Project Number 81-U7

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Plant Pathology - UC Davis
January 1982

81-U7

Almond Diseases-Hull Rot/Shot Hole/Brown Rot

Annual Report

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I. Objective

1. Hull Rot: To complete current project on epidemiology and control of Rhizopus stolonifer.

2. Shot Hole: To review and begin studies on the epidemiology of the shot hole fungus (Coryneum beijerinckii)

3. Brown Rot: To develop alternative fungicides to control Monilinia laxa.

II. Interpretive summary

1. Research has been completed on the epidemiology of the most common causal organism (Rhizopus stolonifer) but not for Monilinia fructicola. Graduate student, S. Podolsky, went on Planned Educational Leave Program (PELP) June 1, 1981, so the results have not been completed for publication. Information obtained by Podolsky resulted in directing our efforts to control Rhizopus hull rot by reducing populations of insects such as Nitidulid beetles and Drosophila fly. Drosophila has been reported previously to vector Monilinia spores. Preliminary studies have been conducted to attract insects by use of fresh watermelon and honeydew melon. Tests made by Dr. Soderstrom (USDA - Fresno) indicated that honeydews were better in attracting nitidulids than fresh almond hulls. Based on data obtained on figs for nitidulid control, dichlorvos EUP for almonds is being requested on an IR-4 program for studies in 1982. The dichlorvos tolerance is 0.5 ppm on dried figs and 0.1 ppm on fresh figs. The 1982 project will assess hull rot control through insect control. Technique to evaluate susceptibility of almond cultivars to Rhizopus stolonifer was tested by examining inoculated and random samples of almonds.

2. For shot hole control, our three-year data indicate that in commercial orchards with low incidence of disease, no benefits can be obtained for shot hole control from dormant copper spray. A single pink bud or petal fall spray with ziram or captan can effectively control disease on leaves and almond hulls in an orchard with low disease incidence.

3. Monilinia laxa resistant to benomyl has not yet been detected in almond orchards and serious disease incidences from using either benomyl or thiophanate methyl have not been brought to our attention. Alternative material "Funginex" could possibly be registered for the 1982 season. Other nonbenzimidazole fungicides are being tested for control of brown rot and shot hole and the compound Bravo has been shown to control both brown rot and shot hole.

III. Experimental procedure

1. Hull rot

A. To test for attractant qualities of melons to nitidulid beetles and Drosophila fly, honeydew melons were harvested from experimental plots at UC Davis, taken to Cortez, sliced into halves and placed within the almond trees. Diazinon WP was dusted onto the melon. We watched the fruit for a one-week period and found masses of Drosophila and considerable numbers of nitidulids killed. Dr. Soderstrom made tests on comparative attractancy between fresh almond hulls and honeydew melons. Nitidulids were more attracted to honeydew melons than to almond hulls (Exhibit A).

B. In two experimental test plots in Fresno County, insect traps were hung in almond orchards during harvest season to determine the numbers and types of insects found in the orchard. Most numerous were the Drosophila and second in number the nitidulids. The trap consisted of plastic buckets with steeped dried figs and a DDVP strip. Twenty traps were placed within each of two orchards (Exhibit B).

C. Meetings were held to request a section 18 permit for commercial testing of DDVP (dichlorvos for insect control during 1982). Residue study tests were made on the Davis campus using one and two gallons per acre rate of dichlorvos. Residue analyses were made by Dr. Soderstrom. These data were presented for IR-4 action (Exhibit C).

D. Test for susceptibility of various cultivars or selections of almonds to Rhizopus were made in Manteca. As the almond hulls opened, spore suspension inoculations were made to each of 100 almonds per cultivar. After a two-week incubation period, each inoculated sample was removed and evaluated for hull rot development. Twenty-seven cultivar inoculations were made during the season (summarized data on 17 cv are presented in Exhibit D).

2. Shot Hole

Test plot studies using commercial applications, as in the 1979 and 1980 experiments, were repeated in Cortez. The chemicals tested were captan and ziram. (Exhibit E). Plans have been made to start spraying almond trees in Arvin (near Bakersfield) to determine the effectiveness of currently recommended fungicide treatments in an orchard with severe shot hole problem. Library reference work on the epidemiology of Coryneum is being done by graduate student Lynne Highberg. Almond leaf samples have been collected to determine the variability in the Coryneum beijerinckii isolates. In January spores will be placed on trees at UC Davis with relatively little to no shot hole problem to determine if spores can survive on the trees to provide infection during leafing period in February.

