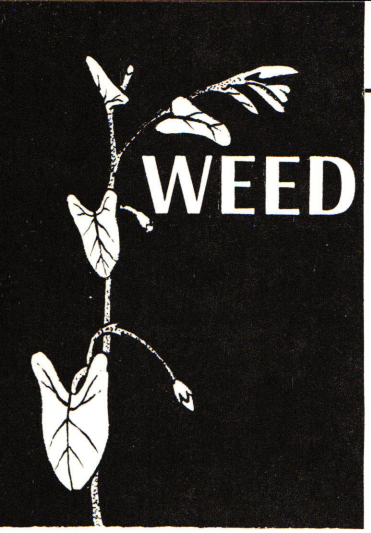
COOPERATIVE EXTENSION UNIVERSITY OF CALIFORNIA



WEED CONTROL NOTES

PROGRESS REPORT

WEED CONTROL

STUDIES FOR 1983

IN ALMONDS

Series 3:83

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Introduction and Summary

Weed control continues to be an important expense to almond growers. Many new herbicides are becoming available to agriculture of which several will be useful to almond growers.

Continued testing of sethoxydim (Poast) and fluazifop-butyl (Fusilade) suggest higher rates (1 lb/A) repeated twice may be necessary for the control of well established bermudagrass and johnsongrass. A standard nonphytotoxic oil and surfactant is added for optimum control but this need has not been evaluated in the west. This needs to be done as well as the optimum concentration in the sprya. The phytotoxicity to almond trees appears to be minimal even at elevated rates. More information is needed to increase the efficacy. The new herbicide R 40244 (Racer) continues to look promising for annual and perennial weed control in trees and vines. Registration by Stauffer Chemical Company is being pursued. Two oryzalin (Surflan) analogs look promising for trees and vines. They are pendimentalin (Prowl) and prodiamine (Rydex). Both will compete with oryzalin. A new replacement for simazine (Princep), terbutryne (Igran), which offers more safety and knockdown capabilities is being developed by Ciba-Geigy.

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Long term studies comparing tillage, strip tillage and nontillage (chemical weed control) showed no difference in yield between non tillage and strip tillage. Both were much better than tillage. All plots were tilled in 1981 in order to control excess bermuda buildup in the nontillage plots. This disruption of the roots may have shocked the trees into producing less whereas up to this year they have produced more than strip tilled plots.

The mowed vs. chemical nontillage plots yielded essentially the same this year (a light crop). These two nontillage trials and a third in a grower's field should be continued.

The experimental procedure, results and discussion of the individual trials will be found in the following separate reports.

INDEX

	Page No.
Screening for new orchard herbicides	2
Preemergence herbicides for annual weed control	10
Tillage vs. nontillage	18
New postemergence herbicides for annual grass control	21
Perennial weed control	
Bermudagrass	24
Yellow nutsedge	34
Bindweed	37
Chemical index	38
Pesticide use warning	40

SCREENING FOR NEW ORCHARD HERBICIDES

Screening new herbicides for weed control in horticultural crops. Lange, A. H. and W. D. Edson. A Hanford fine sandy loam soil at the Kearney Agricultural Center, Parlier, CA was prepared for planting in February 1983. Varieties used in this trial were 1/2 inch Durado plums, 3/8 inch Malling 110 apple rootstock, 1/2 inch black walnut rootstock, 1/2 inch O'Henry peach on nemaguard, 1/2 inch French prune on nemaguard, 5/8 inch Bartlett pear on Pyrus betulfolia rootstock, 3/8 inch Wonderful pomegranate seedlings, 1/4 inch Rough lemon rootstock and 1/2 inch bare rooted pistachio (Reps. 1 & 2 with P. integerrima and Reps. 3 & 4 with P. terebinthus). All were planted and sprinkled in on April 2, 1983. Ruby Cabernet and Thompson seedless grapes were also included in this trial. Acala cotton and Jamboree sweet corn were seeded through all plots on April 21, 1983. The cotton was replanted with new seed on May 20, 1983. Transplant tomatoes and direct seeded watermelons were also planted.

On April 22 all preemergence herbicides were applied and sprinkled in with 1-1/4 acre inch of water. On June 2 the postemergence herbicides were applied over the germinated weeds and row crops so as to hit about 6/8 inches of the trunks of the deciduous trees. This spray contacted about 3/4 of the citrus foliage and about half the pomegranate foliage. A 3-nozzle boom sprayed the chemical 5 feet on each side of the tree row in 50 gal/A of water. The weeds present in approximate order of prevalence were lambsquarter, lovegrass, hairy crabgrass, cupgrass, pigweed, yellow nutsedge, volunteer barley, sowthistle and puncturevine. Only sethoxydim (Poast) and fluazifop-butyl (Fusilade) received an added 0.5 percent oil surfactant mixture.

The preemergence herbicides showing significant injury to cotton were R 40244 (Racer) at 4 Lb/A (only) and metolachlor (Dual) at both 4 and 16 Lb/A. Both preemergence growth regulators EL 500 and PP 333 were hard on germinating cotton. Oxyfluorfen (Goal) outstandingly safe on germinating cotton even at 8 Lb/A. All the postemergence herbicides were phytotoxic to cotton except sethoxydim and fluazifop-butyl. SC 1056 was intermediate. Of the preemergence herbicides, R 40244 and prodiamine (Rydex) were toxic (particularly at the higher rates) to corn. All prostemergence herbicides were quite toxic to corn.

All preemergence herbicides did a good job of controlling lambsquarter. The postemergence herbicides PPG 1721, sethoxydim and fluazifop-butyl were weak on lambsquarter. All preemergence herbicides gave considerable control of annual grasses (lovegrass, cupgrass and crabgrass). The weakest were the growth regulators. All postemergence herbicides were active on grass except PPG 1721. SC 1056 was only partially active. All preemergence herbicides showed some activity on puncturevine and weakest was metolachlor. Most active was R 40244. Of the postemergence herbicides sethoxydim and fluazifop-butyl were weakest and SC 0224 was most active. The dinitro analine herbicides were quite weak on volunteer barley whereas most others were quite active. Yellow nutsedge, the most important weed species, showed resistance to most herbicides with exception of metolachlor, EL 500

and R 40244 preemergence. Of the postemergence herbicides SC 0224 was most active followed by AmHo 0661 and SC 1056. The later seemed to control nutsedge selectively in most crops and weeds. Pigweed was controlled by most preemergence herbicides with PP 333 being the weakest. Both PPG 1721 and SC 1056 were somewhat weak at burning down this species.

All preemergence herbicides appeared to be safe on newly planted trees. EL 500 and PP 333 caused severe stunting which did not show in the early ratings. Likewise the early ratings did not show significant injury from postemergence herbicides except on citrus which received considerable spray on the foliage. Here AmHo 0661 at both rates caused considerable injury. Most of the preemergence herbicides were safe on grapes with only a small early effect of R 40244 and metolachlor at the high rates. Of the postemergence herbicides AmHo 0661 was most toxic. SC 0224 was also damaging at both rates.

Most preemergence herbicides showed some damage on tomato transplants, particularly at the higher rate. Most safe was oxyfluorfen suggesting little vertical movement in the soil. Most toxic was R 40244. Of the postemergence herbicides both sethoxydim and fluazifop-butyl were safe. The good nutsedge herbicide, SC 1056, was quite toxic on tomatoes, but SC 0224 and AmHo 0661 were even more toxic. All preemergence herbicides showed considerable phytotoxicity to direct seeded watermelons. Least active was RH 0265. Both sethoxydim and fluazifop-butyl were quite safe on watermelon. SC 1056 showed some possibilities. Most phytotoxic were again SC 0224 and AmHo 0661 in direct seeded watermelons. (425-73-501-100-1-83).

Table 1.
The effect of several preemergence and postemergence herbicides on the control of several specific weed species (425-73-501-100-1-83).

Herbicides	Lb/A	Average Weed Control[1/]					
		Lambs-quarters	Grass	Puncture-Vine	Volunteer Barley	Nutsedge 6/3	Nutsedge 7/6
Simazine	2	10.0	6.8	5.0	7.8	2.5	2.5
Prodiamine	4	9.8	9.8	4.3	4.5	2.0	1.2
Prodiamine	16	10.0	10.0	7.5	3.5	0.0	1.0
Pendimethalin	4	10.0	10.0	5.0	1.0	0.0	1.5
Pendimethalin	16	10.0	10.0	8.8	3.8	0.0	1.5
Metolachlor	2	8.0	7.0	1.3	7.5	8.3	8.0
Metolachlor	8	9.8	8.3	5.0	8.5	9.5	8.8
Oxyfluorfen	2	9.3	9.5	5.5	6.0	2.3	5.0
Oxyfluorfen	8	10.0	9.8	8.8	7.8	6.0	5.5
RH 0265	1	9.8	6.0	2.5	10.0	1.5	2.8
RH 0265	4	10.0	8.0	10.0	7.8	3.0	5.0
R 40244	1	10.0	9.8	10.0	8.3	4.8	1.8
R 40244	4	10.0	10.0	10.0	10.0	8.5	8.0
EL 500	1	5.3	4.8	2.5	4.5	6.0	6.5
EL 500	4	10.0	7.3	9.3	5.8	10.0	9.8
PP 333	1	3.8	4.8	5.0	7.0	4.8	3.8
PP 333	4	10.0	6.0	9.5	5.3	8.3	8.0
PPG 1721	24g	0.0	0.5	2.5	0.0	2.5	0.0
PPG 1721	96g	0.0	0.0	0.0	0.0	2.5	1.2
AmHo 0661	1	9.8	9.8	10.0	10.0	7.5	6.5
AmHo 0661	4	10.0	10.0	9.5	10.0	8.8	6.2
Sethoxydim+Pace	1+5%	2.0	10.0	5.0	10.0	0.0	1.2
Sethoxydim+Pace	4+5%	2.0	10.0	5.0	10.0	3.3	0.8
Fluazifop-butyl+Pace	1+5%	3.3	10.0	2.5	9.3	3.8	2.0
Fluazifop-butyl+Pace	4+5%	3.5	7.5	5.0	7.0	1.3	0.0
SC 0224	4	10.0	10.0	10.0	10.0	8.3	7.2
SC 0224	16	10.0	10.0	10.0	10.0	9.5	8.2
SC 1056	1/4	9.3	5.0	6.0	4.0	7.8	4.2
SC 1056	1	9.5	7.5	10.0	7.0	8.8	4.8
Check (Paraquat+Pace)	(1+5%)	7.3	6.8	10.0	10.0	7.8	5.8

