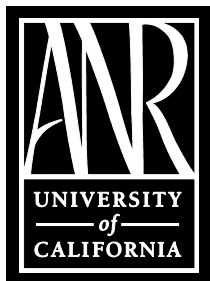


ASPARAGUS

Variety Evaluation & Pest Management
in San Joaquin County



2005 Research Progress Report



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**2005 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: Graydon Nichols and Tony Piazza, Ed Zuckerman and Ken Jochimsen, as well as Cher Watte and the California Asparagus Commission. It is their fine cooperation, financial and in-kind support and patience that benefits 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 2005. This report presents results of asparagus weed 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.

<u>Trade Name</u>	<u>Common or Chemical Name</u>	<u>Manufacturer</u>
Chateau (51WDG)	flumioxazin	Valent U.S.A. Corporation
Devrinol (2E)	napropamide	Zeneca Ag Products
Karmex (80DF)	diuron	DuPont Ag Products
Lorox (50DF)	linuron	DuPont Ag Products
Matrix (25DF)	rimsulfuron	Dupont Ag Products
Prism (0.94E)	clethodim	Valent U.S.A. Corporation
Prowl (3.8CS)	pendimethalin	BASF Corporation
Raptor (1AS)	imazamox	BASF Corporation
Roundup Ultra (5L)	glyphosate	Monsanto Chemical Co.
Sandea (75WG)	halosulfuron	Gowan Chemical Co.
Sencor (75DF)	metribuzin	Bayer Ag Chemicals
Solicam (80DF)	norflurazon	Syngenta Crop Protection

CULTIVAR EVALUATION TRIALS

UC Asparagus Cultivar Evaluation Trial (Victoria Island Farms) – This trial, planted with one-year-old crowns in 1998, was harvested 30 times over a 74-day period. Drip irrigation is being used to supply the majority of the crop moisture requirements of the trial field, as well as serving as a fertilizer delivery system to the plant stand. The trial contains 12 replicated cultivars with another 13 lines in single replication observation plots. Cultivars in the trial are from Dr. Mikeal Roose’s breeding program at UC Riverside, Brian Benson’s private breeding program near Davis, California, and Marc Darbonne’s private breeding enterprise in France. Some stand loss in a couple of the slower growing varieties occurred, during the 1998 trial establishment season, from excessive early filling of the planted trenches with soil, causing smothering of some crowns. This was the seventh full cutting season for this trial and crop production began to fall off significantly from the 2004 season, perhaps due to the buildup of *Fusarium* sp. in the soil and accumulated over-cutting of the trial by the cooperator’s crew after normal research cutting had ended for each season. Yields in the replicated trial were down 25% on average from 2004, with spear size down as well. Still some varieties showed good yields, with the highest yielding cultivar being Atlas at 6, 201 Lbs/Acre, followed by Grande (5,792 Lbs/Acre), UCR 115 (5,101 Lbs/Acre), UCR 65 (4, 781 Lbs/Acre), Apollo (3, 408 Lbs/Acre) and UCR 112 (3,354 Lbs/Acre). Best spear quality was achieved by UCR 115, followed by UCR 60, UCR 87 and UCR 112. Largest spear size (9-inch spear in grams/spear) on average occurred with Atlas, followed by Grande, UCR 65 and UCR 87. There was very little difference between cultivars this year with regard to spear size. This trial will not be continued in 2006. Complete replicated trial data is given in **Table 1**.

In the 13-line observation cultivar block, greatest yield was achieved by Cipres at 7,062 Lbs/Acre, followed by UCR 79 (5,603 Lbs/Acre), UCR 122 (4,530 Lbs/Acre), UCR 96 (4,434 Lbs/Acre), PLA 2232 (3,727 Lbs/Acre), and UCR 107 (3,691 Lbs/Acre). As with the replicated trial, yields were down substantially in the observation lines from the 2004 production season for the same suspected reasons as cited above in the replicated trial discussion. Best spear quality occurred with UCR 79 and UCR 107, followed by Cipres, UCR 109, PLA 2232 and UCR 66. Spear size in the observation block was down overall from 2004, with largest size achieved by UCR 109, Cipres, UCR 96 and UCR 107. The reader of this report is cautioned that data in the observation block is only from one replication of each cultivar. Complete observation data from the Victoria Island Farms trial is provided in **Table 2.**