3. Brown rot

Test plots to find an alternative fungicide to replace benomyl and thiophanate methyl have been made using new experimental fungicides. The 1968 survey showed no benomyl-resistant Monilinia, yet in 1977 benomyl-resistant M. fructicola was isolated from peach. In 1980, benomyl-resistant M. laxa was isolated from apricots. Our current field tests show that newer fungicides with modes of action different than those of benizimidazole fungicides can effectively control brown rot blossom blight. (Exhibit F). We have no effective control of M. fructicola infections which occur on almond hulls.

IV. Results

1. Hull rot

A. Exhibit A. Dichlorvos residues (ppm on Drake Cultivar Almonds - 1981 data with appended sheet on technique used for analyses. (Research by Ogawa and Soderstrom).

B. Exhibit B. Attractancy test comparisons between almond hulls and honeydew melon.

C. Exhibit C. Insect collection data from two almond orchards in Fresno County.

D. Exhibit D. Evaluation of almond cultivars for susceptibility to *Rhizopus stolonifer* hull rot.

2. Shot hole

A. Exhibit E. Data on shot hole control for 1979, 80, 81.

3. Brown rot

A. Exhibit F. Chemicals for brown rot control and data on evaluation of brown rot blossom blight on almonds.

4. Summary

A. Exhibit G. Suggestions on almond disease control.

V. Discussion

1. Hull Rot

With research on epidemiology completed for *Rhizopus stolonifer*, our emphasis will be on disease control by reducing the population of insect vectors. Our preliminary plans for research during the coming year will be to: 1) Use insecticides such as dichlorvos at hull split to kill *Nitidulids* and *Drosophila*. Such studies done in cooperation with Dr. Soderstrom of USDA in Fresno will determine if the insects carrying the spores are coming in from outside the orchard concerned or are somewhat localized within the orchard. We feel that reducing insect populations for two to three weeks during hull split could reduce the disease incidence initially to prevent rapid spread from the infected to the healthy newly splitting hulls. 2) The use of attractants which could direct insects to feed on insecticide-contaminated melons instead of almond hulls. Preliminary studies show that the honeydew melons have a greater attracting mechanism than almond hulls (USDA 1981 data by Soderstrom). Insect control will be related to field incidences of hull rot in large-scale field trials. The evaluation technique for determining susceptibility of almond hulls on *Rhizopus* will be perfected.

2. Shot hole

Collections of shot-hole disease samples are being made with maximum effort to come during spring 1982. The leaf shot hole observed during fall 1981 will be related to disease incidence during spring 1982. Our greatest effort will be to study the etiology and epidemiology of the shot hole fungus in commercial orchards. We look forward to understanding why fungicide disease control efforts in one area are considered excellent while in another area they are considered poor. The explanation could very well be the cultural conditions or selection of cultivars. Thus we plan on growing young almond trees in cans for exposure in orchards to test cultivar susceptibility, presence of inoculum, to testing fungicides for efficacy in protection of leaf infections. Another emphasis will be to assess the role of peduncle infections to fruit drop and leaf infection to defoliation.

3. Brown rot

Benomyl is still providing the necessary control of blossom blight. Isolations of M. laxa will be made during the winter and spring to determine if benomyl-resistant strains have emerged. In addition, some studies on the fitness of benomyl-resistant M. laxa obtained from apricots will be studied to determine the possible impact of resistant lines to disease control. We will continue to obtain efficacy data on disease control with the new fungicides so that in the event benomyl becomes ineffective we will have an alternative disease control treatment.

3. A summary of the major almond disease control methods is shown in Exhibit E.

ATTACHMENTS:

Exhibit	
A	Attractancy Tests
B	Sampling of Insect Populations
B-1	Number of Insects taken from Traps
C	EUP for Dichlorvos on Almonds (6 pages)
D	Susceptibility of almond cultivars to Rhizopus
E	Chemicals and Application Timing (3 tables)
F	Chemicals for Brown Rot Control (3 pages)
G	Almond Disease Control

EXHIBIT - A

11-3-81

Attractancy Tests

Materials and Methods.--Test room was 11 feet wide x 12 feet long x 8 feet high and had a concrete floor. A 150-watt lamp was placed in the center of the room 4 feet above the floor. Test traps were placed in a circle 3 feet from the lamp. Temperature and humidity were ambient except minimum temperature of 27°C was maintained. Test and control traps were alternated in the circle.

