard (established Carignane grapes) was free of weeds on the application date (2/7/85), and the vines were dormant. Incorporation into the soil was accomplished by a combination of winter rainfall and sprinkler irrigation.

The fourth trial was a postemergence summer-applied, dallisgrass control plot in established Petite Syrah grapes at Vineyard Properties (Frank Rodriquez, Steve Foiada, and Morris Ball) southeast of Collegeville, California. Stage of grape growth was early fruit sizing at time of first treatment (7/8/85). Low hanging canes were removed before spraying, and applications were made as directed sprays to the base of the vines but over the 6-24 inch tall dallisgrass. The second set of treatments, applied in the same manner, was made on 9/5/85.

The last grape weed control trial was a postemergence experiment for control of yellow nutsedge at San Francisco and Fresno Land Company (Dale Carlson) southeast of Linden, California. The vineyard (established Chenin Blanc) was at the late fruit set/early fruit sizing stage of growth at time of first treatment (7/8/85). The second set of treatments was made on 9/5/85. At both treatment dates, low hanging grape canes were pruned back, and the four herbicide materials were applied as directed sprays to the base or trunk of the vines but over the 8 to 14 inch tall yellow nutsedge. The vineyard was drip-irrigated throughout the season.

A Pre-emergence Weed Control Experiment in Established Zinfindel Grapes. Mullen, R. J.; J. J. Kissler, P. Verdegaal, J. Grant, A. H. Lange, and C. L. Elmore. A pre-emergence weed control trial in established grapes, evaluating six individual herbicides and seven herbicide combination treatments, was treated on January 10, 1985. The trial was located at Mohr-Fry Ranches (Jerry Fry and Jeff Frey) northwest of Lodi, California, and the soil type was a Hanford sandy loam. Treatments were surface applied and rainfall incorporated, with emerged weeds treated with Roundup (glyphosate) at 1 lb/Ac plus ½% spreader at the same time the pre-emergence materials were put out. All materials were applied with a handheld CO_2 backpack sprayer in 30 gallons per acre spray volume. Weeds present at the time of trial establishment were 4-to-8 inch tall red stem filaree, 2-to-6 inch tall sowthistle, 2-to-4 inch panicled willow herb, and some seedling-to-2 inch tall flaxleaf fleabane. The application of Roundup plus spreader was effective in removing most of the weeds emerged except larger red-stem filaree, which was only partially burned back. These observations were made nearly four weeks after treatment due to slowness of the chemical to work because of persistent cold, foggy weather. Evaluation for effectiveness and crop safety of the pre-emergence materials was made on April 9, 1985. Weeds present at the time of rating included red-stem filaree, sowthistle, panicled willow herb, and field bindweed (morningglory). Best overall weed control was achieved by the combination treatment of Goal (oxyfluorfen) and Surflan (oryzalin) followed by the combination treatment of Princep (simazine) plus Endurance (prodiamine). The combination of Princep and Solicam (norflurazon) and the combination of Princep and Kerb (pronamide) were effective on all weeds except field bindweed. The combination of Princep and Surflan and the combination of Princep and Prowl (pendimethalin) were effective on all weeds except red-stem filaree. All treatments exhibited excellent crop safety. Winter rainfall was light to moderate after trial establishment which may have led to incomplete incorporation of some of the herbicides and some reduction in their effectiveness. Goal and Princep continued to demonstrate their history of dependability as vineyard herbicides in this area.

Treatment	Rate Lb/Ac	Red Stem Filaree	Sowthistle	Panicled Willow Herb	Field Bindweed	Crop Phyto[1/]
oxyfluorfen + oryzalin	1+6	9.3	10.0	10.0	8.8	0.5
simazine + oryzalin	2+6	6.5	10.0	10.0	8.3	0.5
Oryzalin	6	6.1	9.8	5.0	7.0	0.5
fluorochloridone	3	4.3	9.8	9.5	5.3	0.5
simazine + acetochlor	2+8	7.5	10.0	10.0	5.8	0.5
norflurazon	6	6.5	8.5	3.8	5.0	0.5
simazine + norflurazon	2+4	8.6	10.0	10.0	6.3	0.5
prodiamine	6	6.5	8.5	4.8	8.5	0.5
simazine + prodiamine	2+4	7.9	10.0	9.9	8.6	0.5
pendimethalin	6	5.4	9.0	5.6	6.6	0.5
simazine + pendimethalin	2+6	6.5	10.0	10.0	8.0	0.5
pronamide	6	7.4	4.8	9.1	5.0	0.5
simazine + pronamide	2+4	8.5	9.9	10.0	6.0	0.5
control	-	3.3	3.0	1.0	2.3	0.5