UC Asparagus Cultivar Evaluation Trial (Zuckerman-Heritage Farms)

This trial was established in 2002 with one-year-old crowns on McDonald Island. The crowns were provided by California Vegetable Specialties (Rich Collins) from their nursery near Delhi, California and some were provided by Ed Zuckerman and Ken Jochimsen from the growers' own crown nursery. The trial contains 12 replicated varieties and another 29 observation lines in single or two-replication plots. Advanced cultivars from Dr. Mikeal Roose's breeding program at UC Riverside, Dr. Steve Garrison's breeding program at Rutgers University in New Jersey and the private asparagus variety development program from Brian Benson at California Asparagus Seed and Transplant near Davis, California make up the trial. The trial was harvested 30 times over a 74-day cutting season. The trial receives most of its moisture and fertility requirements from a buried drip irrigation system and this past season saw little damage from garden centipede as had occurred in a portion of the trial in 2004. Yields were quite good for many of the lines in the replicated trial led, by NJ 953 at 7,188 Lbs/Acre and then followed by Grande (6,500 Lbs/Acre), NJ 977 (6,069 Lbs/Acre), Jersey Supreme (5,808 Lbs/Acre), UC 157F₁ (5,538 Lbs/Acre), UCR 115 (5,181 Lbs/Acre) and Atlas (5,172 Lbs/Acre). Largest spear size was attained by Purple Passion, Grande, Dulce Verde, F586 x M256, Atlas, Apollo and F141 x M256. Best spear quality occurred with UCR 115, F141 x M256, UC 157F₁, and NJ 977. Complete replicated data from the Zuckerman-Heritage Farms trial is shown in **Table 3.**

In the 29-cultivar observation trial, yields were very good with a number of lines. The top yielding variety was F177 x M256 at 7,563 Lbs/Acre, followed by NJ 1021 (7,544 Lbs/Acre), NJ 956 (7,503 Lbs/Acre), NJ 978 (7,023 Lbs/Acre), NJ 1018 (6,740 Lbs/Acre), NJ 982 (6,696 Lbs/Acre), F137 x MCE4 (6,508 Lbs/Acre), FCE1 x M120 (6,356 Lbs/Acre), FCE2 x HMJ (6,352 Lbs/Acre), and FCE1 x M256 (6,305 Lbs/Acre). Largest spear size was attained by F177 x M256, FCE2 x HMJ, FCE3 x M256, FCE7 x M256, F133 x M256, F133 x HMJ, NJ 937, FCE1 x M120 and F172 x M256. Best spear quality was achieved by FCE1 x M256 and FCE3 x M256, followed by F137 x MCE4, F177 x M256, FCE1 x M120, F82-2 x M256, F133 x M256, FCE7 x M256 and F177 x MCE1. Complete observation trial data is contained in **Table 4.**

One of the constant problems observed in local asparagus stand establishment is the use of one-year-old crowns from grower nurseries in the San Joaquin-Sacramento 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*). Because the disease is the most serious pathogen affecting asparagus production worldwide, growers are encouraged to put their own crown nursery plantings in soils without a crop history of asparagus and to fumigate the nursery site ensuring good, clean, healthy crowns for planting in new production beds. The final planting sites for new production beds ideally should also be in ground without an asparagus crop history to reduce chances of asparagus infection from *Fusarium*.

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 157F₁, 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 that was on fumigated ground in 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 site outyielded the same four varieties from the Delta nursery site, where *Fusarium* had been present. A 50-day harvest occurred in this experiment during the 2004 cutting season and generally the same yield trends occurred as had been the case in 2003, except that one variety from the Delta nursery site actually produced significantly better than the same line from the Delhi nursery site. The differences in yield from the other three lines were also reduced comparing 2003 and 2004. The 2005 season in the plot saw a 74-day harvest season with the same general yield trends with two lines (UCR 115 and UC 157F₁) showing significantly better yields from crowns grown at the Delhi nursery site over those grown in the grower nursery in the Delta. For the other two lines, one showed virtually no difference in yield from both nurseries and the other had significantly better yields from the Delta grower nursery over the fumigated Delhi nursery site.

All of this may suggest there is a temporary benefit that occurred from crowns grown on fumigated, non-asparagus history ground at the Delhi site and/or that the trial site at Zuckerman-Heritage Farms may also have had a level of soil-borne *Fusarium* inoculum that existed at trial establishment that has subsequently adversely affected yield in a couple of the tested lines. It still would be recommended to locate nursery sites for asparagus seedlings or crowns on soils with no asparagus crop history and to fumigate those sites. 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 trial harvest results are shown in **Table 5**.