Traps were 25 ml glass jars with a plastic snap cap containing a ½-cm diam. hole in its center. Almond hulls and almond bark were chopped in a blender. A 1¼"x1¼"x¼" piece of honeydew melon was cut up. Equal volumes were placed in each jar that had been previously sprayed with 1 pt insecticide to 20 pts solvent then air dried. After trap placement, 200 adult *Drosophila melanogaster* Meigen were released in the center of the room. After 24 hr the traps were sealed and removed for insect evaluation.

Results.--Honevdew melon attracted greater numbers of *Drosophila melanogaster* Meigen than did either the almond hulls or almond bark. Results were as follows:

Percentage of responding flies attracted to

	Hulls	Melon	Bark	Melon
R 1	20	80	11	89
2	7	93	4	96
3	28	72	16	84
$\bar{X}$	18	82	10	90

EXHIBIT B

Sampling of insect populations in almond orchards during harvest in Fresno County

Orchard	Numbers of insect sampled		
	Nitidulids	Diptera	Drosophila
Cunha (C)			
4	64	20	3232
6	256	4	4864
7	48	1	1040
8	320	2	1584
B	112	1	3200
D	160	14	4256
F	96	32	6848
H	128	5	2064
J	224	8	440
G	64	20	6784
Freeman (F)			
2	16	64	1280
4	64	30	3200
6	800	30	1168
9	480	40	6880
10	480	128	3456
A	48	3	960
C	160	6	2400
D	144	20	2240
G	160	30	1280
J	240	15	944

[a]Cunha, A. 5069 West Clayton, Fresno, CA 93706 (209/264-8833)
Freeman, O. Marks Ave., Fresno, CA 93706 (209/266-6958)

[b]Traps set September 1, 1981 and removed September 9, 1981. Twenty traps each at Cunha and Freeman.

EXHIBIT - B -1

Number of Insects Taken from Traps in Almond Orchards

in Fresno County - 1981

Species	Trap Identification (C-)																			
	1	2	3	4	5	6	7	8	9	10	A	B	C	D	E	F	G	H	I	J
Carpophilus hemipterus	x	x	48	304	x	342	72	88	x	216	184	232	x	280	272	224	149	128	x	282
freemani			8			8	1					8						8		
mutilatus	x		0				4	2		16	8	8		8		1		4		8
Conotelus mexicanus	x	x		16		16		32	x	8	16	8	x	1	56	16	8	20	x	1
Urophorus humeralis	x	x	184	8	x	16	29	32	x	232	24	8	x	7	16	48	24	8	x	10
Haptoncus luteolus	x	x	256	160	x	128	64	24	x	136	240	336	x	200	88	96	256	160	x	16
Drosophila melanogaster	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Traps without numbers indicate only presence of that species-counts unavailable due to mold in insects.

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COLLEGE OF AGRICULTURAL AND ENVIRONMENTAL SCIENCES
AGRICULTURAL EXPERIMENT STATION
DEPARTMENT OF PLANT PATHOLOGY

DAVIS, CALIFORNIA 95616

December 22, 1981

TO: Harold Alford
Regional Coordinator IR-4

FROM: J. M. Ogawa
Dept. of Plant Pathology, UCD

SUBJECT: EUP for Dichlorvos on Almonds

OBJECTIVES: Control insects which act as vectors of the hull rot and Ceratocystis canker disease pathogens

PROCEDURE:

1. Obtain EUP for dichlorvos in order that large-scale field tests can be made in almond orchard to reduce populations of Nitidulid and Drosophila insects.

TENTATIVE PLANS - 1982:

Location of plot: Fresno County (Freeman)
Cultivars: NonPareil and Merced
Date of initial hull split: July 1
Date of harvest: Nonpareil Aug. 12; Merced Sept. 1
Time of applications: July 1, second based on insect monitoring data

2. A. Residue analyses from small-scale test plot.
Location: UCD Plant Pathology Orchard (Block E)
Crop: Drake almond at hull split (Sept. 12, 1981)
Plot design: Three replications of 2 single trees
Chemical: Dichlorvos (Vaponite EC)
Rate: 1 and 2 gallons per acre
Equipment: Handgun to drip stage (2.75 gal/tree)
Timing: 2 sprays - September 12
September 17

Residue samples collected:

1st	September 17	0 day
2nd	September 18	1 day
3rd	September 21	4 days
4th	September 25	8 days
5th	October 2	15 days

B. Residue analyses made under the direction of Dr. E. Soderstrom.

Corrected residue analyses report dated 11/22/81.

cc: Dr. P. Pontoriero, Shell Development Co., San Ramon
Dr. E. Soderstrom, USDA, Fresno

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
STORED-PRODUCT INSECTS RESEARCH LABORATORY
5578 AIR TERMINAL DRIVE
FRESNO, CALIFORNIA 93727

RESIDUE ANALYSIS REPORT

EXPERIMENT CODE NO.