[1/] Average of four replications:

0 = no weed control; no crop damage
10 = complete weed control; crop dead

A Post-emergence Weed Control Trial in Established Zinfandel Grapes. Mullen, R. J.; J. J. Kissler, J. Grant and P. Verdegaal. A post-emergence weed control trial in established Zinfandel grapes, evaluating three herbicide candidate materials, was put out at Mohr-Fry Ranches (Jerry Fry and Jeff Frey) northwest of Lodi, California, on January 10, 1985. The vineyard was dormant at time of application, and all materials were applied with a handheld CO_2 backpack sprayer. Roundup (glyphosate) plus spreader was applied in 10 gallons per acre spray volume, while Ignite (glufosinate-ammonium) and AC 263,499 plus spreader were applied in 30 gallons per acre spray volume. Weeds present at time of treatment were 2-to-3 inch tall Poa annua (annual bluegrass), 3-to-5 inch tall chickweed, 2-to-4 inch tall sowthistle, 4-to-8 inch tall, red-stem filaree, and 2-to-4 inch tall panicled willow herb. The soil type in the vineyard was a Hanford sandy loam, and climate conditions at time of herbicide treatment were cool (52°) and foggy. Ratings for weed control effectiveness, and crop safety were made 1/31/85. Best overall weed control of the weed species present was attained by the high rate of Ignite (glufosinate-ammonium) at 1¼ lb/Ac, followed by the low rate of Ignite, and then AC 263,499 plus spreader. Roundup, even at the high rate (1 lb/Ac a.i.) plus spreader, was somewhat weak, particularly on red-stem filaree and panicled willow herb. All treatments were quite safe to the crop. As late as April 9, 1985, both treatments of Ignite still were giving good weed control, with only a little panicled willow herb, flaxleaf fleabane, and perennial field bindweed (morningglory) showing. AC 263,499 looked very good as well with a little prickly lettuce, flaxleaf fleabane, and panicled willow herb present. All treatments still showed excellent crop safety as of the April 9, 1985, date.

Treatment	Rate Lb/Ac	Panicled Willow Herb	Chickweed	Poa Annua	Red Stem Filaree	Sowthistle	Crop Phyto[1/]
glyphosate + X-77	1/4 + 1/2%	3.5	7.0	6.5	3.0	7.5	0.5
glyphosate + X-77	1/2 + 1/2%	5.7	8.0	7.0	4.5	8.3	0.5
glyphosate + X-77	1 + 1/2%	7.1	8.5	7.5	6.8	8.8	0.5
AC 263,499 + X-77	1/4 + 1/4%	8.0	9.0	8.8	8.5	9.1	0.5
glufosinate-ammonium	3/4	8.5	9.0	9.0	9.3	9.5	0.5
glufosinate-ammonium	1-1/4	9.0	9.6	9.1	9.5	9.8	0.5
control	-	0.0	0.0	0.0	0.0	0.0	0.5

[1/] Average of four replications: 0 = no weed control; no crop damage
10 = complete weed control; crop dead

