84-P9

WEED CONTROL IN ALMONDS FOR 1984

A. H. Lange, R. N. Vargas, W. D. Edson
University of California Cooperative Extension, Parlier, CA

Introduction

Our objectives have been: (1) to evaluate safe, economic preemergence and postemergence herbicides for annual weed control in almonds; (2) to develop an effective perennial weed control program using both herbicides and cultural practices; and (3) to investigate the long term use of herbicides on almond growth and yield under chemical strip and complete nontillage.

Several new preemergence herbicides will be useful for annual and perennial weed control in almonds when registered. Prodiamine is very safe for use in trees and vines. It controls a broad spectrum of weeds including all annual grasses tested and many broadleaf weeds. It is not very effective on flaxleaved fleabane and marestail. Continuous use of prodiamine will help control bermudagrass, johnsongrass and bindweed. Pendimethalin is similar to oryzalin but not as residual. Terbutryne is much safer than simazine on almonds and should be tested in the lighter soils where simazine use is not recommended. R 40244 is similar to norflurazon having considerable activity on nutsedge and bermudagrass as well as most grasses and many broadleaf weeds.

There are several good postemergence herbicides coming on the market. Fluazifop-butyl is a new grass herbicide that is very effective on nearly all grasses. It appears to be very effective on johnsongrass and bermudagrass. There is a lot to learn about these new grass killers but 1984 results suggest it may give more lasting control of perennial grasses (especially bermudagrass) than glyphosate. Fluazifop-butyl is now registered for nonbearing almonds and the residue work for bearing almonds is apparently complete. Sethoxydim is similar to fluazifop-butyl. It seems to be more active on most annual grasses and johnsongrass. Sethoxydim is somewhat effective on bermudagrass but not quite as good as fluazifop-butyl. Sethoxydim is also registered on nonbearing almonds. The residue work should be complete in 1984. Other effective grass herbicides being studied but not yet registered include Verdict, Whip, Assure and SC 1084.

Our long term studies show equal yields for strip and complete chemical nontillage, both having much better yield than where tillage was used for controlling weeds. Strip weed control with mowing the centers gave lower yields than where herbicides were used in our 1984 UC Kearney results. However, in 1983 the opposite was true and larger scale grower trial this year showed a definite decrease in growth and yield where chemicals were used for weed control during the past three years compared to mowed centers.

The effect of eight preemergence herbicides on weed control and young tree growth. Lange, A. H. and W. D. Edson. Young newly planted fruit trees in their second leaf were sprayed in small plots March 16, 1984 in 10 ft by 16 ft and 10 ft by 8 ft sized areas around the based of the tree. The mixed varieties of almonds were replicated only one time, the early O'Henry peaches were replicated two times, the Durado plum were replicated two times, the Malling 110 apples were replicated three times and the seedling apricot trees were replicated two times. The temperatures were 70-75°F and it rained the night of application. The results of these new preemergence herbicides proved the safety of these herbicides on young newly planted trees. They also point out the value of having a large number of herbicides registered for use in trees. Simazine was outstanding for the control of broadleaf weeds except puncturevine. Terbacil was weak on pigweed but was excellent on early grass control and puncturevine control. Diuron usually quite effective, was very weak on all weed species, but relatively safe on all crop species in this test. (425-73-501-1-84)

Table 1. The effect of preemergence herbicides on the growth of young trees (425-73-501-1-84)

		Average[1/]			
Herbicides	Lb/A	Almond Peach	Apricot	Plum	Apple
Simazine	2	9.0	9.0	9.5	8.7
Terbacil	2	9.7	10.0	9.5	10.0
Diuron	2	8.0	10.0	9.0	8.7
Terbacil+Diuron	1+1	9.0	8.5	9.0	9.7
Terbutryne	4	10.0	9.0	10.0	8.0
Metolachlor	4	8.0	10.0	8.0	10.0
Terbutryne+Metolachlor	2+2	8.0	10.0	10.0	9.7
R 40244	2	9.7	10.0	9.0	10.0
Mon 097	4	9.0	8.5	9.0	9.0
Check	-	8.3	9.5	4.5	8.3

1/ Average of 3 replications where 0 = tree dead and 10 = vigorous tree growth. Treated 3/16/84. Evaluated 6/28/84.

Table 2. The phytotoxic effects of preemergence herbicides on the growth of young trees (425-73-501-1-84)

Herbicides	Lb/A	Average Phyto[1/]			
		Almond-Peach	Apricot	Plum	Apple
Simazine	2	0.0	1.5	5.0	1.0
Terbacil	2	1.0	0.0	3.0	2.7
Diuron	2	0.0	0.0	3.0	1.3
Terbacil+Diuron	1+1	0.0	0.0	2.5	0.7
Terbutryne	4	2.3	0.0	2.5	0.7
Metolachlor	4	1.7	0.0	0.0	0.3
Terbutryne+Metolachlor	2+2	2.0	5.0	2.0	0.3
R 40244	2	0.0	2.5	2.0	0.0
Mon 097	4	1.3	0.0	2.5	1.0
Check	-	0.0	0.0	2.0	1.0

1/ Average of 2-3 replications where 0 = no phytotoxicity symptoms and 10 = trees dead. Treated 3/16/84. Evaluated 6/13/84.