DATE SAMPLED
9/12, 9/17, 9/18, 9/21, 9/25, 10

SCIENTIST
Soderstrom and Ogawa

PESTICIDE
Vapona (DDVP)

SAMPLE DESCRIPTION
Almonds - (inhull)

Page 1 of 3

Code Number	Sample Identity	Estimated Residue (PPM)	Extraction Date	Test Date	Residue (PPM)
1a	Drake Almond Control 9/12 hulls		11/12	11/12	0.03
1b	Drake Almond Control 9/12 shells				0.03
1c	Drake Almond Control 9/12 meats				<0.02
2a	Drake Almond Control 9/12 hulls	10.0 ppm added			(99.0%) 9.9
2b	Drake Almond Control 9/12 shells	20. ppm added			(98.5%) 19.7
2c	Drake Almond Control 9/12 meats	0.10 ppm added			(120.0%) 0.12
3a	Drake 2 lb./acre 9/17 hulls				9.7
3b	Drake 2 lb. 9/17 shells				23.3
3c	Drake 2 lb. 9/17 meats				0.14
4a	Drake 4 lb. 9/17 hulls				16.5
4b	Drake 4 lb. 9/17 shells				31.9
4c	Drake 4 lb. 9/17 meats				0.61
5a	Drake 2 lb. 9/18 hulls				5.7
5b	Drake 2 lb. 9/18 shells				24.9
5c	Drake 2 lb. 9/18 meats				0.20
6a	Drake 4 lb. 9/18 hulls				7.7
6b	Drake 4 lb. 9/18 shells				36.1
6c	Drake 4 lb. 9/18 meats				0.32

ANALYTICAL METHOD
GLC, N and P Detector

11-20-81
DATE

Preston Hartsell
CHEMIST

EXHIBIT C

(3 of 6)

U.S. DEPARTMENT OF AGRICULTURE
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RESIDUE ANALYSIS REPORT

EXPERIMENT CODE NO.

DATE SAMPLED

SCIENTIST

PESTICIDE

SAMPLE DESCRIPTION

Code Number	Sample Identity			Estimated Residue (PPM)	Extraction Date	Test Date	Residue (PPM)
7a	Drake Almond Control	9/12	hulls	1.0 ppm added	11/13	11/13	110.0% 1.1
7b	Drake Almond Control	9/12	shells	0.5 ppm added			(96.0%) 0.48
7c	Drake Almond Control	9/12	meats	0.05 ppm added			(80.0%) 0.04
8a	Drake 2 lb.	9/21	hulls				0.24
8b	Drake 2 lb.	9/21	shells				12.0
8c	Drake 2 lb.	9/21	meats				0.11
9a	Drake 4 lb.	9/21	hulls				0.57
9b	Drake 4 lb.	9/21	shells				34.3
9c	Drake 4 lb.	9/21	meats				0.20
10a	Drake 2 lb.	9/25	hulls	11/16	11/16		0.61
10b	Drake 2 lb.	9/25	shells				11.0
10c	Drake 2 lb.	9/25	meats				0.15
11a	Drake 4 lb.	9/25	hulls				0.20
11b	Drake 4 lb.	9/25	shells				10.8
11c	Drake 4 lb.	9/25	meats				0.30
12a	Drake 2 lb.	10/2	hulls				0.03
12b	Drake 2 lb.	10/2	shells				1.1
12c	Drake 2 lb.	10/2	meats				0.03

ANALYTICAL METHOD

DATE 11-20-81

CHEMIST Preston Hartsell

WR FORM 627
25 SEP 1975

EXHIBIT C

(4 of 6)

U.S. DEPARTMENT OF AGRICULTURE
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5578 AIR TERMINAL DRIVE
FRESNO, CALIFORNIA 93727

RESIDUE ANALYSIS REPORT

EXPERIMENT CODE NO.

