ASPARAGUS

Variety Evaluation & Pest Management in San Joaquin County

2006 RESEARCH PROGRESS REPORT

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2006 ASPARAGUS VARIETY EVALUATION AND PEST MANAGEMENT TRIALS

RESEARCH PROGRESS REPORT

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The asparagus variety evaluation and pest management research program in San Joaquin County is conducted with the cooperation and management assistance of the following growers and managers: Ed Zuckerman and Ken Jochimsen and Graydon Nichols, Jim Jerkovich and Tony Piazza, as well as Cher Watte and the California Asparagus Commission. It is their fine cooperation, financial and in-kind support and patience that benefit all asparagus growers in San Joaquin County and elsewhere. Great appreciation and many thanks are extended to these individuals for their contributions and interest.

CAUTION

This publication is a research progress report of asparagus cultivar evaluation trials and pest management studies conducted in San Joaquin County during 2006. This report presents results of asparagus insect and disease management trials conducted with local grower cooperators. They should not, in any way, be interpreted as a recommendation of the University of California. Chemical or common names of pesticides are used in this report instead of the more common trade names of those products. No endorsement of products mentioned or criticism of similar products is intended. The rates of pesticides in this report are always expressed as active ingredients (A.I.) of the material per treated acre, unless otherwise indicated.

Trade Name	Common or Chemical Name	Manufacturer
Scholar (50WP)	fludioxonil	Syngenta Crop Protection
Warrior (1.0CS)	lambda-cyhalothrin	Syngenta Crop Protection
Mustang (1.5EW)	beta-cypermethrin	FMC Corporation

CULTIVAR EVALUATION TRIALS

UC Asparagus Cultivar Evaluation Trial (Zuckerman-Heritage Farms) – This trial was established in 2002 with one-year-old crowns on McDonald Island, west of Stockton, California. The crowns were provided by California Vegetable Specialties (Rich Collins) from their fumigated nursery site near Delhi, California and some were provided by Ed Zuckerman and Ken Jochimsen from the grower's own crown nursery on McDonald Island. The trial contains 12 replicated lines and another 29 observation varieties in single or two-replication plots. Advanced cultivars from Dr. Mikeal Roose's breeding program at UC Riverside, Dr. Steve Garrison and Chee-Kok Chin's breeding program at Rutgers University in New Jersey and the private asparagus variety development program from Brian Benson at California Seed and Transplant near Davis, California, make up the trial. Due to the rainy, cold weather of this past winter-spring, the trial was only cut 24 times over 59 days, a 17% decrease from a normal harvest season. The trial receives most of its moisture and fertility requirements from a buried drip irrigation system. Wet weather conditions caused some crop loss due to Phytophthora crown and spear rot (*Phytophthora megasperma* var. *sojae*). Given the previously noted environmental conditions, yields were reasonably good for many of the cultivars in the replicated trial, led by Jersey Supreme at 4,893 Lbs/Acre and then followed by Grande (4,837 Lbs/Acre), NJ 953 (4,753 Lbs/Acre), UCR 115 (4,171 Lbs/Acre), F141 x M256 (4,056 Lbs/Acre), UC 157F_1 (3,844 Lbs/Acre), and F586 x M256 (3,816 Lbs/Acre). Largest spear size was attained by Dulce Verde, Purple Passion, F586 x M256, Grande and F141 x M256. Best spear quality occurred with UCR 115, UC 157F_1, F141 x M256, Purple Passion and NJ 977. Complete data from the replicated trial at Zuckerman-Heritage Farms in shown in **Table 1.**

In the 29-cultivar observation trial at Zuckerman-Heritage Farms, yields were also reasonably good for a number of lines. The top yielding variety was NJ 956 at 5,227 Lbs/Acre, followed by F177 x M256 (4,851 Lbs/Acre), F172 x M256 (4,708 Lbs/Acre, FCE1 x M120 (4,673 Lbs/Acre), FCE3 x M256 (4,251 Lbs/Acre), NJ 963 (3,910 Lbs/Acre) and FCE2 x HMJ (3,795 Lbs/Acre). Largest spear size was attained by F177 x M256, FCE2 x HMJ, NJ 937, FCE7 x M256 and F133 x M256. Best spear quality was achieved by FCE1 x M256, F137 x MCE4 and F82-2 x M256, followed by FCE3 x M256, FCE1 x M120, F177 x MCE1, F177 x M256, FCE7 x M256 and F133 x M256. Complete observation trial data is contained in **Table 2.**