Table 1. 2005 ASPARAGUS CULTIVAR EVALUATION TRIAL *
Victoria Island Farms, Victoria Island

(30 harvests over 74 days)
Replicated Varieties

Cultivar	Yield ¹ Lbs/Acre	No. Spears ¹ per Acre	Average ¹ Spear Wt. (g.)	Spear Quality ² Rating
Atlas	6,201	105,938	26.6	1.90
Grande	5,792	106,722	24.6	1.90
UCR 115	5,101	109,597	21.1	2.08
UCR 65	4,781	88,950	24.4	1.98
Apollo	3,408	65,514	23.6	1.80
UCR 112	3,354	65,776	23.2	2.00
UCR 88	3,329	66,124	22.9	1.85
UCR 82	3,090	62,204	22.6	1.87
UCR 60	2,937	55,931	23.8	2.01
UCR 87	2,791	52,011	24.4	2.01
UC 157F ₁	2,647	56,018	21.5	1.91
UCR 62	1,450	29,377	22.4	1.82
LSD @ 5%:	2,259	34,397		
C.V. =	42.0%	33.2%		

¹ Average of four replications

² Average of 30 harvests:

Rating Scale very good = 2.50
good = 2.25
fair to good = 2.00
fair = 1.75
fair to poor = 1.50
poor = 1.25
very poor = 1.00

* Trial was planted with one-year-old crowns in 1998 and is drip irrigated with a subsurface system

Table 2. 2005 ASPARAGUS CULTIVAR EVALUATION TRIAL *
Victoria Island Farms, Victoria Island

(30 harvests over 74 days)
Observation Varieties

Cultivar	Yield ¹ Lbs/Acre	No. Spears ¹ per Acre	Average ¹ Spear Wt. (g.)	Spear Quality ² Rating
Cipres	7,062	111,165	28.8	2.07
UCR 79	5,603	113,604	22.4	2.10
UCR 122	4,530	84,861	24.2	1.87
UCR 96	4,434	74,923	26.9	1.90
PLA 2232	3,727	67,954	24.9	2.05
UCR 107	3,691	64,817	25.9	2.10
UCR 64	3,184	63,075	22.9	1.82
UCR 69	3,064	70,741	19.7	1.91
UCR 66	3,045	55,060	25.1	2.00
UCR 109	2,056	28,575	32.7	2.07
DA 909	1,924	46,696	18.7	1.81
PLA 2332	507	12,545	18.3	1.85

¹ Average of only one replication

² Average of 30 harvests:

Rating Scale very good = 2.50
good = 2.25
fair to good = 2.00
fair = 1.75
fair to poor = 1.50
poor = 1.25
very poor = 1.00

* Trial was planted with one-year-old crowns in 1998 and is drip irrigated with a subsurface system

Table 3. 2005 ASPARAGUS CULTIVAR EVALUATION TRIAL *
Zuckerman – Heritage Farms, McDonald Island

(30 harvests over 74 days)
Replicated Varieties

Cultivar	Yield ¹ Lbs/Acre	No. Spears ¹ per Acre	Average ¹ Spear Wt. (g.)	Spear Quality ²
NJ 953	7,188	120,574	27.1	1.82
Grande	6,500	82,938	35.6	1.93
NJ 977	6,069	94,961	29.0	1.97
Jersey Supreme	5,808	90,605	29.1	1.75
UC 157F ₁	5,538	85,465	29.4	2.04
UCR 115	5,181	83,897	28.0	2.25
Atlas	5,172	68,738	34.1	1.89
Apollo	5,115	72,397	32.1	1.85
F586 x M256	4,375	56,802	35.0	1.91
F141 x M256	4,351	63,946	30.9	2.13
Purple Passion	3,499	41,295	38.5	1.94
Dulce Verde	1,537	19,602	35.6	1.75
LSD @ 5%:	1,292	18,396		
C.V. =	17.9%	17.4%		

¹ Average of four replications

² Average of 30 harvests:

Rating Scale very good = 2.50
good = 2.25
fair to good = 2.00
fair = 1.75
fair to poor = 1.50
poor = 1.25
very poor = 1.00