DATE SAMPLED

SCIENTIST

PESTICIDE

SAMPLE DESCRIPTION

Page 3 of 3

Code Number	Sample Identity	Estimated Residue (PPM)	Extraction Date	Test Date	Residue (PPM)
13a	Drake 4 lb. 10/2 hulls		11/17	11/17	0.03
13b	Drake 4 lb. 10/2 shells				4.2
13c	Drake 4 lb. 10/2 meats				0.13

ANALYTICAL METHOD

11-20-81
DATE

Preston Hartsell
CHEMIST

WR FORM 627
SE SEP 1975

Dichlorvos Residues (ppm) on Drake Cultivar Almonds - 1981

Orchard Sample	Hulls		Shells		Meats	
Date	2 lb[a/]	4 lb	2 lb	4 lb	2 lb	4 lb
Untreated Control	.03		.03		>.02	
9/17	9.7	16.5	23.3	31.9	0.14	0.61
9/18	5.7	7.7	24.9	36.1	0.20	0.32
9/21	0.24	0.57	12.0	34.3	0.11	0.20
9/25	0.61	0.20	11.0	10.8	0.15	0.30
10/2	0.03	0.03	1.1	4.2	0.03	0.13

a/ Pounds per acre

11-19-81

Determination of DDVP (Vapona) Residues on Almonds

1. Grind sample (50 g. +) hulls, shells or meats to a fine state in Waring blender.

2. Weigh 50 g. of ground sample and place in 500 ml Eberbach blender jar with teflon-lined lid.

3. Add 25 g. NA_2SO_4 (anhydrous) to sample.

4. Add 200 ml ethyl acetate (pesticide grade).

5. Blend for 3 min. at high speed.

6. Transfer ca 150 ml of extract to a 200 ml centrifuge tube and centrifuge for 5 min at 1500 RPM.

7. Transfer 10 ml of supernatant to 15 ml centrifuge tube, add 1 g. NA_2SO_4 and shake.

8. Make dilutions as necessary (according to linearity of detector) and take suitable aliquot for GLC injection.

9. GLC conditions:

   (a) Hewlitt Packard 5830A with Nitrogen-Phosphorus Detector.
   (b) Column - 2 mm I.D. x 1.8 M, 10% OV-101 on Gas Chrom Q, 100/120 mesh.
   (c) Off-column injection into glass-inserts which are changed after 8-10 injections of meat extracts, less often with hulls or shell extracts
   (d) Column temperature - 165^{o}C.
   (e) Injectors temperature - 180^{o}C.
   (f) Detector temperature - 250^{o}C.
   (g) Helium carrier flow rate - 22 ml/min.
   (h) Hydrogen flow rate - 3 ml/min.
   (i) Air flow rate - 50 ml/min.
   (j) Detector voltage 16.5 VDC

10. DDVP recovery average from six fortifications - 101.6%

11. Retention time - 2.4 min.

EXHIBIT D

Susceptibility of almond cultivars to Rhizopus hull rot

	Percent Disease[a]		
Cultivar	Inoculated	Natural	Harvest date
Paper Shell			
Nonpareil	66	35	8/28
Nonpareil	32	20	8/21
Jordanolo	44	4	9/11
Price	12	0	9/11
Soft Shell			
Tokyo	72	32	9/11
Fritz	28	28	10/9
Sauret 1	26	0	8/21
Ne Plus Ultra	21	0	8/28
Semisoft Shell			
LeGrand	81	52	10/9
Monarch	62	0	9/11
Butte	60	20	10/2
Yosemite	40	4	9/11
Mono	25	0	8/28
Hard Shell			
Mission	81	16	10/9[b]
Mission	79	58	10/9[b]
Ruby	65	68	10/9[b]
Peerless	8	0	9/11

[a]200 hulls inoculated and inspected for *Rhizopus stolonifer* mycelia.

[b].026 inches of rain between inoculation date (9/24) and harvest date (10/9) 1981 data.

CHEMICALS AND APPLICATION TIMING ON INCIDENCE OF CORYNEUM BLIGHT OF NONPAREIL ALMOND - 1979

Treatment and timing					
Dormant 12/8	Delayed dormant 1/25	Pink bud 2/27	Petal fall 3/14	% Leaves with shothole	% Fruit with shothole
	Cu	Captan	Captan	17.1 xy	0.7 x
	Cu	Ziram	Ziram	8.9 x	1.0 x
	Cu		Ziram	22.6 y	3.3 x
	Cu	Ziram		16.1 xy	7.7 x
SPCP	Cu	Ziram		16.5 xy	14.7 x
Cu	Cu			32.7 y	42.7 y
SPCP	Cu			22.8 y	55.3 yz
	Cu			49.5 z	65.7 z