Table 3. The effect of preemergence herbicides on the control of weeds at 3 months after treatment (425-73-501-1-84).

Herbicides	Lb/A	Average Weed Control[1/]		
		Grass	Broadleaf	Nutsedge
Simazine	2	4.4	8.2	7.9
Terbacil	2	8.4	8.6	9.3
Diuron	2	5.4	6.9	7.8
Terbacil+Diruon	1+1	7.4	7.9	9.1
Terbutryne	4	4.7	6.4	6.3
Metolachlor	4	6.1	6.1	9.9
Terbutryne+Metolachlor	2+2	6.4	6.8	8.7
R 40244	2	8.2	9.8	8.6
Mon 097	4	5.9	9.3	8.9
Check	-	1.3	1.1	4.8

1/ Average of 7-10 replications where 0 = no control and 10 = complete control of weeds. Treated 3/16/84. Evaluated 6/13/84.

Table 4. The effect of spring applied preemergence herbicides on the control of weeds at about 3½ months after treatment (425-73-501-1-84)

Herbicides	Lb/A	Average Weed Control[1/] Pig-weed	Water-grass	Puncture-vine
Simazine	2	8.6	4.3	5.8
Terbacil	2	9.1	8.9	10.0
Diuron	2	6.6	4.4	7.5
Terbacil+Diuron	1+1	9.3	7.8	8.5
Terbutryne	4	5.8	4.3	7.5
Metolachlor	4	5.3	5.5	3.8
Terbutryne+Metolachlor	2+2	6.1	6.1	7.0
R 40244	2	9.9	8.5	10.0
Mon 097	4	8.7	5.3	8.8
Check	-	2.4	2.4	8.5

1/ Average of 6-12 replications where 0 = no control and 10 = complete control of weeds. Treated 3/16/84. Evaluated 6/28/84.

Annual weed control in almonds. Vargas, R. N. and D. Schnoor. Two almond orchards, one in the 4th leaf and the other in the 7th leaf were divided into two tree plots and replicated four times in a randomized block design. Both trial areas were treated for the second time during mid-November of 1983. Paraquat and X-77 were added plots with emerged weeds present. The herbicides were appplied in 50 gallons of water per acre with 8002 flat fan nozzles. The orchards are growing on Traver sandy loam soil under flood irrigation.

As can be seen in both trial areas the herbicide treatments were giving excellent control. Weed pressure was heavy in the 4th year (Table 1) orchard with shepherdspurse, chickweed, sowthistle, mustard, prickly lettuce, common groundsel, redsmaid and pineapple weed all being present in the check plot. Evaluations on March 21 and May 30 indicated good to excellent control with most materials. The evaluation on May 30 reflects marestail control. Norflurazon at the 2 Lb/A rate was somewhat weak in this trial.

Table 1. Preemergence almond weed control

Herbicides	Lb/A	Average[1/] Weed Control 3/21/84	5/30/84
Simazine	.5	9.0	9.2
Simazine	1	9.2	9.5
Norflurazon	2	8.0	6.8
Norflurazon	4	8.5	8.5
Oxyfluorfen	1.5	9.3	8.0
Pendimethalin	4	8.0	8.5
Simazine+Norflurazon	.5+2	9.5	9.8
Simazine+Pendimethalin	.5+4	10.0	10.0
Pendimethalin+Oxyfluorfen	4+1.5	9.5	9.5
Norflurazon+Oryzalin	2+4	9.8	9.2
Norflurazon+Napropamide	2+4	9.0	8.2
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.

Table 2. Preemergence almond weed control

Herbicides[1/]	Lb/A	Average[2/] Winter Weed Control
Simazine	1	10.0
Pendimethalin	4	8.8
Norflurazon	2	9.0
Norflurazon	4	8.8
Oxyfluorfen	1.5	8.5
Simazine+Napropamide	1+4	10.0
Simazine+Oryzalin	1+4	9.8
Pendimethalin+Oxyfluorfen	4+1.5	10.0
Oxyfluorfen+Norflurazon	1.5+2	9.8
Simazine+Norflurazon	1+2	10.0
Napropamide	4	8.5
Oryzalin	4	9.5
Check	-	4.0

1/ All plots received Paraquat+X-77, .5+.25%.
2/ Average of 4 replications where 0 = no control and 10 = 100 percent control.

Annual weed control in almonds. Vargas, R. N. and R. Leach. A mature almond orchard growing on a Grangeville fine sandy loam soil under flood irrigation was treated for the fourth consecutive year. Dates of treatments were December 16, 1980, November 20, 1981, December 10, 1982 and Novmber 23, 1983. Paraquat at .5 pound plus .25% X-77 were added to all treatments to kill the existing seedling chickweed, filaree and common groundsel. The herbicide applications were made in 50 gallon of water per treated acre.

An evaluation on November 23, 1983, twelve months after the previous year's application, indicated 80 to 85 percent control of filaree with oxyfluorfen alone and in combination with napropamide and oryzalin. The evaluation for winter annual weeds on March 21, 1984 indicated acceptable control with most materials, Simazine at the 1 pound rate was weak as was oryzalin and napropamide by themself. Redstem and whitestem filaree were the main weed species present. A paraquat application was made the first of April to all plots. An evaluation on May 21, 1984 again indicated acceptable control with all materials except the 1 pound rate of simazine and simazine plus oryzalin. Black mustard and filaree were the main weed species present.