One of the persistent problems observed in local asparagus stand establishment is the use of one-year-old crowns from grower nurseries in the Sacramento-San Joaquin Delta area. Most of these nurseries are located in fields with a recent history of asparagus culture and consequently have high inoculum levels of Fusarium crown and root rot (*Fusarium*

oxysporum, f.sp. *asparagi* and *Fusarium moniliforme*). Fumigation efforts on highly organic Delta soils used for crown nurseries have met with mixed results because soil-applied fumigant materials tend to get tied up by the organic matter in the soils. Because Fusarium is the most serious chronic pathogen affecting asparagus production worldwide, growers are encouraged to put their own crown nursery planting in soils without a crop history of asparagus and without a composition high in organic matter (in other words away from the Delta). Fumigation of the nursery site also should be done to ensure good, clean, healthy crowns for planting in new production asparagus beds the following year. The final planting sites for new production beds ideally should also be in ground without an asparagus crop history to reduce the incidence of asparagus infection from Fusarium in succeeding years.

When the asparagus cultivar evaluation trial was established at Zuckerman-Heritage Farms in 2002, a separate mini-trial was also planted comparing crowns of four UC cultivars (UC 157F_1, UCR 115, F141 x M256 and F586 x M256) from different nursery sites - one a grower nursery in the Delta with previous asparagus crop history and the other a non-asparagus crop history nursery site, on mineral soil that was fumigated, near Delhi, California. Initial growth of the crowns at the Zuckerman-Heritage Farms trial was superior for all four varieties from the Delhi nursery over the same four varieties from the grower nursery site in the Delta. Yields of these plots were taken for 30 days during the 2003 season and all four of the varieties from the Delhi fumigated nursery outyielded the same four varieties from the Delta nursery site, where Fusarium had been present. During the past three full harvest seasons (2004, 2005 and 2006), three of the four cultivars from Delhi are still significantly out producing the same three lines from the Delta nursery site, with the fourth line giving somewhat better yields with crowns from the Delta site over the Delhi nursery site.

All of this may suggest there is some benefit that has occurred from crowns grown on fumigated, non-asparagus crop history ground at the Delhi site for the majority of the selected lines evaluated. It is recommended that asparagus nursery sites for seedlings or crowns be located on soils with no asparagus crop history and that those sites be fumigated. The other suggestion would be to establish the final production beds on ground without a history of asparagus as well. In this way, clean crowns or seedlings would be planted into relatively disease-free soil. Data on this year's nursery comparison lines with respect to yield are given in **Table 3**.

This past spring, an asparagus crown nursery was planted with Bob Whitaker on a Dinuba fine loamy sand soil south of Manteca, California. The crown nursery contains 16 lines from the University of California Riverside, Rutgers University, and the private asparagus breeding programs of Brian Benson (California Asparagus Seed and Transplant) and Peter Falloon in New Zealand and will be planted as one-year-old crowns in a replicated block with a local San Joaquin County asparagus grower next spring. In addition, another 28 observation lines from the same seed sources are in the crown nursery. A satellite trial of six purple asparagus lines from Rutgers University, Brian Benson and Peter Falloon are also in the nursery to be planted as a replicated specialty crop trial that Benny Fouché, Farm Advisor, UCCE San Joaquin County, will conduct with a local asparagus grower. **Table 4.** contains a listing of the asparagus nursery cultivars and their seed sources.

Table 1. 2006 ASPARAGUS CULTIVAR EVALUATION TRIAL
Zuckerman – Heritage Farms; McDonald Island

(24 harvests over 59 days)
Replicated Varieties

Cultivar	Yield [1] Lbs/Acre	No. Spears [1] per Acre	Average [1] Spear Wt. (g.)	Spear Quality [2]
Jersey Supreme	4,893	88,444	25.1g	2.13
Grande	4,837	70,916	31.0g	2.88
NJ 953	4,753	95,832	22.5g	2.66
UCR 115	4,171	72,310	26.2g	3.44
F141 x M256	4,056	60,810	30.3g	3.25
UC $157F_1$	3,844	68,825	25.4g	3.28
F586 x M256	3,816	53,422	32.4g	2.69
Apollo	3,579	58,998	27.5g	2.69
Atlas	3,554	56,105	28.8g	2.75
NJ 977	2,718	54,642	22.6g	2.94
Purple Passion	1,519	19,341	35.7g	3.19
Dulce Verde	892	10,907	37.1g	2.06
LSD @ 5%:	1,022	17,912		
C.V. =	14.1%	21.0%		