* Trial was planted with one-year-old crowns in 2002 and is drip irrigated with a subsurface system

Table 4. 2005 ASPARAGUS CULTIVAR EVALUATION TRIAL *
Zuckerman – Heritage Farms, McDonald Island

(30 harvests - 74 days)
Observation Lines

Cultivar	Yield ¹ Lbs/Acre	No. Spears ¹ per Acre	Average ¹ Spear Wt. (g.)	Spear Quality ³
F177 x M256	7,563	98,620	34.8	2.07
NJ 1021	7,544	114,650	29.9	1.88
NJ 956 ²	7,503	119,355	28.6	1.88
NJ 978	7,023	116,741	27.3	1.85
NJ 1018	6,740	116,392	26.3	1.85
NJ 982	6,696	118,483	25.7	1.82
F137 x MCE4 ²	6,508	98,795	29.7	2.10
FCE1 x M120 ²	6,356	94,612	30.4	2.07
FCE2 x HMJ ²	6,352	83,984	34.5	1.88
FCE1 x M256	6,305	98,968	28.9	2.19
F177 x MCE2	5,840	91,302	29.0	1.88
FCE7 x M256	5,834	81,893	32.3	2.00
F172 x M256 ²	5,723	86,772	30.0	1.88
FCE3 x M256 ²	5,441	72,658	34.2	2.19
NJ 937	5,325	78,408	30.8	1.80
NJ 963	5,286	94,787	25.3	1.65
FCE1 x A1 ²	5,049	81,022	28.3	1.91
F133 x HMJ	5,026	72,484	31.5	1.88
F82-2 x M256	4,595	77,363	27.0	2.07
F133 x M256	4,292	61,681	31.6	2.07
NJ 990	3,979	73,181	24.7	1.65
F177 x MCE1	3,915	85,029	20.9	2.00
NJ 976	3,381	54,014	28.4	1.80

¹ Average of only one replication

² Average of two replications

³ Average of 30 harvests

Rating Scale – very good = 2.50; good = 2.25; fair to good = 2.00; fair = 1.75;
fair to poor = 1.50; poor = 1.25; very poor = 1.00

*Trial was planted with one-year-old crowns in 2002 and is drip irrigated with a subsurface system

Table 5. 2005 ASPARAGUS CULTIVAR EVALUATION TRIAL *
Zuckerman – Heritage Farms, McDonald Island

(30 harvests over 74 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)	5,381 ¹	79,453	30.7	2.00
UCR 115 (McDonald Island)	4,480 ¹	68,999 ¹	29.5	2.07
F141 x M256 (Delhi)	5,352 ¹	74,226 ¹	32.7	1.92
F141 x M256 (McDonald Island)	6,669 ¹	88,862 ¹	34.1	2.00
F586 x M256 (Delhi)	4,843 ¹	67,257 ¹	32.7	1.93
F586 x M256 (McDonald Island)	4,793 ¹	64,817 ¹	33.6	2.00
UC157F ₁ (Delhi)	5,663 ²	97,749 ²	26.3	2.08
UC157F ₁ (McDonald Island)	4,714 ³	78,060 ³ *	27.4	2.01

¹ Average of only one replication

² Average of two replications

³ Average of four replications

⁴ Average of 30 harvests -

Rating Scale – very good = 2.50; good = 2.25; fair to good = 2.00; fair = 1.75;
fair to poor = 1.50; poor = 1.25; very poor = 1.00

*Trial was planted with one-year-old crowns in 2002 and is drip irrigated with a subsurface system

Pest Management Research Trials

A preemergence weed control trial in newly planted one-year-old asparagus crowns.

Robert Mullen, Don Colbert, Randall Wittie and Scott Whiteley

A preemergence weed control trial in newly planted one-year-old asparagus crowns, evaluating five herbicides and/or combination treatments, was established on March 1, 2005, at Victoria Island Farms on Victoria Island, west of Stockton, California. All treatments were applied after the asparagus crowns were planted (February 21, 2005) and covered with three to four inches of soil. A handheld CO₂ backpack sprayer was used with a spray volume of 30 gallons water per acre, 8002 nozzles and Roundup Ultra (glyphosate) at 1.00 Lb/Acre A.I. added to each treatment to remove any emerged weeds. Soil incorporation of the soil surface-applied herbicides was accomplished by winter/spring rainfall. The soil type at the trial site was an Egbert muck. Plot design was a randomized complete block. The field was planted to the asparagus cultivar UC 157F₁. The trial was evaluated for weed control efficacy and crop fern vigor on March 24, 2005 and again on March 31, 2005. Best control of the major weeds present at the time of rating – Italian ryegrass, swamp smartweed, common shepherdspurse and a limited population of wild radish – occurred with the middle rate of Chateau (flumioxazin), followed by the high and low rates of Chateau, and then Prowl (pendamethalin) alone and the combination treatment of Karmex (diuron) plus Prowl. All treatments were very safe to the crop except for some temporary growth suppression that occurred with the high rate of Chateau. Additional notes on weed control by the various treatments on minor populations of other weeds are given below the following table.