Preemergence almond weed control

		Average Weed Control[2/]		
		Chickweed Filaree	Winter Annuals	
Herbicides[1/]	Lb/A	11/23/83	3/21/84	5/21/84
Simazine	1	3.5	6.5	4.5
Simazine	2	6.0	9.0	7.0
Napropamide	4	2.3	3.5	9.5
Oryzalin	4	5.3	7.0	9.3
Oxyfluorfen	2	7.5	8.3	9.3
Oxyfluorfen	1	6.3	7.2	9.5
Simazine+Napropamide	1+4	3.5	7.5	9.3
Simazine+Oryzalin	1+4	6.8	7.5	4.0
Simazine+Oxyfluorfen	1+2	7.8	9.8	10.0
Oryzalin	6	4.5	6.0	8.8
Oxyfluorfen+Napropamide	2+4	8.0	9.0	9.5
Oxyfluorfen+Oryzalin	2+4	8.5	9.8	9.8
Oxyfluorfen	2	8.0	8.0	10.0
Check	-	4.0	0.0	10.0

1/ All plots received paraquat + X-77, .5 + .25%.
2/ Average of 4 replications where 0 = no control and 10 = 100 percent control.

Annual weed control in almonds. Vargas, R. N. and R. Cavaletto. A first year study was established in a fourth year almond orchard growing on a Madera/Lewis sandy loam soil under flood irrigation. One objective of the test was to test a herbicide safener, WL-82026, with simazine to determine safety on younger trees. The herbicide treatments were made in 50 gallons of water per acre on November 22, 1983 with paraquat and X-77 being added at the rate of .5 pounds and .25% to kill existing seedlings.

As can be seen by an evaluation on March 21, 1984 weed pressure was low. All materials were giving excellent control. Pendimethalin at 4 pounds was giving poor control with common groundsel being the only weed present in that treatment.

An evaluation of phytotoxicity in late summer indicated no injury symptoms with any treatment. Control and crop vigor were excellent with or without the WL-82026 material.

Preemergence almond weed control

Herbicides[1/]	Lb/A	Average[2/] Weed Control
Simazine	2	10.0
Oxyfluorfen	1.5	9.5
Norflurazon	2	7.8
Simazine+Pronamide	1.5+1.5	10.0
Oxyfluorfen+Pronamide	1.5+1.5	10.0
Simazine+Oryzalin	1.5+4	10.0
Oxyfluorfen+Oryzalin	1.5+4	9.8
Simazine+WL-82026	2+.5 gal	10.0
Simazine+WL-82026	1+1 gal	10.0
Simazine+WL-82026	2+2 gal	10.0
Pendimethalin	4	6.5
Pendimethalin+Oxyfluorfen	4+1.5	9.8
AC-263-499	.25	9.3
AC-263-499	.5	9.8
Check	-	6.0

1/ All plots received paraquat+X-77, .5+.25%.
2/ Average of 4 replications where 0 = no control and 10 = 100 percent control.

The long term effect of nontillage chemical weed control culture on the yield of almonds. Vargas, R. N., K. F. Lange, D. Schnoor and W. D. Edson. A seven year old bearing almond orchard was set so as to compare two methods of nontillage weed control; chemical strip with mowed centers vs. complete chemical weed control. A combination of simazine, oxyfluorfen and oryzalin were applied annually starting in the spring of 1981. After 4 years of this culture harvest yields were taken. In the fall of 1984 the growers standard practice of mowing the centers yielded 514 more pounds of nuts but 49 less pound of neats. The complete chemical treated trees appeared small and were more easily harvested; i.e., they were shook free of nuts. They would be expected to have less meats but they apparently had slightly more.

While this work shows relatively small differences if the future yield data continues to show the same trend the differences will indicate an important effect probably resulting from reduced water penetration. If consistent the gain of 49 pounds of almond meats could be significant. (425-20-501-146-1-81)

The effect of cultural practice on almond yield
(425-20-501-146-1-81)

Treatment	Average[1/] Total pounds per acre	Pounds of meats per acre
Chemical strip mowed centers	7095	1844
Complete chemical	6581	1908

1/ Average of 4 replications with 7-20 trees per replication.

The effect of six preemergence herbicides on the control of three annual broadleaf weeds. Edson, W. D. and A. H. Lange. Small two tree plots were treated March 16, 1984 with six preemergence treatments. The soil was a Delhi loamy sand with about 0.2 percent organic matter. The plots were furrow irrigated beginning March 20. The herbicides were applied with a 3-nozzle boom at 10 psi using 8004 LP tips.

The weed control ratings clearly indicate the excellent broad spectrum annual weed control with R 40244. In this extremely sandy soil, it did not appear to control yellow nutsedge as is usually the case. Terbutryne was fairly effective compared to simazine. Terbacil was also quite effective on most weed species. There was essentially no effect of these herbicides on the growth of these young trees. (425-73-501-115-3-84)

Table 1. The effect of spring applied preemergence herbicides on summer weed control (425-73-501-115-3-84)

		Average Weed Control[1/]		
Herbicides	Lb/A	Flaxleaved Fleabane	Sow-thistle	Evening Primrose
Simazine	2	6.2	9.2	4.2
Terbacil	2	7.2	7.5	6.2
Diuron	2	3.5	7.5	3.8
Terbacil+Diuron	1+1	2.0	3.8	2.2
Terbutryne	2	6.2	6.2	7.5
R 40244	2	8.8	8.8	8.5
Check	-	0.0	3.2	2.5

1/ Average of 4 replications where 0 = no weed control and 10 = all weeds dead. Treated 3/16/84. Evaluated 6/29/84.