A Pre-emergence Yellow Nutsedge Weed Control Trial in Established Carignane Grapes. Mullen, R. J.; J. J. Kissler, C. L. Elmore, A. H. Lange, and P. Verdegaal. A pre-emergence weed control trial, evaluating four individual herbicides and one herbicide combination treatment for effectiveness on yellow nutsedge, was established at Vineyard Properties southeast of Collegeville, California, on February 7, 1985. The vineyard (established Carignane grapes) was weed-free and dormant at the time of herbicide application. The soil type was a Landlow adobe clay, and the vineyard was sprinkler irrigated throughout the season. All treatments were applied in 50 gallons per acre spray volume with a handheld CO_2 backpack sprayer. Soil incorporation of the materials was accomplished by a combination of rainfall and sprinkler irrigation. Application was made in late afternoon on a cool (45°), clear day. Ratings for weed control effectiveness and crop safety were made on April 8, 1985, and again on May 28, 1985. Best overall control of yellow nutsedge occurred with the high rate of Harness (acetochlor) followed by the high rate of Dual (metolachlor), but at the second rating date both of these treatments were declining in level of control/suppression. The lower rates of Harness and Dual, as well as the high rate of Solicam (norflurazon) gave good initial levels of yellow nutsedge control/suppression, but dropped considerably by the second rating in late May. The combination of Igran (terbutryn) plus Eptam (EPTC) and Racer (fluorochloridone) alone were generally weak on yellow nutsedge, as was the low rate of Solicam. Crop safety was excellent with all materials at both rating dates.

Treatment	Rate Lb/Ac	Weed Control[1/] Yellow Nutsedge 4/8/85	5/28/85	Crop Phyto[1/] 4/8/85	5/28/85
metolachlor	2	9.1	6.5	0.5	0.5
metolachlor	4	9.2	7.2	0.5	0.5
acetochlor	2	8.3	6.7	0.5	0.5
acetochlor	4	8.2	7.4	0.6	0.5
terbutryn + EPTC	4+4	6.3	5.0	0.5	0.5
norflurazon	2	4.4	4.0	0.6	0.5
norflurazon	4	7.9	6.0	0.5	0.5
fluorochloridone	4	5.9	5.3	0.7	0.5
Control	---	2.0	1.0	0.6	0.5

[1/] Average of four replications: 0 = no weed control; no crop damage
10 = complete weed control; crop dead

A Post-emergence Weed Control Trial in Established Petite Syrah Grapes. Mullen, R. J., P. Verdegaal, J. J. Kissler, A. H. Lange. A post-emergence weed control trial in established Petite Syrah grapes, evaluating eight individual herbicides with spreader or crop oil concentrate added to the spray mixture, was put out at Vineyard Properties (Frank Rodriquez, Steve Foiada, and Morris Ball) southeast of Collegeville, California, on July 8, 1985. Second applications of all materials were made on September 5, 1985. The target weed was 6-24 inch tall dallisgrass at the time of initial treatment. Soil type in the vineyard was a Landlow adobe clay, and all treatments were applied in 50 gallons per acre spray volume with a handheld CO_2 backpack sprayer. At each treatment date, low hanging grape canes were pruned back, and the materials were applied as directed sprays to the base of the grape vines but over the top of the dallisgrass. Climatic conditions on the first spray date were clear and hot (100°F), and on the second application date, it was clear and warm (88°). Weed control (topkill) and crop safety ratings were made on August 2, 1985, and again on October 1, 1985. Best topkill from the first application of materials occurred with Ignite (glufosinate-ammonium) plus 1/2% spreader, followed by Assure (DPX-Y6202) plus crop oil concentrate. Some lower leaf burn of the grapes (mostly suckers) occurred with Ignite. At the second rating date and after both application dates, best top kill of dallisgrass occurred with Roundup (glyphosate) plus 1/2% spreader, followed closely by Ignite plus spreader and Fusilade (fluazifop) plus crop oil concentrate. All of the remaining materials tested also gave good levels of top kill. All treatments showed good crop safety with only Ignite showing some slight leaf burn on suckers.