[1] Average of four replications
[2] Average of 24 harvests:

Rating Scale	
very good =	4.00
good =	3.50
fair to good =	3.00
fair =	2.50
fair to poor =	2.00
poor =	1.50

Table 2. 2006 ASPARAGUS CULTIVAR EVALUATION TRIAL
Zuckerman – Heritage Farms; McDonald Island

(24 harvests --59 days)
Observation Lines

Cultivar	Yield[1] Lbs/Acre	No. Spears[1] per Acre	Average[1] Spear Wt. (g.)	Spear Quality[3]
NJ 956[2]	5,227	103,150	23.0g	2.85
F177 x M256	4,851	75,969	29.0g	3.25
F172 x M256[2]	4,708	80,847	26.4g	2.94
FCE1 x M120	4,673	81,022	26.2g	3.38
FCE3 x M256[2]	4,251	72,658	26.6g	3.44
NJ 963	3,910	79,105	22.4g	2.00
FCE2 x HMJ[2]	3,795	60,287	28.6g	2.69
FCE1 x M256	3,697	62,029	27.1g	3.50
NJ 937	3,652	60,287	27.5g	2.50
F82-2 x M256	3,520	70,741	22.6g	3.50
F133 x HMJ	3,370	62,378	24.5g	2.38
F137 x MCE4[2]	3,297	64,120	23.3g	3.50
NJ 982	3,251	78,408	18.8g	2.50
FCE7 x M256	3,185	52,620	27.5g	3.25
NJ 1021	3,150	62,029	23.1g	2.50
F133 x M256	3,115	52,620	26.9g	3.25
FCE1 x A1[2]	2,962	51,227	26.3g	3.19
NJ 1018	2,938	63,772	20.9g	2.75
NJ 978	2,446	63,075	17.6g	2.25
F177 x MCE2	1,868	37,636	22.5g	2.13
NJ 990	1,687	42,863	17.9g	2.25
NJ 976	1,460	33,803	19.6g	2.50
F177 x MCE1	1,342	36,242	16.8g	3.38

[1] Average of only one replication
[2] Average of two replications
[3] Average of 24 harvests

Rating Scale – very good =	4.00
Good =	3.50
Fair to Good =	3.00
Fair =	2.50
Fair to Poor =	2.00
Poor =	1.60

Table 3. 2006 ASPARAGUS CULTIVAR EVALUATION TRIAL *
Zuckerman – Heritage Farms; McDonald Island

(24 harvests over 59 days)

SELECTED CULTIVAR COMPARISON OF CROWNS FROM TWO DIFFERENT NURSERIES

Cultivar	Yield[1] Lbs/Acre	No. Spears[1] per Acre	Average[1] Spear Wt. (g.)	Spear[4] Quality
UCR 115 (Delhi)	3,788	68,302	25.2g	3.38
UCR 115 (McDonald Island)	2,154	39,378	24.8g	3.50
F141 x M256 (Delhi)	4,182	70,393	27.0g	3.25
F141 x M256 (McDonald Island)	2,370	43,908	24.5g	3.38
F586 x M256 (Delhi)	2,342	42,166	25.2g	3.00
F586 x M256 (McDonald Island)	2,732	40,075	31.0g	3.38
UC $157F_1$ (Delhi)	4,335[2]	82,241[2]	23.9g	3.44
UC $157F_1$ (McDonald Island)	3,617[3]	65,445[3]	25.1g	3.32

[1] Average of only one replication
[2] Average of two replications
[3] Average of four replications
[4] Average of 24 harvests -

Rating Scale – very good =	4.00
Good =	3.50
Fair to Good =	3.00
Fair =	2.50
Fair to Poor =	2.00
Poor =	1.50