1/ Average of 4 replications where 0 = no weed control and 10 = complete weed control. Preemergence herbicides applied 4/22/83. Postemergence herbicides applied 6/2/83.

Table 2.
The effect of preemergence and postemergence herbicides on tree phytotoxicity.
(425-73-501-100-1-83).

Herbicides	Lb/A	Apple	Pear	Walnut	Pistachio	Almond	Peach	Plum	Prune	Pomegranate	Citrus
Simazine	2	2.5	0.8	0.5	2.5	1.8	2.2	0.8	3.2	0.2	0.5
Prodiamine	4	2.5	0.8	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0
Prodiamine	16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Pendimethalin	4	0.0	2.2	0.0	3.2	1.0	0.0	0.0	0.0	1.2	0.0
Pendimethalin	16	2.5	0.0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0
Metolachlor	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Metolachlor	8	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	2.0
Oxyfluorfen	2	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0
Oxyfluorfen	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RH 0265	2	0.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0
RH 0265	8	5.0	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.8
R 40244	1	0.0	0.2	0.5	0.0	1.2	1.0	0.0	0.5	0.0	0.0
R 40244	4	2.8	0.5	0.0	6.5	2.8	0.0	2.0	2.0	0.8	0.2
EL 500	1	1.2	1.2	1.2	2.5	0.0	0.5	0.2	0.0	0.0	0.0
EL 500	4	0.5	1.5	3.0	2.5	1.8	0.8	2.0	2.3	0.2	0.0
PP 333	1	0.0	0.8	0.0	2.5	1.2	0.2	0.8	0.8	0.8	0.0
PP 333	4	0.0	1.5	1.0	1.2	2.5	1.5	1.8	0.8	0.0	1.0
PPG 1721	24g	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.5	0.0	0.5
PPG 1721	96g	0.0	1.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0
AmHo 0661	1	2.2	1.5	0.5	2.5	1.5	1.5	0.8	1.2	0.0	5.5
AmHo 0661	4	4.0	1.8	0.2	2.5	0.5	0.8	1.0	1.2	1.8	7.0
Sethoxydim+Pace	1+5%	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sethoxydim+Pace	4+5%	0.0	0.0	2.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0
Fluazifop-butyl+Pace	1+5%	2.5	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0
Fluazifop-butyl+Pace	4+5%	0.0	0.0	0.0	0.0	0.5	1.2	0.5	1.0	0.5	0.0
SC 0224	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5
SC 0224	16	0.8	2.5	0.0	7.0	1.2	0.2	1.0	0.0	5.5	0.0
SC 1056	1/4	0.5	2.5	0.8	0.0	0.0	0.0	0.0	0.0	0.5	0.0
SC 1056	1	0.8	0.0	0.0	2.2	0.5	0.0	0.0	0.2	1.0	0.5
Check (Paraquat+Pace)	(1+5%)	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0

1/ Average of 4 replications where 0 = no phyto symptoms and 10 = total death to tree.
Preemergence applied 4/22/83. Postemergence applied 6/2/83. Evaluated 7/6/83.

Table 3.
The effect of preemergence and postemergence herbicides on weed control and vigor of total growth on several orchard tree species (425-73-501-100-1-83).

Herbicides	Lb/A	Weed Control 1/	Average Vigor 1/									
			Apple	Pear	Walnut	Pistachio	Almond	Peach	Plum	Prune	Pomegranate	Citrus
Simazine	2	4.0	7.8	8.5	5.8	9.2	8.0	7.8	9.2	7.8	8.0	9.2
Prodiamine	4	7.2	8.2	9.0	6.8	8.0	8.8	9.2	9.2	9.2	9.2	9.0
Prodiamine	16	9.0	9.0	9.0	7.0	9.2	7.8	9.5	9.8	9.0	9.8	9.8
Pendimethalin	4	8.2	8.2	8.8	5.2	7.2	6.8	8.2	8.5	7.2	8.2	9.5
Pendimethalin	16	9.5	8.2	8.5	7.0	8.8	8.8	8.8	9.5	8.0	9.2	10.0
Metolachlor	4	5.8	6.0	7.5	5.5	7.7	7.0	8.2	8.5	8.0	8.2	8.8
Metolachlor	16	7.8	9.2	7.5	7.8	8.8	6.5	8.8	9.0	8.5	8.8	8.5
Oxyfluorfen	2	6.8	8.0	7.2	7.5	8.0	8.2	9.0	9.0	8.5	10.0	9.0
Oxyfluorfen	8	9.5	9.5	9.2	6.8	9.0	8.0	8.5	10.0	9.2	9.2	9.5
RH 0265	2	4.8	6.2	7.8	7.0	7.2	6.8	7.8	7.5	8.0	7.2	8.2
RH 0265	8	7.2	7.0	9.5	6.2	9.2	8.5	8.5	9.0	9.0	9.0	8.8
R 40244	1	7.0	8.0	8.8	5.8	8.8	8.0	8.2	7.8	8.2	9.2	9.8
R 40244	4	9.0	8.8	8.8	8.0	3.5	8.0	9.0	9.0	8.2	8.0	9.2
EL 500	1	6.5	6.5	6.0	5.2	7.0	4.8	6.2	6.5	5.2	7.2	8.2
EL 500	4	9.0	7.0	6.2	5.0	6.5	3.5	4.2	4.2	4.8	6.2	8.8
PP 333	1	6.5	8.2	8.2	7.2	6.2	5.5	6.5	8.0	6.8	7.8	8.0
PP 333	4	7.8	7.0	7.8	5.5	5.0	4.5	5.5	7.0	6.5	8.2	9.0
PPG 1721	24g	3.8	6.5	6.5	5.0	7.5	4.8	5.0	5.2	5.5	8.0	8.0
PPG 1721	96g	5.8	7.8	5.5	6.5	10.0	7.0	8.0	7.8	6.2	7.8	8.0
AmHo 0661	1	7.5	7.8	7.5	7.2	7.2	7.8	7.5	8.5	8.2	9.8	7.2
AmHo 0661	4	7.2	6.0	8.5	6.5	8.8	8.2	8.5	8.2	8.5	9.8	1.2
Sethoxydim+Pace	1+5%	5.8	7.0	7.2	7.2	7.8	7.0	8.5	9.0	7.5	9.0	9.2
Sethosydim+Pace	4+5%	7.0	7.5	7.2	6.5	8.8	6.2	8.0	8.0	7.2	8.0	8.8
Fluazifop-butyl+Pace	1+5%	6.8	9.0	8.2	7.2	7.0	8.2	8.5	7.8	7.5	8.0	8.5
Fluazifop-butyl+Pace	4+5%	7.8	8.0	9.0	7.0	7.2	7.2	7.2	8.0	7.0	8.2	8.2
SC 0224	4	5.5	6.2	8.5	6.8	8.0	7.5	7.6	7.5	8.2	6.5	8.2
SC 0224	16	6.0	7.8	6.0	6.2	4.5	7.5	8.0	8.0	7.5	2.2	7.2
SC 1056	1/4	1.0	5.0	6.5	6.0	7.8	4.0	5.5	5.5	5.5	6.0	7.5
SC 1056	1	3.5	7.2	6.8	5.8	6.0	7.2	8.0	8.0	8.0	7.0	8.0
Check (Paraquat+Pace)	(1+5%)	3.2	7.8	7.2	6.5	9.0	7.5	7.8	9.0	8.5	9.0	7.8

1/ Average of 4 replications where 0 = no effect and 10 = best, most vigorous growth or best weed control. Preemergence applied 4/22/83. Postemergence applied 6/2/83. Evaluated 10/18/83.

Table 4.
The effect of soil and foliar applied growth regulators on the growth of ten tree species (425-73-501-100-1-83).