2005 ASPARAGUS PREEMERGENCE WEED CONTROL
(Newly Planted One-Year-Old Crowns)
Victoria Island Farms; Victoria Island, California

Treatment	Rate Lb/Ac. A.I.	Weed Control ¹								Crop ¹	
		Italian Ryegrass		Swamp Smartweed		Common Shepherdspurse		Wild Radish *		Fern	Vigor
		<u>3/24</u>	<u>3/31</u>	<u>3/24</u>	<u>3/31</u>	<u>3/24</u>	<u>3/31</u>	<u>3/24</u>	<u>3/31</u>	<u>3/24</u>	<u>3/31</u>
Untreated Control	-----	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3	9.1
Chateau (51WDG)	0.125	8.9	7.9	9.9	10.0	9.9	10.0	9.3	9.3	8.9	8.9
Chateau	0.250	9.8	9.9	10.0	10.0	10.0	10.0	9.9	9.9	8.1	8.4
Chateau	0.375	10.0	9.5	10.0	9.8	10.0	10.0	10.0	10.0	7.1	7.9
Karmex (80DF)	2.000	6.9	7.3	6.8	6.5	9.5	9.9	9.5	9.4	9.1	8.6
Prowl (3.8CS)	4.000	9.8	8.8	9.5	9.3	9.3	8.9	8.4	9.3	9.1	9.0
Karmex + Prowl	2.000 + 4.000	7.6	8.0	9.1	9.1	10.0	10.0	9.3	9.0	8.9	9.3
Karmex + Devrinol (50DF)	2.000 + 2.000	8.1	8.5	7.6	7.6	9.6	9.9	9.1	9.3	9.0	9.0
Karmex + Solicam (80DF)	2.000 + 2.000	7.3	8.4	8.5	8.4	10.0	10.0	8.9	9.0	8.9	8.9

¹ Average of four replications: Weed Control - 0 = no weed control; 10 = complete control
Crop Fern Vigor - 0 = crop dead; 10 = crop growing vigorously

* Light population of wild radish

Notes:

- Chateau, at the low rate, missing a little common purslane
- Karmex alone missing some knotweed and a little volunteer sunflower
- Prowl alone missing a little volunteer sunflower
- Karmex + Prowl missing a little volunteer sunflower and a little common groundsel
- Karmex + Devrinol missing a little volunteer sunflower and knotweed
- Karmex + Solicam missing a little volunteer sunflower and knotweed
- Untreated control missing volunteer sunflower and knotweed and purslane

A postemergence weed management trial in newly planted one-year-old asparagus crowns. Robert Mullen, Don Colbert, Scott Whiteley and Randall Wittie

A postemergence weed management trial in newly planted one-year-old asparagus crowns, evaluating six herbicides and/or combination treatments, was established March 17, 2005 at Victoria Island Farms on Victoria Island, west of Stockton, California. All treatments were applied over the young crop fern and emerged weeds with a handheld CO₂ backpack sprayer using 8002 nozzles and a spray volume of 30 gallons water per acre. The plot design was a randomized complete block and the soil at the trial site was an Egbert muck. The field variety was the asparagus cultivar UC 157F₁. The field was planted on February 21, 2005 with one-year-old asparagus crowns that were then covered with three to four inches of soil shortly after planting. Weeds present at the time of herbicide treatment were one to two-inch rosette common shepherdspurse, one to two-inch tall common lambsquarter, some three to five-inch rosette wild radish, some first true leaf to 1.5-inch rosette swamp smartweed, some cotyledon to 1.5-inch rosette common knotweed and minor populations of 1.5 to 3-inch rosette common sunflower, 2 to 3-inch tall prickly lettuce/annual sowthistle and a few one-inch tall annual bluegrass and common groundsel. The crop fern was 10 to 15 inches tall at the time of treatment. The trial was evaluated for weed control efficacy and crop fern phytotoxicity on March 24, 2005 and again on March 31, 2005. Best control of the major weeds present occurred with the combination of Lorox (linuron) plus Prism (clethodim) plus Crop Oil Concentrate, Sencor (metribuzin) alone and Raptor (imazimox) plus AMS (liquid ammonium sulfate) plus X-77. All treatments were quite safe to the crop with only a very slight amount of fern tip chlorosis with the combination treatment of Matrix (rimsulfuron) plus Sandea (halosulfuron) plus Crop Oil Concentrate. Notes on the activity of the herbicide treatments on the previously mentioned minor population weeds are given after the table below.