Treatment	Rate Lb/Ac	Weed Control[1/] Dallisgrass* (Topkill) 8/2/85	10/1/85	Crop[1/] Phyto 8/2/85	10/1/85
sethoxydim + COC	0.4 + 0.4 + (1/2%)	6.0	8.4	0.5	0.5
BAS-0517 + COC	0.2 + 0.2 + (1/2%)	6.5	8.5	0.5	0.5
fluazifop + COC	0.4 + 0.4 + (1/2%)	6.1	9.0	0.5	0.5
Dowco 453 + COC	0.4 + 0.4 + (1/2%)	6.5	8.3	0.7	0.5
DPX-Y6202 + COC	0.4 + 0.4 + (1/2%)	7.2	8.0	0.5	0.5
glyphosate + X-77	2 + 2 + (1/2%)	7.0	9.4	0.8	0.5
glufosinate-ammonium + X-77	1.5 + 1.5 + (1/2%)	9.5	9.0	1.8	1.0
SC-1084 + COC	0.5 + 0.5 + (1/2%)	5.5	8.4	0.5	0.5
control	-	0.0	1.8	0.4	0.5

[1/] Average of four replications:

0 = no weed control; no crop damage

10 = complete weed control; crop dead

*Dallisgrass ranged in size at time of treatment from 6 inches tall (seedling) to 24 inches tall (established). Grape crop was beginning to size its fruit.

A Postemergence Yellow Nutsedge Control Trial in Established Chenin Blanc Grapes. Mullen, R. J.; P. Verdegaal, and J. J. Kissler. A postemergence weed control trial evaluating four individual herbicides with spreader or crop oil concentrate added to the spray mixture, was put out at San Francisco and Fresno Land Company (Dale Carlson) southeast of Linden, California, on July 8, 1985. A second set of treatments of all materials was applied on September 5, 1985. The target weed was 8 to 14 inch yellow nutsedge at the time of initial treatment. Soil type in the drip-irrigated vineyard was a Wyman clay loam, and all treatments were applied in 50 gallons per acre spray volume with a handheld CO_2 backpack sprayer. At each treatment date, low hanging grape canes were pruned back, and the materials were applied as directed sprays to the base of the grape vines but over the top of the yellow nutsedge. Climatic conditions on the first spray date were clear and hot (100°F+), while on the second application date, it was clear and warm (85°F). Weed control (topkill) and crop safety ratings were made on August 2, 1985, and again on October 1, 1985. Best topkill from the first application of materials was attained by Ignite (glufosinate-ammonium) plus spreader, followed by Roundup (glyphosate) plus spreader and then Bueno (MSMA) plus crop oil concentrate. At the second rating date, and after both treatment dates, the best topkill of yellow nutsedge occurred with Bueno plus crop oil concentrate, followed closely by the remaining treatments: Roundup plus spreader, Ignite plus spreader, and Basagran (bentazon) plus crop oil concentrate. Part of the increased topkill may have been due to water stress since the grower had ceased his drip irrigation about 3 to 4 weeks earlier in preparation for harvest (note the level of topkill in the untreated control at the second rating date). Roundup plus spreader and Ignite plus spreader gave some lower leaf burn at the first rating date on the grapes, primarily suckers, but by the second rating date all treatments were excellent in terms of crop safety.

Treatment	Rate Lb/Ac	Weed Control[1/] Yellow Nutsedge* (Topkill) 8/2/85	10/1/85	Crop[1/] Phyto 8/2/85	10/1/85
glyphosate + X-77	2+2+(½%)	7.5	9.7	2.3	0.7
bentazon + COC	2+2+(½%)	7.0	9.7	0.7	0.5
MSMA + COC	4+4+(½%)	7.3	9.9	0.5	0.5
glufosinate-ammonium + X-77	2+2+(½%)	9.0	9.7	1.1	0.5
Control	---	0.0	4.3	0.4	0.5

[1/] Average of four replications: 0 = no weed control; no crop damage
10 = complete weed control; crop dead

*Yellow nutsedge was 8" to 14" tall at time of initial treatment. Grape crop was at late fruit set/early fruit sizing stage of growth.

REGISTRATION STATUS OF HERBICIDES EVALUATED IN DECIDUOUS FRUIT ORCHARDS AND VINEYARDS

The registration status of the following herbicides were compiled from the Environmental Protection Agency Compendium of Agricultural Pesticides, Vol. 1, and from the California State Department of Agriculture.