Herbicides	Lb/A	Apple	Pear	Walnut	Pistachio	Almond	Peach	Plum	Prune	Pomegranate	Citrus
Simazine	2	1.2	2.4	1.8	2.2	2.1	2.1	2.1	2.0	1.0	1.5
Prodiamine	4	1.0	2.5	1.9	2.3	2.4	2.8	2.3	2.1	1.4	1.4
Prodiamine	16	1.4	2.5	1.8	2.4	2.6	3.1	2.6	2.5	1.6	1.4
Pendimethalin	4	1.1	2.5	1.6	2.2	2.1	2.5	2.0	2.1	1.5	1.6
Pendimethalin	16	1.2	2.6	1.1	2.3	2.6	2.4	2.3	2.3	1.5	1.1
Metolachlor	4	1.0	2.4	1.4	2.0	2.0	2.3	2.4	1.6	1.4	1.4
Metolachlor	16	1.4	2.4	1.3	1.9	2.0	2.6	2.1	2.1	1.1	1.3
Oxyfluorfen	2	1.4	2.4	1.5	2.2	2.3	2.5	2.1	2.0	1.8	1.5
Oxyflurofen	8	0.8	2.4	1.6	2.1	2.3	2.4	2.5	2.5	1.4	1.6
RH 0265	2	1.0	2.5	1.3	1.7	2.3	2.4	2.0	2.1	1.3	1.3
RH 0265	8	1.0	2.5	1.4	2.3	2.3	2.1	2.1	2.5	1.3	1.4
R 40244	1	1.1	2.5	1.3	2.2	2.3	2.1	2.0	2.3	1.1	1.3
R 40244	4	1.2	2.6	1.8	1.5	2.9	2.6	2.5	2.3	1.1	1.8
EL 500	1	1.1	2.4	1.5	2.0	2.4	1.6	1.9	1.8	1.6	1.5
EL 500	4	1.1	2.0	1.5	2.0	1.9	1.8	1.5	1.6	1.4	1.5
PP 333	1	1.1	2.3	1.3	1.7	2.0	1.9	2.0	1.8	1.4	1.3
PP 333	4	1.1	2.3	1.8	1.8	2.3	1.5	2.0	1.9	1.4	1.8
PPG 1721	24g	1.0	2.1	1.0	2.0	2.1	1.5	1.5	1.8	1.4	1.0
PPG 1721	96g	1.1	2.5	1.4	3.2	2.1	2.3	1.9	2.0	1.6	1.4
AmHo 0661	1	1.0	2.6	1.1	1.5	2.1	2.3	2.4	2.3	1.6	1.1
AmHo 0661	4	1.0	2.5	1.0	1.5	2.4	2.5	2.1	2.0	1.5	1.0
Sethoxydim+Pace	1+5%	1.0	2.5	1.5	1.6	2.1	2.4	2.1	1.9	1.4	1.5
Sethoxydim+Pace	4+5%	1.1	2.5	1.5	1.8	2.1	2.3	1.9	1.8	1.4	1.5
Fluazifop-butyl+Pace	1+5%	1.1	2.6	1.1	1.5	2.4	2.5	2.3	1.9	1.5	1.1
Fluazifop-butyl+Pace	4+5%	1.1	2.5	1.3	1.4	2.3	2.0	2.1	1.9	1.4	1.3
SC 0224	4	1.1	2.3	1.5	1.9	2.8	2.4	1.9	1.9	1.1	1.5
SC 0224	16	1.2	2.2	1.2	2.5	2.5	2.0	2.3	2.2	0.8	1.2
SC 1056	1/4	0.9	24.	1.1	1.6	2.1	1.9	1.9	1.8	1.1	1.1
SC 1056	1	1.0	2.8	0.8	2.3	2.3	2.3	2.2	2.2	1.7	0.8
Check (Paraquat+Pace)	(1+5%)	1.5	2.6	1.3	2.0	2.1	2.3	2.0	2.1	1.8	1.3

1/ Average of 4 replications. All diameters taken to the nearest cm. Measurements taken on 12/29/83.

Table 5.
A comparison of growth regulators on tree trunk diameters and tree heights on ten tree species (425-73-501-100-1-83).

Trunk Diameters[1/]

Herbicide	Lb/A	Apple	Pear	Walnut	Pistachio	Almond	Peach	Plum	Prune	Pomegranate	Citrus
EL 500 (Pre)	1	1.1	2.4	2.0	2.0	2.4	1.6	1.9	1.8	1.6	1.5
EL 500 (Pre)	4	1.1	2.0	1.8	2.0	1.9	1.8	1.5	1.6	1.4	1.5
PP 333 (Pre)	1	1.1	2.3	1.8	1.8	2.3	1.5	2.0	1.8	1.4	1.8
PP 333 (Pre)	4	1.1	2.5	1.6	3.2	2.1	2.3	1.9	2.0	1.6	1.4
PPG 1721 (Post)	24g	1.0	2.1	1.6	2.0	2.1	1.5	1.5	1.8	1.4	1.0
PPG 1721 (Post)	96g	1.1	2.5	1.6	3.2	2.1	2.3	2.3	2.0	1.6	1.4
Simazine (Pre)	2	1.2	2.4	1.8	2.2	2.1	2.1	2.1	2.0	1.0	1.5
Check	-	1.5	2.6	1.5	2.0	2.1	2.3	2.0	2.1	1.8	1.3

Tree Heights[1/]

Herbicide	Lb/A	Apple	Pear	Walnut	Pistachio	Almond	Peach	Plum	Prune	Pomegranate	Citrus
EL 500 (Pre)	1	98	103	68	109	108	104	145	128	95	99
EL 500 (Pre)	4	91	114	66	73	70	86	93	107	64	96
PP 333 (Pre)	1	119	135	91	106	96	102	179	143	100	90
PP 333 (Pre)	4	103	135	75	67	84	93	157	150	108	130
PPG 1721 (Post)	24g	91	100	66	113	95	94	114	147	101	95
PPG 1721 (Post)	96g	114	95	91	150	129	127	176	161	100	96
Simazine (Pre)	2	110	127	107	118	132	114	191	152	114	102
Check	-	113	118	68	142	126	137	166	186	123	91

1/ Average of 4 replications. All measurements taken to the nearest cm. Measurements taken on 12/29/83.

PREEMERGENCE HERBICIDES FOR ANNUAL WEED CONTROL

The effect of long term use of preemergence herbicides in strip treated orchard crops. Lange, A. H. and W. D. Edson. Four year old fruit trees strip treated annually since 1979 were treated March 11, 1983. The weed control was rated October 18, 1983 and showed poor crabgrass and watergrass control with two preemergence herbicides, simazine (Princep) and napropamide (Devrinol) and two postemergence herbicides SC 0224 and paraquat (Ortho Paraquat CL*). The contorl on three compositae species, flaxleaved fleabane, cudweed and marestail was excellent with simazine, napropamide, norflurazon (Solicam) and R 40244 (Racer). The oxyfluorfen (Goal) was poor as was the paraquat check. Oryzalin (Surflan) was also somewhat weak compared to napropamide.

The only symptoms observed even after 4.8 inches of rainfall within a month of treatment was from 2 Lb/A simazine on prunes only. Mission almond in an adjacent test also showed slight symptoms. (425-73-501-115-1-80).

The effect of six preemergence herbicides on the control of annual orchard weeds (425-73-501-115-1-80).

		Weed Control[1/]		
Herbicides	Lb/A	General[2/]	Crabgrass & Lovegrass	Flaxleaved Fleabane Cudweed & Marestail
Simazine	2	8.6	3.8	10.0
Napropamide	8	4.5	1.4	9.2
Oryzalin	8	3.1	9.7	7.3
Oxyfluorfen	4	2.9	9.7	4.2
Norflurazon	4	8.0	10.0	9.8
R 40244	4	8.0	9.7	10.0
SC 0224	4	5.2	0.3	9.6
Check (Paraquat)	1	0.0	0.0	0.6

1/ Average of 9 replications where 0 = no effect and 10 = no weeds. Evaluated 10/18/83.
2/ Evaluated 5/30/83.

Long lasting effects of preemergence combinations on annual weed control. Lange, A. H. and W. D. Edson. A long term study on almond trees and the annual weed population was commenced March 29, 1977 in a Hanford fine sandy loam (O.M. 0.75%; sand 59%; silt 33%; clay 8%). The combinations were changed somewhat with weed population shifts, however, the plots with napropamide (Devrinol) and oryzalin (Surflan) have continued to receive these herbicides year after year. Those plots receiving oxyfluorfen (Goal) also received this herbicide for the total period.

The last combination treatments were applied January 17, 1982 and the restuls appear in the table. The original trees were evaluated for 5 years and pulled out in the winter of 1982. The soil was tilled to 8 inches with a Howard rotovator furrowed out to 10 inches and planted with young almond trees.

The herbicides were not reapplied. The weed control was evaluated 21 months after treatment. The results in the table demonstrate the long residual activity of oxyfluorfen and oryzalin in combination. (425-73-501-146-1-77)

The residual activity of 4 preemergence combination treatments at 21 months. (425-73-501-146-1-77).

Herbicides	Lb/A	Average[1/] Weed Control
Simazine+Napropamide	1+4	18.8%
Simazine+Oryzalin	1+4	42.3%
Oxyfluorfen+Napropamide	2+4	39.6%
Oxyfluorfen+Oryzalin	2+4	74.2%
Check	-	0.0%

1/ Applied 1/17/82. Evaluated 10/15/83. Weeds included in order - lovegrass, crabgrass, flaxleaved fleabane, lambsquarter, marestail, sowthistle, filaree, all germinated summer 1983.