Table 4. 2006 Asparagus Crown Nursery (Whitaker Farms; Manteca, California)

			breeder/seed source	contact
PURPLE TRIAL - 200 crowns each				
	1	Pacific Purple	400	NZ	Peter Falloon
	2	Purple Passion	31 g	Cal Asparagus	Brian Benson
	3	NJ 1069	500	Rutgers	Chee-kok Chin and Stephen Garrison
	4	NJ 1016	500	Rutgers	Chee-kok Chin and Stephen Garrison
	5	NJ 1062	350	Rutgers	Chee-kok Chin and Stephen Garrison
	6	NJ 1092	300	Rutgers	Chee-kok Chin and Stephen Garrison
	7	NJ 1064	500	Rutgers	Chee-kok Chin and Stephen Garrison
GREEN TRIAL - 200 crowns each				
	8	Grande	28 g	Cal Asparagus	Brian Benson
	9	Apollo	28 g	Cal Asparagus	Brian Benson
	10	UC 157F_1	29 g	Cal Asparagus	Brian Benson
	11	Atlas	24 g	Cal Asparagus	Brian Benson
	12	De Paoli	12 g	UC	Stan Cutter
	13	NJ 1031	500	Rutgers	Chee-kok Chin and Stephen Garrison
	14	NJ 953	500	Rutgers	Chee-kok Chin and Stephen Garrison
	15	NJ 1019	500	Rutgers	Chee-kok Chin and Stephen Garrison
	16	Pacific 2000	400	NZ	Peter Falloon
	17	FCE1 x M256	8 g	UC	Mike Roose and Neil Stone
	18	FCE2 x M256	8 g	UC	Mike Roose and Neil Stone
	19	FCE3 x M256	8 g	UC	Mike Roose and Neil Stone
	20	F582 x M256	8 g	UC	Mike Roose and Neil Stone
	21	FCE4 x M256	8 g	UC	Mike Roose and Neil Stone
	22	F132 x MCE4	8 g	UC	Mike Roose and Neil Stone
OBSERVATIONAL TRIAL - 50 crowns each				
	24	NJ 951	500	Rutgers	Chee-kok Chin and Stephen Garrison
	25	NJ 956	500	Rutgers	Chee-kok Chin and Stephen Garrison
	26	73 x 22	200	NZ	Peter Falloon
	27	74 x 22	200	NZ	Peter Falloon
	28	3 x Phy20	200	NZ	Peter Falloon
	29	F172 x MCE4	1.7 g	UC	Mike Roose and Neil Stone
	30	FCE3 x A1	1.4 g	UC	Mike Roose and Neil Stone
	31	F181 x MCE4	2 g	UC	Mike Roose and Neil Stone
	32	F597 x MCE4	2 g	UC	Mike Roose and Neil Stone
	33	FCE7 x M120	2 g	UC	Mike Roose and Neil Stone
	34	F608 x MCE4	2 g	UC	Mike Roose and Neil Stone
	35	F582 x MCE4	2 g	UC	Mike Roose and Neil Stone
	36	FCE7 x M256	2 g	UC	Mike Roose and Neil Stone
	37	F597 x MCE2	2 g	UC	Mike Roose and Neil Stone
	38	F600 x A1	2 g	UC	Mike Roose and Neil Stone
	39	F189 x MCE4	2 g	UC	Mike Roose and Neil Stone
	40	F582 x A1	2.2 g	UC	Mike Roose and Neil Stone
	41	F582 x A1	2 g	UC	Mike Roose and Neil Stone
	42	FCE5 x A1	2.17 g	UC	Mike Roose and Neil Stone
	43	F609 x MCE2	2 g	UC	Mike Roose and Neil Stone
	44	FCE4 x A1	4.5 g	UC	Mike Roose and Neil Stone
	45	F177 x MCE4	4.5 g	UC	Mike Roose and Neil Stone
	46	F586 x MCE1	2 g	UC	Mike Roose and Neil Stone
	47	FCE6 x A1	4.3 g	UC	Mike Roose and Neil Stone
	48	F583 x MCE4	2 g	UC	Mike Roose and Neil Stone
	49	FCE5 x M256	1.22 g (50 seeds)	UC	Mike Roose and Neil Stone
	50	F608 x MCE2	1.1 g (50 seeds)	UC	Mike Roose and Neil Stone
	51	F132 x MCE2	1.2 g (50 seeds)	UC	Mike Roose and Neil Stone

Pest Management Research Trials

2004 – 2006 Asparagus Fusarium Control Trial (Jan Mickler, Brenna Aegerter, Bob Mullen, Scott Whiteley, Don Colbert, Randall Wittie and Nate Battig.)

A three-year project, funded by the IR-4 minor crop registration program, was initiated in 2004 at Victoria Island Farms (Graydon Nichols, Jim Jerkovich and Tony Piazza) west of Stockton, California. Scholar (fludioxonil), a fungicide, was selected for evaluation as a crown dip or an in-furrow spray treatment at planting of one-year-old asparagus crowns for the control of Fusarium crown and root rot (*Fusarium oxysporum*, f.sp. *asparagi* and *Fusarium moniliforme*), the most serious disease affecting asparagus production worldwide.