Table 2. The effect of preemergence herbicides on the growth of young trees and yellow nutsedge control (425-73-501-115-3-84)

Herbicide	Lb/A	Average[1/] Tree Vigor	Average[1/] Yellow Nutsedge Control
Simazine	2	8.8	1.7
Terbacil	2	9.5	2.5
Diuron	2	9.2	3.5
Terbacil+Diuron	1+1	9.8	6.2
Terbutryne	2	9.0	4.2
R 40244	2	9.0	4.7
Check	-	9.2	1.0

1/ Average of 4 replications where 0 = no tree growth or no weed control and 10 = best growth and best weed control. Evaluated 10/5/84.

The effect of two preemergence herbicide combinations on tree vigor. Lange, A. H. and K. F. Lange. Young newly planted stone fruit trees were treated with combinations of herbicides at several rates on February 14, 1984. The soil was a Delhi loamy sand with about 0.2 percent organic matter. The early annual weeds were not rated but most herbicide combinations gave excellent season long weed control. Bermudagrass was not heavy throughout the trial. There appeared to be some effect on bermudagrass paralleling the increasing rates.

There was also some indication of reduced vigor with increasing rates of R 40244 but the combination showed no increased or additional detrimental effects. (425-73-501-115-4-84)

The effect of preemergence combinations on the control of bermudagrass and tree vigor (425-73-501-115-4-84)

Herbicide	Lb/A	Average[1/] Bermudagrass Control	Average[1/] Tree Vigor
Napropamide	4	6.0	4.5
Napropamide	8	9.2	7.0
Napropamide+R 40244	4+1	7.3	7.8
Napropamide+R 40244	4+2	8.7	6.2
Napropamide+R 40244	4+4	9.2	6.5
R 40244	1	6.7	6.7
R 40244	2	9.2	4.6
R 40244	4	8.3	5.2
Check	-	8.3	5.8

1/ Average of 6 replications where 0 = no control or no growth and 10 = no bermudagrass or most vigorous tree growth. Evaluated 10/5/84.

The effect of three preemergence herbicides on the control of yellow nutsedge. Edson, W. D. and A. H. Lange. A heavy stand of yellow nutsedge was rototilled and the herbicides sprayed June 6, 1984. Two days later (June 8) these herbicides were incorporated with sprinklers with 1/2 acre inch of water. The soil was a Hanford sandy loam with about 0.8 O.M. On August 2, the control was evaluated. All herbicides gave a degree of nutsedge control, but metolachlor appeared best for both yellow nutsedge and annual grasses (mostly lovegrass and crabgrass). (425-73-502-146-3-84)

The effect of three preemergence herbicides on the control of nutsedge and annual grasses (425-73-502-146-3-84)

Herbicides	Lb/A	Average Control[1/] Yellow Nutsedge	Annual Grasses
Metolachlor	2	8.1	7.0
Metolachlor	4	8.3	8.2
Metolachlor	8	9.5	9.0
Mon 097	2	6.5	4.5
Mon 097	4	6.3	7.8
Mon 097	8	8.0	8.5
Alachlor	2	8.2	4.8
Alachlor	4	4.7	4.5
Alachlor	8	6.3	7.0
Check	-	4.8	3.0

1/ Avergae of 3 replications where 0 = no control and 10 = total kill of weeds. Treated 6/6/84. Evaluated 8/2/84.

Controlling yellow nutsedge through drip irrigation. Lange, A. H. and W. D. Edson. A heavy stand of yellow nutsedge in a foot wide basin irrigated nursery crop was treated by diluting two herbicides with the water for incorporation and injecting this diluted preemergence herbicides through a T-tape drip system with 6 inch spacing. Two drip lines were used one on either side of the nursery row. The herbicides were injected in 1/2 and 1 acre inch of water on March 20, 1984. The nutsedge had been knocked down with glyphosate by the grower. The day of application was sunny with temperatures at about 72-78°F and no wind. The plots were rated for nutsedge control on April 18, May 8, May 23, June 15 and September 19.

The control was spectacularly good when one considers that the application was made only once early in the season. Repeated applications, if safe, would be expected to give better nutsedge control. The norflurazon gave significant control, but never quite matched the metolachlor. The later seemed to give season long nutsedge control. The combination was not outstanding but gave a degree of control. (425-54-502-129-1-84)

The effect of two preemergence herbicides applied through the drippers on yellow nutsedge control (425-54-502-129-1-84)

Herbicides	Lb/A	Acre Inch[1/]	Average[1/] Yellow Nutsedge Control 4/18	5/8	5/23	6/15	9/19
Metolachlor	2	1/2	9.5	8.8	8.5	8.5	9.8
Metolachlor	4	1	10.0	10.0	9.5	9.5	9.2
Norflurazon	2	1/2	8.2	8.0	8.3	7.8	8.0
Norflurazon	4	1	8.5	9.2	8.8	7.8	8.8
Metolachlor+ Norflurazon	2+2		8.5	8.2	8.8	7.5	6.5
Check			4.0	2.2	0.0	0.0	3.5