Annual weed control in almonds. Vargas, R. N. Cooperator: Don Schnoor. A 6th leaf almond orchard growing on Traver sandy loam was divided in two tree plots and replicated four times in a randomized block design. Herbicides were applied on December 27, 1982 in 50 gallons of water per acre. Paraquat (Ortho Paraquat CL*) at .5 pound plus Agridex at .25% were added to treatments 1 through 7 and glyphosate (Roundup) at 1 pound was added to treatments 8 through 13 to kill existing weed seedlings which included chickweed and annual bluegrass. As is expected the paraquat treated plots controlled the existing weeds much faster than the glyphosate treatments, but contact control six weeks after application was the same.

The various materials and rates can be seen in the following table. An evaluation on March 29 indicated excellent control of winter annual weeds with all herbicides. Oxyfluorfen (Goal) was giving 87 percent control, chickweed a resistant weed to oxyfluorfen was present. A later evaluation on May 27 indicated good control but marestail, a summer annual, was starting to break through many of the treatments. (425-20-501-146-1-83)

Treatments	Lb/A	Average[1/] Winter Annual Weed Control 3/29/83	Summer Annual Weed Control 5/27/83
Caliber 90	1	10.0	9.8
Pendimethalin	4	10.0	10.0
Norflurazon	2	10.0	9.0
Norflurazon	4	9.8	8.0
Oxyfluorfen	1.5	8.8	9.8
Caliber 90+Napropamide	1+4	10.0	9.5
Caliber 90+Oryzalin	1+4	10.0	9.8
Pendimethalin+Oxyfluorfen	4+1.5	10.0	10.0
Oxyfluorfen+Norflurazon	1.5+2	10.0	9.8
Caliber 90+Norflurazon	1+2	10.0	10.0
Napropamide	4	10.0	8.2
Oryzalin	4	10.0	10.0
Check	-	5.8	2.2

1/ Average of 4 replications where 0 = no control and 10 = 100% control.

Annual weed control in nonbearing almonds. Vargas, R. N. Cooperator: Don Schnoor. Application of various preemergence herbicides were made for the first time to the berms of a three year old almond orchard growing on a Traver sandy loam soil. The herbicide application was made on January 14, 1983 with paraquat (Ortho Paraquat CL*) at .5 pound and .25% X-77 added to control existing seedling chickweed and grasses.

As can be seen in the table, an evaluation on March 29, 1983 indicated excellent control with combinations of herbicides. Chickweed, a resistant weed to oxyfluorfen (Goal), caused a lower weed rating. An evaluation on May 27 indicated increased weed pressure for most treatments. Pendimethalin (Prowl) was giving poor control with lambsquarter and mustard being the predominant weeds present. Lambsquarters and hairy nightshade were present in the oxyfluorfen plots causing a lower 70 percent control. (425-20-501-146-2-83)

Treatments	Lb/A	Average[1/] Winter Annual Weed Control 3/29/83	Summer Annual Weed Control 5/27/83
Caliber 90	.5	9.8	7.2
Caliber 90	1	10.0	8.8
Norflurazon	2	8.5	7.8
Norflurazon	4	9.2	8.5
Oxyfluorfen	1.5	8.0	7.0
Pendimethalin	4	8.2	6.0
Caliber 90+Norflurazon	.5+2	10.0	8.8
Caliber 90+Pendimethalin	.5+4	10.0	8.5
Pendimethalin+Oxyfluorfen	4+1.5	9.0	7.0
Norflurazon+Oryzalin	2+4	10.0	8.0
Norflurazon+Napropamide	2+4	8.8	8.8
Norflurazon+Oxyfluorfen	2+1.5	10.0	9.5
Check	-	0.0	0.0

1/ Average of 4 replications where 0 = no control and 10 = 100% control.

Annual weed control in almonds. Vargas, R. N. Cooperator: Ron Leach. A mature almond orchard growing on a Grangeville sandy loam soil was treated for the third consecutive year. Paraquat (Ortho Paraquat CL*) at .5 pound plus Agridex at .5% was added to all treatments to kill existing filaree, chickweed and mustard seedlings. The application of herbicides were made on December 10, 1982 in 50 gallons of water per acre.

As can be seen by the results in the following table, weed pressure was heavy in this orchard. Oxyfluorfen in combination with simazine (Princep), oryzalin (Surflan) and napropamide (Devrinol) was giving excellent early season control on March 29. Simazine and napropamide by themselves were giving poor control. An evaluation of flaxleaf fleabane and marestail on August 2 indicated good to excellent control with all materials except napropamide which was giving approximately 50 percent control. (425-20-501-146-2-81)

Treatments	Lb/A	Weed Control 3/29/83 1/	Marestail & Flaxleaf Fleabane 8/2/83 1/
Simazine	1	6.8	8.8
Simazine	2	9.5	10.0
Napropamide	4	5.5	5.2
Oryzalin	4	7.2	9.0
Oxyfluorfen	2	8.5	9.5
Oxyfluorfen	1	8.0	8.8
Simazine+Napropamide	1+4	7.8	8.8
Simazine+Oryzalin	1+4	9.0	10.0
Simazine+Oxyfluorfen	1+2	9.8	10.0
Oryzalin	2	7.0	9.5
Oxyfluorfen+Napropamide	2+4	10.0	9.2
Oxyfluorfen+Oryzalin	2+4	10.0	10.0
Oxyfluorfen+Triton Ag98	2+5%	9.0	8.0
Check	-	0.0	0.0

1/ Average of 4 replications where 0 = no control and 10 = 100% control.

Annual weed control in almonds. Vargas, R. N. Cooperator: Bob Cavaletto. A mature almond orchard growing on a Grangeville sandy soil was treated for the third consecutive year. Treatments were made on November 21, 1980, October 30, 1981 and December 10, 1982. At the time of this past year's application, the berms were free of weeds and trash making this ideal conditions for herbicide application. Herbicides were applied in 50 gallons of water per acre. Throughout the duration of this study the weed pressure has been low.

An evaluation on March 3, 1983 indicated excellent control with combinations of herbicides with lesser control being obtained with single application. Again, a later evaluation on May 26 indicated good to excellent control of flaxleaf fleabane and marestail with combination of materials as compared with the single herbicide applications. (425-20-501-146-1-81)

		Average[1/]	
		Weed Control Rating	Marestail & Flaxleaf Fleabane
Herbicides	Lb/A	3/28/83	5/26/83
Simazine	1	8.8	9.0
Napropamide	4	8.8	7.5
Oryzalin	4	8.8	8.5
Oxyfluorfen	2	10.0	9.5
Simazine	2	9.5	9.0
Simazine+Napropamide	1+4	10.0	8.8
Simazine+Oryzalin	1+4	9.0	8.5
Simazine+Oxyfluorfen	1+2	10.0	9.8
Oryzalin	2	9.0	8.0
Oxyfluorfen+Napropamide	2+4	10.0	10.0
Oxyfluorfen+Oryzalin	2+4	10.0	9.8
Oxyfluorfen	1	10.0	9.5
Check	-	0.0	0.0

1/ Average of 4 replications where 0 = no control and 10 = 100% control.

The timing of irrigation after the incorporation of oxyfluorfen in relation to timing after application. Lange, A., J. Schlesselman and W. D. Edson. Soil was prepared and treated with oxyfluorfen (Goal) at 28, 21, 14, 7, 3 and 0 days before irrigation beginning August 5, 1983. The soil temperature was 107° at 1 inch on August 5 and 110° on September 2. The soil surface was dry during this period on; September 2 sprinklers were turned on for a total of 1 acre inch. On September 7 five crops were planted through all plots. For nine days the soils were irrigated daily with 0.2 acre inch to 0.8 acre inch for a total of 3.7 acre inches until most of the crops were germinated. Ratings were taken October 5. The crops and weeds were burned out with paraquat (Ortho Paraquat CL) and reseeded on October 12 after the seeded line had been worked slightly by breaking the crust.

The barley and lettuce were rated on November 1. The broccoli was rated November 25. All crops showed greatest activity at 7 days with a leveling off at that point in these rather warm soils. (425-73-506-5-83)

Table 1. The effect of timing between application and sprinkler incorporation of oxyfluorfen (425-73-506-5-83).

Herbicide	Lb/A	Treatment Date	Average Grass Control[1/]	Average Vigor[2/] Cole Crop	Cucumber
Oxyfluorfen	1/2	8/5 (28 days)	9.2	8.8	8.0
Oxyfluorfen	2	8/5 (28 days)	10.0	10.0	9.5
Oxyfluorfen	1/2	8/12 (21 days)	8.8	8.5	7.5
Oxyfluorfen	2	8/12 (21 days)	10.0	9.5	8.5
Oxyfluorfen	1/2	8/19 (14 days)	9.2	9.0	8.2
Oxyfluorfen	2	8/19 (14 days)	10.0	10.0	10.0
Oxyfluorfen	1/2	8/26 (7 days)	8.8	9.0	8.0
Oxyfluorfen	2	8/26 (7 days)	10.0	10.0	10.0
Oxyfluorfen	1/2	8/30 (3 days)	10.0	10.0	8.8
Oxyfluorfen	2	8/30 (3 days)	10.0	10.0	10.0
Oxyfluorfen	1/2	9/1 (1 day)	9.8	9.8	9.0
Oxyfluorfen	2	9/1 (1 day)	10.0	10.0	10.0
Oxyfluorfen	1/2	9/2 (0 day)	9.5	10.0	9.0
Oxyfluorfen	2	9/2 (0 day)	10.0	10.0	10.0
Check	-		3.8	4.0	5.8
Check	-		3.8	4.8	5.0

1/ Average of 4 replications where 0 = no control and 10 = best possible control. Seeded 9/5/83. Evaluated 10/5/83.
2/ Average of 4 replications where 0 = crop dead and 10 = healthy, vigorous crop.