Two sources of crowns were used – Bob Whitaker Farms nursery on fumigated sedimentary soils with no previous asparagus crop history and Victoria Island Farms nursery on a fumigated muck (high organic) soil with an asparagus production history. Prior to trial establishment, crowns from both nurseries were evaluated for Fusarium incidence and severity. The crowns were surface-disinfected for five minutes in a 10% sodium hypochlorite solution, and rinsed in deionized water three times for five minutes each. After air drying for 15 minutes, three rootlets were cut just below the crown and five segments, ranging from nine to fifteen mm in length, were cut in sequence beginning at the point most proximal to the crown. The segments were plated on PDA and incubated at room temperature. Incidence and severity were measured seven days later. Initial results showed that Victoria Island crowns had about three times greater incidence and severity of Fusarium than those from Whitaker Farms, demonstrating the initial value of fumigation and selection of crown nursery site with no previous asparagus crop history.

Two trials, evaluating crowns from each nursery source, were established on March 9, 2004. Crowns were dipped for a two-minute soak at different rates of fungicide in 100 gallons water and then planted. The in-furrow at planting sprays of fungicide utilized a hand-held CO_2 backpack sprayer with a spray volume of 100 gallons water per acre. The untreated one-year-old crowns were planted before the in-furrow sprays were made. All treatments were then covered with three to four inches of soil. The field received irrigation from winter rainfall and a sub-surface drip irrigation system. The soil at the trial sites was an Egbert muck and the asparagus variety was UC $157F_1$. Asparagus fern ratings were taken during the spring/summer and were somewhat variable depending on which crowns nursery trial was evaluated.

During the spring of 2006, selected crowns were dug up from each treatment in each trial. They were then plated and scored for Fusarium incidence and severity. Additionally the two trials were harvested midweek for seven weeks, beginning March 15, 2006. Data on spear numbers and yield in pounds per Acre were taken, as well as spear size. **Tables 5A** and **5B** show the results of crowns sampled and evaluated for Fusarium incidence and severity as well as the asparagus stand count per plot in both the plot involving fumigated nursery crowns grown on sedimentary soils with no previous asparagus crop history and the smaller plot using grower grown nursery crowns that were fumigated in a high organic soil (Egbert muck) on ground with an asparagus crop history. Between the two plots, crop stand numbers were better on crowns from Whitaker Farms nursery compared to those from Victoria Island Farms. However the rate of Fusarium incidence and severity was generally higher in the

treatments in both plots than the untreated controls. One minor, but not significant, exception was the in-furrow spray treatment of the lower rate of Scholar (fludioxonil) with the Whitaker Farms crowns. **Tables 6A** and **6B** show the summary of yield data taken in both plots. Basically there were no significant differences with any of the treatments compared to the untreated controls. There was a slight yield benefit of fludioxonil at the lower rate as an in-furrow spray with the Whitaker Farms crowns (Table 6A) and a very slight increase in yield with a crown dip treatment of fludioxonil using the Victoria Island Farms crowns (Table 6B) relative to the untreated controls. Future work, if any, for Scholar (fludioxonil) as a possible tool for Fusarium management in newly planted asparagus would have to be based on results from other IR-4 tests conducted in Washington and Michigan.

Table 5A. Effect of fludioxanil dips and in-furrow treatments on asparagus stand and Fusarium incidence and severity 3 years after transplanting crowns from a fumigated nursery. (Whitaker Farms) that was on sedimentary soil with no asparagus crop history

Treatment	Rate	Stand	Fusarium Incidence (%)	Fusarium Severity (%)
Scholar Crown Dip	0.125	30.0	90.0	84.0
Scholar Crown Dip	0.250	26.0	90.0	83.0
Scholar Crown Dip	0.500	34.3	85.0	82.8
Scholar In-Furrow Spray	0.250	31.8	80.0	72.4
Scholar In-Furrow Spray	0.500	32.3	88.3	84.2
Non-treated Control		32.0	85.8	83.3
LSD (P=0.05)=		NS	NS	NS

Table 5B. Effect of fludioxanil dips and in-furrow treatments on asparagus stand and Fusarium incidence and severity 3 years after transplanting crowns from a fumigated nursery. (Victoria Island Farms) that was on high organic soil with an asparagus crop history