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

The effect of five preemergence on the control of weeds in almonds, pears and grapes. Edson, W. D. and A. H. Lange. Young trees and vines in their second leaf were replanted in the spring of 1984 and treated March 16, 1984 with five preemergence herbicides in 50 gallons per acre of water. Both prodiamine and pendimethalin were comparable to oryzalin in weed control and safety to almond, pear and grape. Mon 097 and metolachlor were comparable except metolachlor at 16 Lb/A appeared to cause stunting in pears. It appeared to be safe in almonds and grapes. (425-73-501-2-83)

Table 1. The effect of spring applied preemergence herbicides on almond tree growth and subsequent weed control (425-73-501-2-84)

Herbicides	Lb/A	Almond[1/] Vigor	Average Weed Control[1/] Pigweed	Watergrass
Oryzalin	8	10.0	10.0	9.7
Pendimethalin	8	9.3	9.7	10.0
Prodiamine	8	9.3	10.0	10.0
Mon 097	8	10.0	10.0	9.7
Mon 097	16	8.7	10.0	10.0
Metolachlor	8	10.0	9.0	10.0
Metolachlor	16	10.0	10.0	10.0
Check	-	6.3	4.7	5.7

1/ Average of 3 replications where 0 = almond tree dead or no weed control and 10 = almond tree growing vigorously or all weeds dead. Treated 3/16/84. Evaluated 6/28/84.

Table 2. The effect of spring applied preemergence herbicides on tree growth and subsequent weed control (425-73-501-2-84)

Herbicides	Lb/A	Almond[1/] Phyto	Average Weed Control[1/] Grass	Broadleaf	Nutsedge	Overall
Oryzalin	8	2.0	9.7	10.0	9.3	9.3
Pendimethalin	8	1.7	10.0	9.7	8.3	9.0
Prodiamine	8	0.7	10.0	10.0	9.3	9.3
Mon 097	8	0.0	9.7	10.0	10.0	9.7
Mon 097	16	1.7	10.0	10.0	10.0	10.0
Metolachlor	8	1.0	10.0	8.7	10.0	9.0
Metolachlor	16	1.7	10.0	10.0	10.0	10.0
Check	-	0.7	5.3	5.3	5.8	5.0

1/ Average of 3 replications where 0 = no phytotoxicity symptoms or no weed control and 10 = almond tree dead or all weeds dead. Treated 3/16/84. Evaluated 6/13/84.

Table 3. The effect of spring applied preemergence herbicides on tree growth and subsequent weed control (425-73-501-2-84)

Herbicides	Lb/A	Pear[1/] Vigor	Average Weed Control[1/] Pigweed	Watergrass
Oryzalin	8	8.5	-	10.0
Pendimethalin	8	9.5	9.5	10.0
Prodiamine	8	9.5	9.5	10.0
Mon 097	8	10.0	9.5	8.5
Mon 097	16	9.0	9.0	8.0
Metolachlor	8	9.5	9.0	8.5
Metolachlor	16	5.0	10.0	9.5
Check	-	8.0	0.0	0.0

1/ Average of 2 replications where 0 = pear tree dead or no weed control and 10 = pear tree growing vigorously or all weeds dead. Treated 3/16/84. Evaluated 6/28/84.

Table 4. The effect of spring applied preemergence herbicides on vine growth and subsequent weed control (425-73-501-2-84)

Herbicides	Lb/A	Grape[1/] Vigor	Average Weed Control[1/] Pigweed	Watergrass	Spurge
Oryzalin	8	9.0	9.7	10.0	10.0
Pendimethalin	8	10.0	10.0	10.0	10.0
Prodiamine	8	9.0	9.3	9.7	10.0
Mon 097	8	10.0*	10.0	10.0	10.0
Mon 097	16	10.0*	10.0	9.3	10.0*
Metolachlor	8	9.7	10.0	10.0	10.0
Metolachlor	16	9.7	10.0	10.0	10.0
Check	-	6.7	3.0	9.3	6.7

1/ Average of 3 replications (* = 2 reps.) where 0 = grape vines dead or no weed control and 10 = best grape growth or all weeds dead. Treated 3/16/84. Evaluated 6/28/84.

The effect of two acitamides on the control of yellow nutsedge. Edson, W. D. A heavy infestation of yellow nutsedge was tilled in two directions. The herbicides were applied June 22, 1984 in 50 gallons per acre of water. On October 4 the regrowth ratings indicated only partial control. The new herbicide did not appear to be as residual as metolachlor. The grass control, however, appeared to be considerably better. (425-73-502-146-5-84)

A comparison of two preplant incorporated herbicides on the control of yellow nutsedge and crabgrass (425-73-502-146-5-84)

Herbicide	Lb/A	Average[1/] Yellow Nutsedge	Crabgrass
SC 1102	2	0.0	8.3
SC 1102	4	0.3	6.7
SC 1102	8	1.7	8.7
Metolachlor	2	3.3	4.3
Check	-	0.0	3.3

1/ Average of 3 replications (i.e., 10'x 10') where 0 = no effect and 10 = complete eradication, no regrowth. Evaluated 10/4/84.