Table 2. The effect of timing between oxyfluorfen applied preemergence and sprinkler irrigation or incorporation on early residual activity as expressed by lettuce, broccoli, and barley vigor. (425-73-506-5-83).

Herbicides	Lb/A	Days	Average Vigor[1/]		
			Lettuce	Broccoli	Wheat
Oxyfluorfen	1/2	28	3.0	6.2	7.8
Oxyfluorfen	2	28	0.0	5.2	6.8
Oxyfluorfen	1/2	21	4.2	7.5	8.0
Oxyfluorfen	2	21	0.0	3.8	6.0
Oxyfluorfen	1/2	14	4.2	5.0	7.8
Oxyfluorfen	2	14	0.0	4.5	6.2
Oxyfluorfen	1/2	7	5.0	6.8	7.8
Oxyfluorfen	2	7	0.0	5.0	5.2
Oxyfluorfen	1/2	3	1.8	4.2	6.2
Oxyfluorfen	2	3	0.0	4.2	5.5
Oxyfluorfen	1/2	1	1.8	6.0	7.0
Oxyfluorfen	2	1	0.0	3.5	4.5
Oxyfluorfen	1/2	0	1.2	5.0	6.8
Oxyfluorfen	2	0	0.0	2.0	2.8
Check			5.5	7.0	7.5
Check			7.0	7.0	8.2

1/ Average of 4 replications where 0 = no stand and 10 = best stand and vigor. Treated 8/5 & 9/2/83. Seeded 10/12/83. Evaluated 11/25/83.

TILLAGE VS. NONTILLAGE

The long term effects of three cultural methods on orchards. Lange, A. H. and W. D. Edson. Mission almond and Tilton apricot both on nemaguard rootstock have been under three types of cultrual methods for eight years. Yields have favored nontillage in previous years. This year the growth is about even, but the yields were in favor of strip nontillage. These results suggest that the incorporation of trifluralin (Treflan) during the winter of 1981-82 may have upset the higher growth and yield results observed earlier. (425-73-501-H14-2-75).

The long term effects of 3 cultural methods in orchards (425-73-501-H14-2-75)

Method	Average[1/] Tree circumference Apricots	Almonds	Ave.	Yield gm/Tree Almonds[2/]
Tillage	89.7	46.4	68	9,695
Strip Tillage	91.4	50.5	71	16,800
Overall Chemical	87.9	52.0	70	13,575

1/ Average of 20 replications.
2/ Weights taken in grams.
All treatments received incorporated trifluralin in the winter of 1982-83 in order to control bermudagrass. The shallow roots were destroyed. Nutsedge increased.

The effect of continued use of herbicide combinations in young almond trees. Lange, A. H. and W. D. Edson. Soils continuously treated with preemergence herbicides are from time to time subject to replanting. These soils are usually ripped, releveled and fumigated before replanting. However, in the present trial the old trees were removed. Herbicides were applied annually from March 29, 1977 to November 1981. The soil was rototilled to a depth of 6-8 inches planted to barley March 8, 1982. The barley was worked up after a few weeks and the plots were replanted to close planted Nonpareil and Carmel varieties on nemaguard rootstocks on March 22, 1983.

The plots were retreated February 1, 1983. In the summer of 1983 a large, but consistent, growth difference in favor of simazine (Princep) and napropamide (Devrinol) was noted. The flaxleaved fleabane and marestail were controlled best by the combination of simazine and napropamide. At the same time the control annual summer grasses was poorest. Oxyfluorfen (Goal) plus napropamide gave the poorest broadleaf weed control. The absence of flaxleaved fleabane and marestail plus the heavy population of grass or no grass at all early may have resulted in the good color and growth observed throughout the summer in the simazine and napropamide plots. (425-73-501-146-1-76)

The effect of soil applied herbicide combinations on the fall foliage and the control of 2 weed species (425-73-501-146-1-76).

		Average			Young Almonds	
		Marestail+ Flaxleaved Fleabane 1/		Lovegrass and Crabgrass 2/	Foliar Vigor 3/	Diameter (cm)
Herbicide	Lb/A	5/30	10/15	10/15	10/15	10/23
Simazine+Napropamide	1+6	9.4	8.57	3.71	5.54	2.8
Simazine+Oryzalin	1+6	8.3	8.38	8.63	3.91	2.7
Oxyfluorfen+Napropamide	2+6	4.3	1.57	8.55	4.23	2.6
Oxyfluorfen+Oryzalin	2+6	6.7	5.34	9.79	5.77	3.0

1/ Average of 22 replications where 0 = no control and 10 = no weeds.
2/ Average of 35 replications where 0 = no control and 10 = no weeds.
3/ Average of 38 replications where 0 = no leaves remaining and 10 = most healthy, green leaves.

A comparison of the effect of mowing vs. chemical weed control on two almond varieties. Lange, A. H. and W. D. Edson. Young almond trees on nemaguard rootstock were planted 8 feet apart in rows 12 feet apart with prunes (Block I), peaches (Block II), and plums (Block III) planted between each plot as guard trees. The trees for this experiment were dug in December 1979 and planted in January 1980. The herbicide used in the 4½ foot strip under the tree row and across the centers in the non-mowed plots was a combination of oxyfluorfen (Goal) plus oryzalin (Surflan). The first application occurred February 28, 1980. The strips and centers were retreated annually. In 1981 simazine (Princep) was added to help control marestail and flaxleaved fleabane.

The results suggest the same or better growth with complete chemical, but poorer yield in 1983. (425-73-501-146-1-80)

Table 1.
The effect of mowing vs. complete chemical weed control on the growth and yield of 2 varieties of young almonds (425-73-501-146-1-80).

Treatment	Variety	Diameter in cm 1981	1982	1983	1983 Increase
Mowed	Mission	6.8	8.7	10.6	1.9
Chemical	Mission	8.3	10.2	12.2	2.0
Mowed	NonPariel	6.3	7.9	10.1	2.2
Chemical	NonPariel	7.4	9.4	11.7	2.3

1/ Average of 64 single tree measurements.

Table 2.
The effect of mowing vs. chemical weed control on the growth and yield of 2 almond varieties (425-73-501-146-1-80)

Treatment	Average[1/] 1982 Diam.	1983 Diam.	% Inc.	1983 Yield (kg)
Mission				
Mowed Center	8.7	10.6	-	1.42
Complete Herbicide	10.2	12.2	5%	0.77
NonPariel				
Mowed Centers	7.9	10.1	-	0.52
Complete Herbicide	9.4	11.7	5%	0.39

1/ Average of 64 trees.

NEW POSTEMERGENCE HERBICIDES FOR ANNUAL GRASS CONTROL

Postemergence control of annual grasses. Edson, W. D. and A. H. Lange. A uniform stand of hairy crabgrass and lovegrass about 8 inches tall was sprayed May 27, 1983 and again June 6 with 3 herbicides in 50 gallons per acre.

The lower rates were not adequate. Fluazifop-butyl (Fusilade) appeared to be weaker than sethoxydim (Poast) or Dow 4570. A rate of 1/4 + 1/4 was adequate for annual grass control in this experiment. A single 1 pound per acre rate gave essentially complete grass kill. (425-73-501-115-1-83).

The effect of 2 new postemergence herbicides on 8 inch annual grass (425-73-501-115-1-83)

Herbicide	Lb/A	Average[1/] Annual Grass Control
Fluazifop-butyl	1/8+1/8	0.8
Fluazifop-butyl	1/4+1/4	2.8
Fluazifop-butyl	1/2+1/2	8.3
Fluazifop-butyl	1	9.5
Sethoxydim	1/8+1/8	4.0
Sethoxydim	1/4+1/4	9.0
Sethoxydim	1/2+1/2	10.0
Sethoxydim	1	9.3
Dow 4570	1/8+1/8	5.0
Dow 4570	1/4+1/4	10.0
Dow 4570	1/2+1/2	10.0
Dow 4570	1	10.0
Check	-	0.0

1/ Average of 4 replications where 0 = no control and 10 = total control. Treated 5/27/83 and 6/6/83. Evaluated 7/5/83.

The effect of four new postemergence herbicides on the control of summer annual grasses. Edson, W. D. Annual crabgrass and lovegrass 8-14 inches tall and heading out were sprayed betweed 5 and 6 PM on June 10, 1983 using 3 - 8004 nozzles at 30 psi. The air temperature was about 78°F. The amount of water was 50 gpa. All herbicides had 0.5% Pace added to the spray solution.

The initial effect rated July 5, suggested sethoxydim (Poast) and Dow 4570 to be the more active grass herbicides at equivalent rates. (425-73-501-146-1-83).