Changes in the registration status of herbicides may occur at any time. Therefore, always read and follow the directions printed on the label. **This is not a recommendation for the use of herbicides in orchards and vineyards.** Most orchards and vineyards are infested with a broad spectrum of weeds. To control them effectively, combinations and/or sequential applications of herbicides are required. The attached susceptibility charts may serve as a guide.

Soil Applied -- Preemergence To The Weeds.

	Almond	Apple	Apricot	Fig	Grape	Peach	Nectarine	Pear	Pistachio	Plum	Prune	Walnut
CASORON® dichlobemil	R	R	–	–	R	R	R	R	–	R	–	R
DEVRINOL® napropamide	R	R	R	R	R	R	R	R	R	R	R	R
ENIDE® diphenamid	–	R	–	–	–	–	–	–	–	–	–	–
EPTAM® EPTC	R	–	–	–	–	–	–	–	–	–	–	R
GOAL® oxyfluorfen	R	–	R	R	R	R	R	R	R	R	R	R
KARMEX® diuron	–	R	–	–	R	R	–	R	–	–	–	R
PREMERGE® SINOX PE® dinoseb	R	R	R	R	R	R	R	R	–	R	R	R
PRINCEP® simazine	R	R	–	–	R	R	–	R	–	R*	–	R
PROWL® pendimethalin	NB	NB	NB	–	NB	NB	NB	NB	NB	NB	NB	NB
SINBAR® terbacil	–	R	–	–	–	R	–	–	–	–	–	–
SOLICAM® norflurazon	R	R	R	–	R	R	R	R	–	R	R	R
SURFLAN® oryzalin	R	R	R	R	R	R	R	R	R	R	R	R
TREFLAN® trifluralin	R	–	R	–	R	R	R	–	–	R	R	R

Foliar Applied - On Growing Weeds

Translocated Herbicides	Almond	Apple	Apricot	Fig	Grape	Peach	Nectarine	Pear	Pistachio	Plum	Prune	Walnut
DOWPON® dalapon	R	R	R	–	R	R	–	R	–	R	R	–
FUSILADE® fluazifop	NB	NB	NB	–	NB	NB	NB	NB	NB	NB	NB	NB
MSMA[1/]	NB	NB	NB	–	NB	NB	–	NB	–	NB	NB	NB
POAST® sethoxydim	NB	NB	NB	–	NB	NB	NB	NB	NB	NB	NB	NB
ROUNDUP® glyphosate	R	R	R	–	R	R	R	R	R	R	R	R
2,4-D[1/]	–	R	–	–	R	R	–	R	–	–	–	–
Contact Herbicides												
DINITRO GEN[2/] dinoseb DNBP	R	R	R	R	R	R	R	R	NB	R	R	R
PARAQUAT®	R	R	R	R	R	R	R	R	R	R	R	R
PETROLEUM SOLVENT [3/]	R	R	R	R	R	R	R	R	R	R	R	R

R = registered – = not registered NB = registered in nonbearing orchards or vineyards only

* Not in California

1/ MSMA and 2,4-D are registered and available under numerous trade names.

2/ Dinitro general is registered in California under many trade names and in combination with wetting agents and petroleum solvents as a contact weed killer.

3/ Petroleum solvents are available under varied trade names as weed oil.

Compiled from a report by Bill Fischer, Farm Advisor in Fresno County

This is a report of work in progress only. The chemicals and uses contained in this publication are experimental data and should not be considered as recommendations for use.

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.

WARNING ON THE USE OF CHEMICALS

Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in their original labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock.

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.

Consult your County Agricultural Commissioner for correct methods of disposing of leftover spray material and empty containers. Never burn pesticide containers.

PHYTOTOXICITY: Certain chemicals may cause plant injury if used at the wrong stage of plant development or when temperatures are too high. Injury may also result from excessive amounts or the wrong formulation or from mixing incompatible materials. Inert ingredients, such as wetters, spreaders, emulsifiers, diluents, and solvents, can cause plant injury. Since formulations are often changed by manufacturers, it is possible that plant injury may occur, even though no injury was noted in previous seasons.

No endorsement of named products is intended, nor is criticism implied of similar products which are not mentioned.

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