A comparison of postemergence herbicides for johnsongrass control. Edson W. D. and A. H. Lange. A heavy stand of johnsongrass on a raised berm was divided up into 5 by 16 ft plots and sprayed with postemergence herbicides in 100 gpa of water (because of the heavy stand) on April 27, 1984. In addition to the treatment applied April 27, the grower had previously sprayed with 1/2 Lb/A of fluazifop-butyl in 30 gpa. On May 22 the second application of fluazifop-butyl and sethoxydim were applied, i.e., almost one month after the first treatment. On July 3 the plots were rated for control an again on October 10. The ratings show clearly superior johnsongrass control from the repeat application of fluazifop-butyl and sethoxydim. (425-54-502-108-1-84)

A comparison of postemergence herbicides for johnsongrass control (425-54-502-108-1-84)

Herbicides	Lb/A	Average[1/] Johnsongrass Control 7/3	10/10
Sethoxydim+Pace	½+½	6.7	4.2
Sethoxydim+Pace	1+1	6.7	3.8
Fluazifop+Pace	½+½	6.7	5.0
Fluazifop+Pace	1+1	6.7	6.0
Glyphosate	2	2.7	0.5
Glyphosate	4	2.2	0.5
SC 0224	4	2.5	0.8
Check	-	2.7	0.0

1/ Average of 4 replications where 0 = no control and 10 = complete control of weeds. Treated 4/27 and 5/22/84. Evaluation dates at top of table.

The effect of four postemergence herbicides on young almond trees and weeds when applied over the top. Edson, W. D. and A. H. Lange. Young trees heavily infested with annual weeds (pigweed, lambsquarter - 4-12 inches tall and lovegrass - 4-16 inches tall starting to go to seed) were sprayed with three postemergence herbicides including 1 percent Pace on May 21, 1984. The second applications were made June 5 also in 50 gallons per acre of water.

The results rated June 5 showed no effect on trees sprayed over the top or broadleaves. On the other hand, the grasses were controlled best with sethoxydim and AmHo 0664. (425-73-501-146-2-84)

The effect of four postemergence herbicides on young almond trees and weeds when applied over the top (425-73-501-146-2-84).

Herbicides	Lb/A	Average[1/] Tree Phyto	Average Control[1/] Grass	Broad-leaves
Fluazifop-butyl	1+1	1.3	7.7	0.0
Sethoxydim	1+1	0.0	9.3	0.0
SC 1084	½+½	0.0	6.7	0.0
SC 1084	1+1	0.0	5.3	0.0
Am Ho 0664	½+½	1.7	9.0	0.0
Am Ho 0664	1+1	0.3	7.3	0.0
Check	-	0.0	0.0	0.0

1/ Average of 3 replications where 0 = no phytotoxicity symptoms or no weed control and 10 = trees dead or total weed control. Evaluated 6/5/84.

The effect of preemergence and postemergence herbicides on the control of yellow nutsedge and bermudagrass. Lange, A. H. and W. D. Edson. A heavy stand of yellow nutsedge and bermudagrass (6 to 12 in) were sprayed May 24, 1984 and again on June 7. The area was periodically furrow irrigated. The early results showed partial control of bermudagrass. Fluazifop-butyl (Fusilade) showed excellent activity on bermudagrass but no activity on nutsedge or broadleaf weeds. SC 1084 and AmHo 0664 showed good early effects. Even PPG 1013 showed excellent early bermudagrass control but was outstanding on yellow nutsedge and broadleaf weeds (Table 1). In a later reading (Table 2) fluazifop-butyl and SC 1084 showed good results on bermudagrass. The PPG 1013 continued to look good on nutsedge. The AmHo 0664 didn't have much nutsedge but the bermudagrass was so thick that it may have screened out the nutsedge.

A later trial with much lower rates showed some early effects but not enough to be significant (Table 3). Therefore, the effective level of PPG 1013 is in the range of 1/2 pound per acre repeated as in the first trial.

Table 1. The effect of the directed sprays on the control of well established bermudagrass, yellow nutsedge and several broadleaf weeds in young trees (425-73-502-146-2-84)

		Average Weed Control[1/]		
Herbicides	Lb/A	Bermuda-grass	Yellow Nutsedge	Broadleaf Weeds
Fluazifop-butyl	¼+¼	6.3	0.0	2.7
Fluazifop-butyl	1+1	7.7	0.0	5.7
SC 1084	¼+¼	3.7	0.0	2.3
SC 1084	1+1	6.7	0.0	0.3
AmHo 0664	¼+¼	4.7	0.0	2.7
AmHo 0664	1+1	7.0	0.0	1.7
PPG 1013	¼+¼	6.3	10.0	10.0
PPG 1013	1+1	8.0	10.0	10.0
Glyphosate	4	9.0	5.7	10.0
Check	-	0.0	0.0	3.7

1/ Average of 3 replications where 0 = no control and 10 = complete control. Treated 5/24 and 6/7/84. Evaluated 6/15/84.