A comparison of a single application of 4 grass herbicides on annual grass (425-73-501-146-1-83)

Herbicides	Lb/A	Average[1/] Weed Control
Sethoxydim	1/2	7.3
Sethoxydim	1	9.5
Fluazifop-butyl	1/2	6.0
Fluazifop-butyl	1	7.3
Dow 4570	1/2	8.8
Dow 4570	1	9.8
SC 1084	1/2	4.3
SC 1084	1	6.3
Check	-	0.0

1/ Average of 4 replications where 0 = no weed control and 10 = total death to weeds. Treated 6/8/83. Evaluated 7/5/83.

A comparison of new postemergence herbicides for annual grass control. Edson, W. D. A heavy stand of annual summer grass (lovegrass and hairy crabgrass) 8 to 12 inches tall, was sprayed July 8, 1983 at 2 p.m. All herbicides included 0.5% Pace. All herbicides have some grass control and naturally no broadleaf control. The most active grass herbicide in this trial appeared to be Dow 4570. Both bluazifop-butyl (Fusilade) and sethoxydim (Poast) are being considered for registration in pistachio and many other broadleaf crops. (425-73-501-125-1-83).

A comparison of annual grass control herbicides
(425-73-501-125-1-83)

		Average[1/]		
Herbicides	Lb/A	Weed Control 8/31	Annual Grass 11/4	Annual Broad-leaves 11/4
Sethoxydim	1/2	4.0	6.0	4.5
Sethoxydim	1	6.8	8.0	5.2
Fluazifop-butyl	1/2	6.0	7.0	3.8
Fluazifop-butyl	1	7.8	8.0	2.8
Dow 4570	1/2	7.8	7.8	6.0
Dow 4570	1	10.0	10.0	1.5
SC 1084	1/2	4.8	6.2	4.2
SC 1084	1	4.8	5.5	4.0
Check	-	0.0	0.8	5.2

1/ Average of 4 replications where 0 = no control and 10 = 100% control. Most prominent species in this experiment were southwestern cupgrass, hairy crabgrass and lovegrass; the broadleaves were all pigweeds, tumbling and redroot. Evaluated 8/31 and 11/4/83.

PERENNIAL WEED CONTROL - BERMUDAGRASS

The control of bermudagrass in a young almond orchard after two years of treatment. Lange, A. H. and W. D. Edson. Continuous use of oryzalin (Surflan) does help to keep the infestation of bermuda down as shown in this experiment. Likewise R 40244 (Racer) even at low rates helps prevent the build up of bermuda. These plots were oversprayed by the grower at least once. The increase resulting from soil applied herbicides can be observed with the "untreated" check. (425-10-501-146-1-82).

		Average[1/]		
		Nutsedge Control	Bermudagrass Control	
Herbicides	Lb/A	5/20/83	5/20/83	11/8/83
Oryzalin	4	6.8	9.0	8.0
Oryzalin	8	7.0	8.2	8.0
R 40244	1	8.0	6.5	5.2
R 40244	2	8.5	8.8	8.2
SC 0224	2	7.0	6.2	4.2
SC 0224	4	5.2	7.8	4.5
Napropamide	4	7.0	5.5	4.5
Napropamide	8	5.2	5.2	5.2
Check	-	3.8	4.5	1.8

1/ Average of 4 replications where 0 = no effect and 10 = complete kill.

The control of heavily infested bermudagrass. Lange, A. H. and W. D. Edson. A heavy infestation of bermudagrass was tilled up to a depth of eight inches. Trifluralin (Treflan) at 6 Lb/A was sprayed on the prepared soil filled with chopped up bermuda. On March 17, 1983 norflurazon (Solicam) was applied to the soil surface and incorporated by a spring of heavy rainfall (3.45 inches). (425-73-502-105-1-83)

The control of heavily infested bermudagrass
(425-73-502-105-1-83)

Herbicide	Lb/A	Average[1/] Bermudagrass Control 7/9/83	10/16/83	11/24/83
Trifluralin+Norflurazon	6+2	7.5	8.2	4.5
Trifluralin+Norflurazon	6+4	8.2	8.5	6.0
Trifluralin+Norflurazon	6+8	8.2	8.5	6.0
Trifluralin	6	7.2	8.2	6.7
Check	-	0.0	0.0	0.0

1/ Average of 4 replications where 0 = no effect and 10 = total kill of weed.

Established bermudagrass control from a single fall application. Lange, A. H. and W. D. Edson. A heavy old infestation of bermudagrass vigorously growing was sprayed October 1, 1982 with five postemergent herbicides.

When rated on October 28 for initial effect, all chemicals gave some control. When evaluating the regrowth in March and May 1983, the glyphosate (Roundup)-type herbicides gave by far the best lasting control. The two new grass killers were applied only once on mature bermuda. In general, these herbicides sprayed only once have not been observed to be effective. However, in this experiment they showed considerable activity. (425-73-502-1-83).

A comparison of five postemergence herbicides on the control of established bermudagrass (425-73-502-1-83).

Herbicides	Lb/A	Average[1/] Bermudagrass Control 10/28/82	3/28/83	5/10/83
Fluazifop+Pace	1/2+1%	6.3	5.3	5.3
Fluazifop+Pace	1+1%	7.0	7.7	6.3
Fluazifop+Pace	2+1%	7.7	7.0	4.7
Sethoxydim+Pace	1/2+1%	5.7	4.3	4.7
Sethoxydim+Pace	1+1%	6.7	6.7	7.7
Sethoxydim+Pace	2+1%	7.0	7.7	7.3
NC 28260	1	2.0	3.7	3.0
NC 28260	2	1.3	5.7	6.0
NC 28260	4	5.7	4.3	3.0
Glyphosate	2	8.0	8.0	7.3
Glyphosate	4	9.7	10.0	9.3
Glyphosate	8	10.0	10.0	10.0
SC 0224	2	8.3	9.0	8.0
SC 0224	4	10.0	10.0	9.3
SC 0224	8	10.0	10.0	9.7
Check	-	0.7	0.0	1.7

1/ Average of 3 replications where 0 = no effect and 10 = complete kill. Treated 10/1/82. Evaluation dates at top of table.

The effect of three postemergence herbicides on established bermudagrass. Edson, W. D. A heavy stand of bermudagrass was sprayed October 7, 1982. Certain plots were resprayed on October 28.

The initial effect indicates a great deal of activity of all herbicides and rates. The complete picture of control will be evaluated next spring. (425-10-502-4-83)

Herbicide	Lb/A	Average[1/] Bermudagrass Control
Fluazifop	1	9.0
Fluazifop	1+1	9.0
Fluazifop	2	9.3
Sethoxydim	1	8.3
Sethoxydim	1+1	8.7
Sethoxydim	2	9.3
Glyphosate	2	7.0
Glyphosate	4	8.7
Glyphosate	8	9.0
Check	-	2.7

1/ Average of 3 replications where 0 = no effect and 10 = complete kill. Treated 10/7/83 and 10/28/83. Evaluated 11/16/83.

A comparison of bermudagrass control with three postemergence herbicides. Edson, W. D. and A. H. Lange. A heavy stand of bermudagrass in a newly planted almond (close-planting) orchard was treated May 24, 1983 ie. 2-6 inch bermuda as well as a heavy infestation of crabgrass, lovegrass and cupgrass. The second application was made June 6. Both were made in 50 gpa.

The control of bermuda was excellent at the 1+1 rates of both fluazifop-butyl (Fusilade) and sethoxydim (Poast) and fair with Dow 4570. The annual grasses were completely controlled at all rates of all chemicals. (425-73-502-146-1-83).

The control of bermudagrass in young almonds (425-73-502-146-1-83).

Herbicides	Lb/A	Average[1/] Bermudagrass Control 7/5	8/31	10/20
Fluazifop-butyl	1/2+1/2	6.3	5.3	4.7
Fluazifop-butyl	1+1	8.3	7.0	9.0
Sethoxydim	1/2+1/2	7.3	5.7	7.7
Sethoxydim	1+1	7.0	7.0	8.7
Dow 4570	1/2+1/2	6.3	3.7	5.7
Dow 4570	1+1	7.0	4.7	7.0
Check	-	0.0	0.0	0.0

1/ Average of 3 replications where 0 = no control and 10 = no regrowth. Treated 5/24/83 and retreated 6/6/83. Evaluation dates noted at top of table.

The initial effect of two postemergence herbicides on the control of bermudagrass. Edson, W. D. and A. H. Lange. A heavy stand of bermudagrass was divided up and sprayed September 6, 1983 in 50 gpa of water.

The initial results favor the 1+1 fluazifop-butyl application as it indicates the best control; especially in the last evaluation. The single 2 Lb/A application was decidedly weak showing the most recovery. (425-54-502-108-1-83)

The initial effect of two postemergence herbicides on bermudagrass
(425-54-502-108-1-83)

Herbicide	Lb/A	Average[1/] Bermudagrass Control	
		10/6/83	10/27/83
Fluazifop-butyl	½+½	7.2	8.8
Fluazifop-butyl	1+1	8.0	9.0
Fluazifop-butyl	2	7.2	7.8
Sethoxydim	½+½	6.2	5.5
Sethoxydim	1+1	7.5	7.2
Sethoxydim	2	4.2	0.8
Check	-	0.8	0.0

1/ Average of 4 replications where 0 = no effect and 10 = complete weed control. Treated 9/6/83. Evaluation dats at top of table.