EXHIBIT E

CHEMICALS AND APPLICATION TIMING ON INCIDENCE OF CORYNEUM BLIGHT OF ALMOND

1980

		Applications			
Treatment	Conc/ acre	Dormant 1/5	Pink bud 2/12	Petal fall 3/4	% Hulls with *Coryneum* Merced
COCS 50%	16 lb	+	-	-	7.1 x
Ziram 76%	8 lb	-	+	+	
Ziram 76%	8 lb	-	+	+	10.9 x
Captan 50W	8 lb	-	-	+	34.2 y
Ziram 76%	8 lb	-	-	+	35.7 y
Ziram 76%	8 lb	-	+	-	37.8 y
Captan 50W	8 lb	-	+	-	53.4 y
COCS 50%	16 lb	+	-	-	87.4 z
Check	--	-	-	-	84.3 z

EXHIBIT E

CHEMICALS AND APPLICATION TIMING ON INCIDENCE OF CORYNEUM BLIGHT ON NONPAREIL ALMOND LEAVES

1981

Treatment	Conc/ acre	Applications: Dormant 1/21	Applications: Pink bud 2/18	Applications: Petal fall 3/9	Avg. no. infected leaves on ground/ 2.5 ft^2
Ziram 76%	8 lb	Cu	+	+	15 y
Captan 50W	8 lb	Cu	+	+	16 y
Captan 50W	8 lb	Cu	-	+	22 y
Captan 50W	8 lb	Cu	+	-	24 y
Ziram 76%	8 lb	Cu	-	+	24 y
Ziram 76%	8 lb	Cu	+	-	24 y
Bravo 500	4 pt	Cu	-	+	26 y
Check	--	Cu	-	-	112 z

CHEMICALS FOR BROWN ROT CONTROL ON ALMOND

REGISTERED	EXPERIMENTAL
BENLATE	TRIFORINE
TOPSIN	ROVRAL
CAPTAN	VANGARD
MANEB	BRAVO
FIXED COPPER	BAYLETON
BORDEAUX MIXTURE	BAYCOR
SULFUR	PROCHLORAZ

EXHIBIT F

EVALUATION OF FUNGICIDES FOR BROWN ROT (MONILINIA LAXA) BLOSSOM AND SHOOT BLIGHT CONTROL IN DRAKE ALMOND

Treatment[a]	Conc/100 gal	Application[b] 0-10% Bloom	Full bloom	Avg. shoot strike/tree[c]
Bravo 500 + Benlate 50W	2 pt 6 oz	Combination	Bravo only	0 y[d]
Prochloraz 50W	6 oz	Sprayed	Not sprayed	0 y
Bravo 500 + Benlate 50W	4 pt 6 oz	Combination	Bravo only	0.3 y
Captan 50W + Benlate 50W	2 lb 6 oz	Combination	Ziram only	0.5 y
Check	---	---	---	6.5 z

[a]One or two blossom sprays applied with hand-gun sprayer, 6 gal/tree.

[b]Application dates: 0-10% bloom - 2/18; full bloom - 2/26. Fungicides applied as indicated in table.

[c]All shoot strikes on each of four trees were counted on 4/8/81.

[d]Numbers in vertical column followed by the same letter are not significantly different, P = 0.05.

EVALUATION OF FUNGICIDES FOR BROWN ROT (*MONILINIA LAXA*) BLOSSOM AND SHOOT BLIGHT CONTROL IN DRAKE ALMOND

Treatment[a]	Conc/100 gal	% Shoot strikes/tree[b]
Benlate 50W + Captan 50W	6 oz 2 lb	7.8 x[c]
Vangard 10W	6 oz	13.8 x
Baycor 50W + Penetrator 3	6 oz 1 pt	14.6 x
Bayleton 50W	6 oz	25.6 y
Check	---	40.2 z

[a]One blossom spray applied with hand-gun sprayer, 7 gal/tree at full bloom (2/23).

[b]Four hundred shoots on each of six trees were evaluated on 4/9/81.

[c]Numbers in vertical column followed by the same letter are not significantly different, P = 0.05.

EXHIBIT G

ALMOND DISEASE CONTROL

HULL ROT caused by *Rhizopus* and *Monilinia*

- early harvest
- use more resistant cultivars
- promote rapid drying of hulls on tree
- insect control?
- brown rot blossom blight control

SHOT HOLE caused by *Coryneum*

- avoid buildup of disease
- avoid free moisture

BROWN ROT caused by *Monilinia* species

- proper timing of fungicides