Table 2. The effect of directed sprays on the control of weeds 2 months after treatment (425-73-502-146-2-84)

Herbicides	Lb/A	Average Control[1/] Yellow Nutsedge	Bermuda-grass
Fluazifop-butyl	¼+¼	4.7	8.7
Fluazifop-butyl	1+1	3.0	10.0
SC 1084	¼+¼	3.3	6.3
SC 1084	1+1	1.7	9.3
AmHo 0664	¼+¼	9.7	0.0
AmHo 0664	1+1	7.0	0.0
PPG 1013	¼+¼	7.5	0.0
PPG 1013	1+1	9.3	0.0
Glyphosate	4	3.3	6.0
Check	-	8.0	0.0

1/ Average of 3 replications where 0 = no control and 10 = total kill of weeds. Treated 5/24 and 6/7/84. Evaluated 8/2/84.

The effect of a new postemergence nutsedge herbicide on the control of nutsedge and other weeds. Edson, W. D. and A. H. Lange. A heavy stand of yellow nutsedge and other weeds were treated June 20, 1984. The nutsedge was 8 to 12 inches high and about 25% in flower. The temperatures were near 90°F. The herbicides were sprayed in 50 gpa of water using 3-8004 LP nozzles operating at 15 psi. The low rates used in this test showed little or no effect on the weeds present which suggests that 3/16 Lb/A of PPG 1013 was too low. An earlier trial showed excellent results from higher rates. Glyphosate showed good control of all species even considerable activity on nutsedge. The results were somewhat inconsistent. (425-73-502-146-4-84)

A comparison of four postemergence herbicides on yellow nutsedge, flaxleaved fleabane and crabgrass in young trees (425-73-502-146-4-84)

		Average Weed Control[1/]				Average[2/]
Herbicides	Lb/A	Flaxleaved Fleabane	Crab-grass	Yellow Nutsedge 8/2/84	Nutsedge 10/4/84	Almond Phyto
PPG 1013	1/16	10.0	5.5	0.0	0.0	0.0
PPG 1013	3/16	4.0	0.0	0.0	2.5	0.0
SC 1102	1/2	0.0	0.0	0.0	0.0	0.0
SC 1102	2	5.0	4.0	0.0	0.0	0.0
Glyphosate	2	10.0	8.5	7.0	6.0	0.0
Glyphosate	4	10.0	6.5	7.0	5.0	0.0
Paraquat	1	10.0	7.5	6.0	2.5	0.0
Check	-	0.0	0.0	0.0	0.0	0.0

1/ Average of 2 replications where 0 = no control and 10 = total kill of weeds.
2/ Average of 2 replications where 0 = no phytotoxicity symptoms and 10 = total kill of almond trees.
Treated 6/20/84. Evaluated 8/2/84 unless indicated otherwise.

Preharvest weed management in almonds. Vargas, R. N. and D. Schnoor. A mature almond orchard with almost a 100 percent bermudagrass cover on it's floor was treated with various rates of glyphosate in 10 gallons of water per acre to prepare it for harvest. The herbicides was applied on May 24, 1984 with a three-wheel cycle using 8001-LP flat fan nozzle at 22 pounds pressure. Previous to the application the bermudagrass had been mowed and irrigated and allowed to grow to the seedhead stage. At the time of application the bermudagrass was actively growing.

An evaluation on June 13 indicated 90 to 95 percent control with all rates of glyphosate except the 1 pint rate. A later evaluation on August 9 just one week before harvest again indicated excellent control. The 1.5, 3 and 5 quart rates were all giving 90 percent control with the orchard floor in excellent condition for almond harvest. The 1 pint rate was only giving 25 percent control.

Preharvest almonds - low volume glyphosate

Herbicides	Lb/A	Average[1/] Bermudagrass Control 6/13	8/9
Glyphosate	1 pt.	4.0	2.5
Glyphosate	1 qt.	9.0	8.0
Glyphosate	1.5 qt.	9.5	9.3
Glyphosate	3 qt.	9.5	9.0
Glyphosate	5 qt.	9.5	9.0
Check	-	0.0	0.0

1/ Average of 3 replications where 0 = no control and 10 = 100 percent control.

A comparison of two postemergence herbicides on the control of yellow nutsedge. Edson, W. D. A heavy stand of yellow nutsedge 8 to 12 inches tall was treated June 21, 1984 in 50 gallons per acre of water. Control ratings made August 2 and October 4 indicated slightly better control of yellow nutsedge with SC 0224 than glyphosate. A comparison with paraquat indicates much better control of nutsedge with both translocated herbicides. (425-73-502-146-6-84)

A comparison of two postemergence herbicides
on the control of yellow nutsedge
(425-73-502-146-6-84)

		Average[1/]		
		Yellow Nutsedge		Lovegrass
Herbicide	Lb/A	8/2/84	10/4/84	10/4/84
Glyphosate	4	6.3	5.0	6.3
SC 0224	4	7.7	7.7	5.0
Paraquat+Pace	1+.5%	0.7	0.0	7.0
Check	-	0.0	1.0	2.7

1/ Average of 3 replications where 0 = no control and 10 = total kill of weeds. Treated 6/22/84. Evaluation dates at top of table.

A comparison of two translocated herbicides on the control of bermudagrass. Edson. W. D. A heavy stand of bermudagrass was treated with 4 Lb/A of two herbicides on June 21, 1984 in 25 gallons per acre of water. When evaluated on September 27 there was no difference in control. (425-73-502-146-7-84)

A comparison of two herbicides on the control of bermudagrass (425-73-502-146-7-84)

Herbicides	Lb/A	Average[1/] Bermudagrass Control
Glyphosate	4	6.0
SC 0224	4	6.0
Check (Paraquat+Pace)	1+.5%	0.0

1/ Average of 2 replications where 0 = no control and 10 = total control. Treated 6/21/84 in 25 gpa. Evaluated 9/27/84.