Oxyfluorfen application to almonds after February 15. Vargas, R. N. Cooperator: Delwin Moss. A study was conduted in a nine year old almond orchard to determine the phytotoxic effect, if any, when oxyfluorfen (Goal) was applied after the February 15 "cut-off" date.

The almonds were divided into two tree plots and replicated four times in a randomized block design. Application of the herbicides were made on May 5, 1983 at which time the almond trees had mature callused leaves. Bermudagrass, in a vegetative stage, was present on the berms.

As can be seen by the following table, no injury to the almond trees was observed at any of the rates tested. Bermudagrass control was not satisfactory. The paraquat (Ortho Paraquat CL*) treatments produced initial burning of the foliage but regrowth occurred within two weeks. The bermudagrass was not mature enough for effective results with glyphosate (Roundup). (425-20-501-146-4-83)

Herbicides	Lb/A	Average[1/] Bermudagrass Control			Average[2/] Phytotoxicity		
		5/11	5/16	5/23	5/14	5/16	5/23
Oxyfluorfen	1	0.0	3.5	2.8	0.0	0.0	0.0
Oxyfluorfen+Glyphosate	.5+.5	1.0	4.5	5.5	0.0	0.0	0.0
Oxyfluorfen+Glyphosate	1+.5	1.0	5.5	6.8	0.0	0.0	0.0
Oxyfluorfen+Paraquat	.5+.5	8.0	6.5	6.2	0.0	0.0	0.0
Oxyfluorfen+Paraquat	1+.5	8.0	6.8	6.0	0.0	0.0	0.0

1/ Average of 4 replications where 0 = no control and 10 = 100% control.
2/ Average of 4 replications where 0 = no effect and 10 = total death to tree.

Bermudagrass control in almonds. Vargas, R. N. Cooperator: Delwin Moss. An almond orchard in its ninth leaf was divided into one tree plots and replicated four times in a randomized block design. At the time of the first herbicide application, the bermudagrass was undisturbed and in a vegetative stage with no seedheads. Herbicides were applied in 25 glalons of water per acre on May 5, 1983 and the plots were retreated on May 23. There was no regrowth at the time of the second treatment. All treatments except glyphosate (Roundup) and SC 0224 contained Surfel at the rate of 1 quart per acre.

An evaluation on May 23, at the time of the second application, indicated 30 to 50 percent control with all materials except SC 0224 at 2 pounds per acre was giving 72% control. An evaluation on June 17 indicated unacceptable control with all materials, with control ranging from 20 to 67 percent. Sethoxydim (Poast) at both rates and SC 0224 at 2 pounds were giving the best control. A late evaluation on August 3 indicated that all materials were giving poor control of the bermudagrass. Bermudagrass regrowth was evident in all treatments.

It appears from this trial, that in order to obtain effective control of bermudagrass, much higher rates of these grass herbicides will be needed. (425-20-502-146-4-83)

Herbicides	Lb/A	Average[1/] Bermudagrass Control 5/23/83	6/17/83	8/3/83
Fluazifop	.6+.3	2.8	5.0	3.8
Fluazifop	.5+.5	4.5	5.5	4.2
Sethoxydim	.6+.3	5.0	7.0	4.0
Sethoxydim	.5+.5	5.5	6.8	2.8
CGA 82725	.6+.3	3.8	3.2	0.5
CGA 82725	.5+.5	3.0	3.2	0.2
Hoe 39866	.6+.3	5.3	2.0	0.2
Hoe 39866	.5+.5	3.5	2.5	0.2
Hoe 33171	.6+.3	3.5	4.0	0.5
Hoe 33171	.5+.5	3.5	4.5	1.0
SC 0224	1	5.8	5.5	2.0
SC 0224	2	7.2	8.0	6.0
Glyphosate	1	5.0	6.8	2.8
DPX Y6202	.125+.125		5.5	1.8
Check	-	0.0	0.0	0.0

1/ Average of 4 replications where 0 = no control and 10 = 100% control.

Bermudagrass control in almonds. Vargas, R. N. Cooperator: Delwin Moss. A nine year old almond orchard was divided into two tree plots and relicated four times in a randomized block design. Herbicide treatments were made in 25 gallons of water per acre on June 21, 1983 at which time the bermudagrass was 8-10 inches tall with seedheads. All treatments contained Surfel at the rate of 1 quart per acre.

An evaluation on June 28, seven days after application, indicated very good initial burn down with all rates of Hoe 39866. Glyphosate (Roundup) was giving 40 to 50 percent control. An evaluation on August 3 indicated 95 percent control of the bermudagrass with the 3 pound rate of glyphosate. The bermudagrass was regrowing in all of the Hoe 39866 plots indicating little systemic action with this material. (425-20-502-146-5-83)

Herbicides	Lb/A	Bermudagrass Control 1/ 6/28/83	8/3/83
Glyphosate	1.5	4.2	8.8
Glyphosate	3	5.5	9.5
Hoe 39866	1	7.8	4.8
Hoe 39866	2	8.8	6.2
Hoe 39866	3	9.0	6.2
Check	-	0.0	0.0

1/ Average of 4 replications where 0 = no control and 10 = 100% control.

The effect of a trifluralin-norflurazon combination on the control of bermudagrass. Lange, A. H. A heavy infestation of bermudagrass was tilled up to a depth of seven inches. Trifluralin (Treflan) was incorporated uniformly through all plots except an untreated check as close as possible to the row of newly planted trees. Norflurazon (Solicam) was applied on March 20, 1983 down the tree row and incorporated with spring rains beginning the day of treatment.

By the middle of summer all treatments were giving good weed control. The addition of norflurazon to trifluralin gave improved perennial weed control as seen with increasing rates. (425-73-502-100-1-83)

		Average[1/]			
		Yellow Nutsedge Control	Bermudagrass Control		Phyto-toxicity
Herbicide	Lb/A	7/9/83	7/9/83	10/16/83	10/16/83
Trifluralin+ Norflurazon	8+2	7.6	4.9	6.6	0.0
Trifluralin+ Norflurazon	8+4	10.0	7.1	9.2	0.0
Trifluralin+ Norflurazon	8+8	9.2	9.2	8.8	0.0
Check	-	2.5	0.0	2.0	0.0

1/ Average of 8 replications where 0 = no effect and 10 = complete control.

PERENNIAL WEED CONTROL - YELLOW NUTSEDGE

Nutsedge control in almonds. Vargas, R. N. An almond orchard in its fourth leaf was divided into one tree plots and replicated three times in a randomized block design. Yellow nutsedge 3 inches tall with 4-7 leaves was growing on the berm at the time of application. Application of the herbicides was made on April 19, 1983 with .3 inch of rainfall occurring within 6 hours after the application.

Observations indicated that the nutsedge in the metolachlor (Dual) treatments stopped growing and turned a dark green color. An evaluation on June 7 indicated 80 percent control but regrowth on August 3 indicated only 50 to 53 percent control. Glyphosate (Roundup) and SC 0224 gave poor control in this study.

It appears from this study that metolachlor has some promise for the control of yellow nutsedge in tree and vine crops.
(425-20-502-146-3-83)

Herbicides	Lb/A	Yellow Nutsedge Control 1/			
		5/4	5/21	6/7	8/3 2/
Glyphosate	3	3.6	3.0	0.0	0.0
SC 0224	3	3.0	3.0	0.0	0.0
Metolachlor	3	2.0	2.3	8.0	5.0
Metolachlor+Cal-90	3+1	2.0	2.6	8.0	5.3
Check	-	0.0	0.0	0.0	0.0

1/ Average of 3 replications where 0 = no control and 10 = 100% control.
2/ Dates of evaluation. Treated 4/19/83.

The control of yellow nutsedge with metolachlor. Edson, W. D. and A. H. Lange. Three rates of metolachlor (Dual) were sprayed on tilled Delhi loamy sand moderately infested with yellow nutsedge June 27, 1983. The treated soil was then power incorporated to 6 inches with a Howard tiller at 2 mph. The plots were 5 x 40 feet replicated 6 times. The incorporated herbicide gave excellent nutsedge control at all rates which appeared to last well into the fall. Since metolachlor does not usually last much over 2 months, we could conclude that control in midsummer may be adequate for the rest of the season.

More work is needed on the residual activity of metolachlor in light soils such as this Delhi loamy sand with only 0.3% organic matter and 85% sand. (425-73-502-100-2-83)

The effect of incorporated metolachlor on the control of yellow nutsedge (425-73-502-100-2-83)

Herbicide	Lb/A	Average[1/] Nutsedge Control 9/6	11/2
Metolachlor	2	8.9	7.0
Metolachlor	4	9.8	8.2
Metolachlor	8	10.0	9.8
Check	-	0.0	0.0

1/ Average of 6 replications where 0 = no control and 10 = complete control; i.e., no shoots of nutsedge present. Treated 6/27/83. Evaluation dates at top of table.