Treatment	Rate	Stand	Fusarium Incidence (%)	Fusarium Severity (%)
Non-treated Control		27.3	72.5	58.7
Scholar Crown Dip	0.250	26.5	78.3	62.9
Scholar In-Furrow Spray	0.500	26.5	86.7	68.5
LSD (P=0.05)=		NS	NS	NS

2 CROWNS/PLOT SAMPLED ON MARCH 22, 2006 AND STORED AT 4C.
3 ROOTLETS WERE SEVERED FROM EACH CROWN AND, FROM THE PROXIMAL END, 10 SEGMENTS 10 MM IN LENGTH WERE CUT FROM THE ROOTLET. THE ROOT SEGMENTS WERE SURFACE DISINFESTED FOR 1' IN 95% ETHANOL AND RINSED TWICE IN STERILE WATER PRIOR TO PLATING ON WATER AGAR AMENDED WITH STREPTOMYCIN SULFATE (250 MG/L). THREE DAYS FOLLOWING INCUBATION AT 25C UNDER LIGHTS THE INCIDENCE AND SEVERITY OF FUSARIUM WAS SCORED FOR EACH ROOTLET.
INCIDENCE=PROPORTION OF ROOT SEGMENTS INFECTED
SEVERITY=MM OF ROOT SEGMENT COLONIZED/TOTAL LENGTH OF ROOTLET PLATED

Table 6A. 2006 Asparagus Fusarium Control Trial*
Victoria Island Farms; Victoria Island
(7 weekly harvests)
Asparagus Crown Source: Bob Whitaker Farms

Treatment	Rate Lb A.I./Acre	Yield (Lbs/Acre)	Spear No./Acre	Avg. Spear Size (g.)
Trial Cultivar: UC 157F_1				
Untreated Control	-----	1,394	26,136	24.2
Scholar (50 WP)	0.125 (crown dip)	1,439	26,415	24.7
Scholar	0.250 (crown dip)	1,436	28,924	22.5
Scholar	0.500 (crown dip)	1,359	26,484	23.3
Scholar	0.250 (in-furrow spray at crown planting)	1,579	28,750	24.9
Scholar	0.500 (in-furrow spray at crown planting)	1,394	28,297	22.4
	LSD @ 0.05:	N.S.	N.S.	
	C.V. =	20.4%	13.5%	

Table 6B. 2006 Asparagus Fusarium Control Trial*
Victoria Island Farms; Victoria Island
(7 weekly harvests)
Asparagus Crown Source: Victoria Island Farms

Treatment	Rate Lb A.I./Acre	Yield (Lbs/Acre)	Spear No./Acre	Avg. Spear Size (g.)
Trial Cultivar: UC 157F_1				
Untreated Control	-----	1,624	29,969	24.6
Scholar (50 WP)	0.250 (crown dip)	1,652	30,771	24.4
Scholar	0.500 (in-furrow spray at crown planting)	1,404	26,833	23.8
	LSD @ 0.05:	N.S.	N.S.	
	C.V. =	19.1%	15.7%	

* Trials established with one-year-old asparagus crowns in 2004

2006 Asparagus Centipede Management Trial (Benny Fouché, Alex Acosta).

At the end of 2005, a research trial seeking to control garden centipede (*Scutigerella immaculata*) in asparagus was established at Victoria Island Farms (Graydon Nichols, Jim Jerkovich and Tony Piazza) west of Stockton, California. Two candidate synthetic pyrethroid insecticides – Mustang (beta cypermethrin) and Warrior (lambda cyhalothrin) were injected into the soil through the grower's buried drip irrigation system. During the spring of 2006, asparagus spears were harvested from each plot on seven different weekly dates and then examined for centipede damage (strikes). Results were extremely variable, indicating perhaps that sufficient soil profile wetting did not occur in the Egbert muck soil where centipedes may have been actively feeding on crown roots and/or spears. In other words, placement of the candidate insecticides may have been too deep for good centipede control at harvest. Work will continue in 2007 looking at evaluation after a second set of applications in the summer when the soil surface is dry and centipedes would be deeper in the soil profile and more likely to contact the insecticide treatments. Both of the tested compounds have shown excellent centipede control in other crops such as tomatoes in past trials.

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

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

WARNING ON THE USE OF CHEMICALS

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

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

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

PHYTOTOXICITY

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

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

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