The effect of fall and spring applications of postemergence herbicides on a heavy stand of orchard bermudagrass. Edson, W. D. and A. H. Lange. A well-established stand of bermudagrass on a five year old orchard berm was treated with two rates of two translocated herbicides on October 5, 1983 using 50 gpa of water.

The spring ratings indicated good control of bermudagrass. The control rating in the fall of 1984 indicated equivalent satisfactory control with both chemicals. (425-10-502-119-1-83).

A comparison of two translocated postemergence herbicides on the control of bermudagrass (425-10-502-119-1-83)

Herbicides	Lb/A	Average[1/] Bermudagrass Control 4/5/84	5/23/84	9/27/84
Glyphosate	2	8.2	7.5	7.2
Glyphosate	4	9.0	9.0	9.2
SC 0224	2	9.5	8.8	9.2
SC 0224	4	9.0	9.3	9.5
Check	-	0.0	0.0	0.0

1/ Average of 4 replications where 0 = no control and 10 = total control. Treated 10/5/83 and 5/25/84.

The effect of gallonage on the activity of glyphosate with bermudagrass. Edson, W. D. and A. H. Lange. A heavy stand of bermudagrass was divided up into small plots and sprayed on May 25, 1984. The results suggest more activity with 3.4 gallons per acre (gpa) and about the same activity with 25 and 50 gpa comparing the activities at 2 pounds per acre (Lb/A). There was conflicting data at 4 Lb/A, but the 3.4 gallons appeared to give a little more activity at the 4 Lb/A rate than 25 or 50 gpa. (425-10-502-119-1-84)

The effect of glyphosate on bermudagrass control (425-10-502-119-1-84)

Herbicide	Lb/A	GPA	Average[1/] Control
Glyphosate	2	3.4	8.0
Glyphosate	4	3.4	9.2
Glyphosate	2	25	5.5
Glyphosate	4	25	8.3
Glyphosate	2	50	6.0
Glyphosate	4	50	9.0
SC 0224	4	50	9.2
Check	-	50	0.5

1/ Average of 4 replications where 0 = no control and 10 = complete control. Treated 5/25/84. Evaluated 9/27/84.

The effect of AmHo 0664 on the trunks of young almond trees and large weeds. Edson, W. D. A heavy stand of weeds and young almond trees in their second leaf were sprayed June 22, 1984. The herbicide spray was applied to the trunks and the lower part of main branches without spraying the foliage. Suckers were removed before spraying. On September 17, 1984 the plots were evaluated. AmHo 0664 showed excellent activity or large weeds and only slight injury to the trunks and branches. In earlier trials when foliage was sprayed severe injury occurred. There appeared to be somewhat more discoloration of the trunk with AmHo 0664 than with paraquat*. This new herbicide has considerable potential as a selective spray for annual weed control in trees and vines. (425-73-502-146-8-84)

The effects of AmHo 0664 on weed control and trunk phytotoxicity (425-73-502-146-8-84)

Herbicides	Lb/A	Average[1/] Weed Control	Average[1/] Trunk Phyto
AmHo 0664+Pace	½+1%	7.5	3.2
AmHo 0664+Pace	1+1%	8.0	3.5
AmHo 0664+Pace	2+1%	7.7	2.2
Paraquat+Pace	1+1%	6.2	1.0
Check	-	0.0	0.0

1/ Average of 4 replications where 0 = no control and 10 = total control. Treated 6/21 and 7/27/84. Evaluated 9/27/84.

* Restricted material; permit required from County Agricultural Commissioner for possession and use.

The effect of growth regulators on the production of almonds. Edson, W. D. and A. H. Lange. Early work with PPG 1721 indicated an increase on fruit set. Six individual branches were treated with PPG 1721 at 10 to 1000 ppm when the almond trees were in full bloom or slightly past on March 7, 1984 in 75 to 100 gallons per acre of water. The weather was sunny with a slight breeze. The flowers and leaves were sprayed until dripping wet. The set of nuts was not significantly different. The 1000 ppm rate may have been slightly excessive. (425-73-502-146-1-84)

The effect of spraying the flowers and leaves of almonds with a growth regulator (425-73-502-146-1-84)

Herbicide	PPM	Ave. No. of Nuts per Branch 1/
PPG 1721	10	11.7
PPG 1721	100	12.8
PPG 1721	1000	9.8
2,4-D	1	12.8
Check	-	10.8

1/ Average of 6 replications.

CHEMICAL INDEX

CAUTION!! CAUTION!!

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 INSTRUCTIONS! 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, runoff 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 data.

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, with incompatible materials, or 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 pesticides. 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 names or 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.

ACKNOWLEDGEMENTS

The authors of this research report would like to express their appreciation for the financial support of the California Pistachio Commission and the following chemical companies: Stauffer Chemical Co., BASF, Monsanto, du Pont, PPG Industries, Velsicol Corporation, SDS Biotech, Rohm and Haas, American Hoescht, and Ciba-Geigy Corp.

The authors would also like to acknowledge J. May, K. F. Lange, and the field crew of the Kearney Agricultural Center for their cooperation and time which helped made these trials possible.