The postemergence control of yellow nutsedge. Lange, A. H. and J. May. A heavy stand of yellow nutsedge in drip irrigated berries was divided up into small plots and sprayed August 23, 1983. When rated Spetember 21, both herbicides showed good activity on nutsedge. The 1/2 Lb/A SC 1056 was a little too low. The 2 Lb/A rate gave better initial effects than 2 Lb/A of glyphosate. The activity on nutsedge was first observed in the 1983 herbicide screening trial 425-73-501-100-1-83. In that trial this herbicide appeared to be selectively safe to other broadleaf and grass weeds. Preemergence it was toxic to corn in other trials. (425-73-502-101-1-83)

The effect of postemergence herbicides on the control of yellow nutsedge (425-73-502-101-1-83)

Herbicides	Lb/A	Average[1/] Nutsedge Control 9/21/83	11/24/83
SC 1056	1/2	4.3	5.7
SC 1056	2	8.0	9.3
Glyphosate	2	7.0	8.0
Glyphosate	8	9.7	10.0
Check	-	0.0	1.7

1/ Average of 3 replications where 0 = no effect and 10 = complete kill of top growth. Treated 8/23/83.

PERENNIAL WEED CONTROL - BINDWEED

The effect of translocated herbicides on the control of well-established perennial bindweed in young almonds. Lange, A. H., W. D. Edson and K. F. Lange. A solid stand of perennial bindweed was sprayed on June 9,1982 with glyphosate (Roundup), SC 0224, SC 0545, AmHo 0661 and Pix. On June 15 glyphosate was applied to the Pix plots. On October 29 one set of glyphosate plots were sprayed and one set which had received no previous glyphosate, however, several inches of rain fell soon after application.

The results observed in May 1983 showed good control from all chemicals except AmHo 0661. Note the good control from the single fall application vs. the single spring application. However, the twice sprayed plot gave the best control, i.e., spring and fall (4+4).

By October 1983, however, the single fall application was very poor which may have been due to heavy rain following application. This observation needs to be reexamined since it is contrary to other work where fall applications have been the best.

The October evaluation was also after all plots had been sprayed by the grower with 4 pounds of glyphosate during the summer which included the previously untreated check. This summer treatment by the grower was not very effective unless the experimental plots were left unsprayed by him.

The spring Pix treatment followed by glyphosate is worthy of further evaluation as also are the new SC compounds which resemble glyphosate or may be slightly better. (425-50-502-146-1-82).

The long term effect of 1982 treatments on bindweed control (425-50-502-146-1-82).

Herbicides	Lb/A	Average[1/] Bindweed Control 5/4/83	10/4/83
Glyphosate	4	7.8	5.2
Glyphosate	8	9.2	8.2
SC 0224	4	9.0	8.2
SC 0545	4	10.0	8.5
AmHo 0661	4	0.8	1.2
Glyphosate+Pix	4+2½	8.5	7.8
Check	-	2.0	3.2
Glyphosate	4+4*	9.8	7.5
Glyphosate	4*(fall only)	8.5	1.0

1/ Average of 4 replications where 0 = no control and 10 = complete kill of bindweed. Treated 6/9/ and 10/29/82. Evaluation dates indicated at top of table.

* Plots sprayed 10/29/82 only.

The effect of spraying the bottom third of the foliage of young almond trees. Lange, A. H. and W. D. Edson. Young almond trees planted in 1982 were sprayed by covering the bottom third of the foliage with two rates of four herbicides and one rate of two other herbicides; one of which was glyphosate (Roundup). Each plot had one tree and two half guard trees. Only the middle data trees were measured and rated.

AmHo 0661 gave substantial phytotoxicity to the foliage and stems, however, this injury did not effect the increase in growth made in 1983. None of the herbicides caused detrimental effects after one year of a massive application to the foliage. These herbicides are not to be used in this manner, but it is important to know something of the margin of safety if ever misused or if carried in a spray drift to the lower foliage and trunk. (425-73-502-146-2-83)

The effect of simulated misapplication of six new postemergence herbicides on the growth of two almond varieties. (425-73-502-146-2-83)

		Average Increase[1/]		
Herbicides	lb/A	NonPareil	Carmel	Average of two varieties[2/]
Glyphosate	4	1.4	1.1	1.24
Sethoxydim	2+2	1.3	1.3	1.29
Sethoxydim	4	1.4	1.2	1.31
Fluazifop-butyl	2+2	1.3	1.6	1.44
Fluazifop-butyl	4	1.4	1.2	1.32
AmHo 0661	2+2	1.5	1.5	1.49
AmHo 0661	4	1.5	1.4	1.45
Dow 4570	2+2	1.3	1.4	1.35
Dow 4570	4	1.6	1.5	1.53
SC 1084	2+2	1.3	1.9	1.57
Check	-	1.4	1.1	1.25

1/ Average measurement of tree trunks 1983 measurement over the 1982 measurement.
Diameters taken to nearest 1/4 cm on 9/7/82.
Diameters taken to nearest 1/2 cm on 10/16/83.
2/ Total is of both NonPareil and Carmel combined.

CHEMICAL INDEX

Chemical Name	Common Name	Page No.
Agridex		12,14
AmHo 0661		4-8,37,38
Caliber 90		12,13,34
CGA 82725		31
Dow 4570		21-23,28,38
DPX Y6202		31
EL 500		3-9
Fluazifop-butyl	Fusilade	1,3-8,21-23,26-29,31,38
Glyphosate	Roundup	12,26,27,30-32,34,36-38
Hoe 33171		31
Hoe 39866		31,32
Metolachlor	Dual	3,5-8,34,35
Napropamide	Devrinol	10-15,19,24
NC 28260		26
Norflurazon	Solicam	10,12,13,25,33
Oryzalin	Surflan	1,10-15,19,20,24
Oxyfluorfen	Goal	3,5-8,10-17,19,20,30
Pace (surfactant)		5-8,26
Paraquat	Ortho Paraquat CL	5-8,10,12-14,16,17,30
Pendimethalin	Prowl	1,5-8,12,13
Pix		37
PP 333		3-9
PPG 1721		3-9
Prodiamine	Rydex	1,3,5-8
R 40244	Racer	1,3-8,10-24
RH 0265		4-8
SC 0224		3-8,10-24,26,31,34,37
SC 0545		37
SC 1056		3-8,36
SC 1084		22,23,38
Sethoxydim	Poast	1,3-8,21-23,26-29,31-38
Simazine	Princep	1,5-11,14,15,19,20
Terbutryne	Igran	1
Trifluralin	Treflan	18,24,33
Triton Ag98 (surfactant)		14
X-77 (surfactant)		13

PESTICIDE USE WARNING - READ THE LABEL

Pesticides are poisonous and must be used with caution. READ the label CAREFULLY BEFORE opening a container. Precautions and directions MUST be followed exactly. Special protective equipment as indicated must be used.

STORAGE: Keep all pesticides in original containers only. Store separately in a locked shed or area. Keep all pesticides out of the reach of children, unauthorized personnel, pets and livestock. DO NOT STORE with foods, feeds or fertilizers. Post warning signs on pesticide storage areas.

USE: The suggestions given in this publication are based upon best current information. FOLLOW DIRECTIONS! Measure accurately to avoid residues exceeding tolerances, use exact amounts as indicated on the label or lesser amounts given in this publication. Use a pesticide only on crops, plants or animals shown on the label.

CONTAINER DISPOSAL: Consult your county Agricultural Commissioner for correct procedures for rinsing and disposing of empty containers. Do not transport pesticides in vehicles with foods, feeds, clothing or other materials and never in a closed cab with the vehicle driver.

RESPONSIBILITY: The GROWER is legally responsible for proper use of pesticides including drift to other crops of properties, and for excessive residues. Pesticides should not be applied over streams, rivers, ponds, lakes, run-off irrigation or other aquatic areas except where specific use for that purpose is intended.

BENEFICIAL INSECTS: Many pesticides are highly toxic to honey bees and other beneficial insects. The farmer, the beekeeper and the pest control industry should cooperate closely to keep losses of beneficial species to a minimum.

PROCESSED CROPS: Some processors will not accept a crop treated with certain chemicals. If your crop is going to a processor, be sure to check with the processor before making a pesticide application.

POSTING TREATED FIELDS: When worker safety re-entry intervals are established, be sure to keep workers out and post the treated areas with signs when required indicating the safe re-entry date.

PERMIT REQUIREMENTS: Many pesticides require a permit from the County Agricultural Commissioner before possession or use. Such compounds mentioned in this publication are marked with an asterisk (*).

PLANT INJURY: Certain chemicals may cause injury or give less than optimum pest control if used:

- at the wrong stage of plant development.
- in certain soil types.

- when temperatures are too high or too low.
- at excessive rates.
- when incompatible materials.
- at the wrong formulation.

PERSONAL SAFETY: Follow label directions exactly. Avoid splashing, spilling leaks, spray drift or clothing contamination. Do NOT eat, smoke, drink or chew while using pesticies. Provide for emergency medical care in advance.

A PROGRESS REPORT

To simplify the information, it is sometimes necessary to use trade names of products or equipment. No endorsement of named products is intended nor is criticism implied of similar products not mentioned.

The conclusions drawn from this work should not be used as recommendations. General recommendations for weed control in crops must be based on a very large number of field experiments conducted in all of the soil types under all of the irrigation practices, and in all of the seasons where the crop is normally grown, and under all the planting dates when grown in California, and for all the varieties used, as well as quality of the end product of the many products produced from this crop.

By including this written report with the previous work published and the future work yet to be done, we expect eventually to develop recommendations for weed control in several crops. In the interest of having this report available for use for next year's work, this report has had limited review. Any mistakes or questions should be directed to the Senior Author.

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