2005 ASPARAGUS POSTEMERGENCE WEED CONTROL
 (Newly Planted One-Year-Old Crowns)
 Victoria Island Farms; Victoria Island, California

Treatment	Rate Lb/Ac. A.I.	Weed Control ¹										Crop ¹	
		Common Shepherdspurse		Common Lambsquarter		Wild Radish		Swamp Smartweed		Common Knotweed		Fern	Phyto
		<u>3/24</u>	<u>3/31</u>	<u>3/24</u>	<u>3/31</u>	<u>3/24</u>	<u>3/31</u>	<u>3/24</u>	<u>3/31</u>	<u>3/24</u>	<u>3/31</u>	<u>3/24</u>	<u>3/31</u>
Untreated Control	-----	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.7
Sencor (75DF)	1.00	8.6	8.0	9.1	9.3	9.1	9.9	8.3	8.8	7.8	8.8	0.9	0.9
Raptor (1AS) + AMS* + X-77	0.31 + 4.50 + + ¼%	8.9	9.1	9.3	9.1	6.6	8.9	6.8	7.5	5.6	7.9	1.2	0.9
Lorox (50DF)	1.00	8.5	8.6	8.8	9.1	9.1	9.6	7.3	7.8	3.5	5.5	0.6	0.6
Lorox + Prism (0.94E) + COC**	1.00 + .188 + ½%	9.4	9.4	9.4	10.0	9.3	9.9	8.5	9.5	8.5	9.2	1.1	0.9
Matrix (25DF) + Sandea (75DF) + COC	0.031 + 0.032 + ½%	7.0	8.9	7.0	8.1	8.5	9.1	6.6	7.6	3.8	7.4	1.4	1.1

¹ Average of four replications: Weed Control - 0 = no weed control; 10 = complete weed control
 Crop Fern Phyto - 0 = no crop injury; 10 = crop dead

* AMS = liquid ammonium sulfate

** COC = Crop Oil Concentrate

Notes:

Sencor missing some annual bluegrass and prickly lettuce

Raptor + AMS + X-77 missing some volunteer sunflower and prickly lettuce/annual sowthistle

Lorox missing some annual bluegrass and a little prickly lettuce/annual sowthistle

Lorox + Prism + COC is very clean

Matrix + Sandea + COC missing some volunteer sunflower, a little common groundsel and annual sowthistle

Untreated Control missing prickly lettuce/annual sowthistle, volunteer sunflower and common groundsel

Behavioral Response of European Asparagus Aphid to Foliar Applied Insecticides
Brachycorynella asparagi

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Experimental plots were established at Victoria Island Farms, west of Stockton, California. The purpose of the research was to evaluate the effectiveness of nine different materials for control of European asparagus aphids feeding on asparagus fern. Plot size was 5 feet wide by 40 feet long with 4 replications. The treatments were applied with a CO₂ powered backpack spray boom with the application made from both sides of the bed. A volume of 50 gallons/acre was used in order to simulate the same type of coverage obtained by the grower. Three TJ-60 8002-VS twin even flat spray tips were used to produce fine particle size spray droplets. One application was made on October 5th, 2005.

Materials in Trial

Products	Formulation	Prod/Acre
Untreated Control		
Provado	1.6 F	8 oz.
Assail	30 SG	2.5 oz.
Venom	20 SG	300 gr.
Platinum	21.6 %	8 oz
Fulfill	50 WDG	2.75 oz
Veggie Pharm	5 %	12.5 Gallons
Warrior	11.4 %	3.84 oz
V10170	50 WDG	40 gr
Knack	0.86 EC	16.4 oz

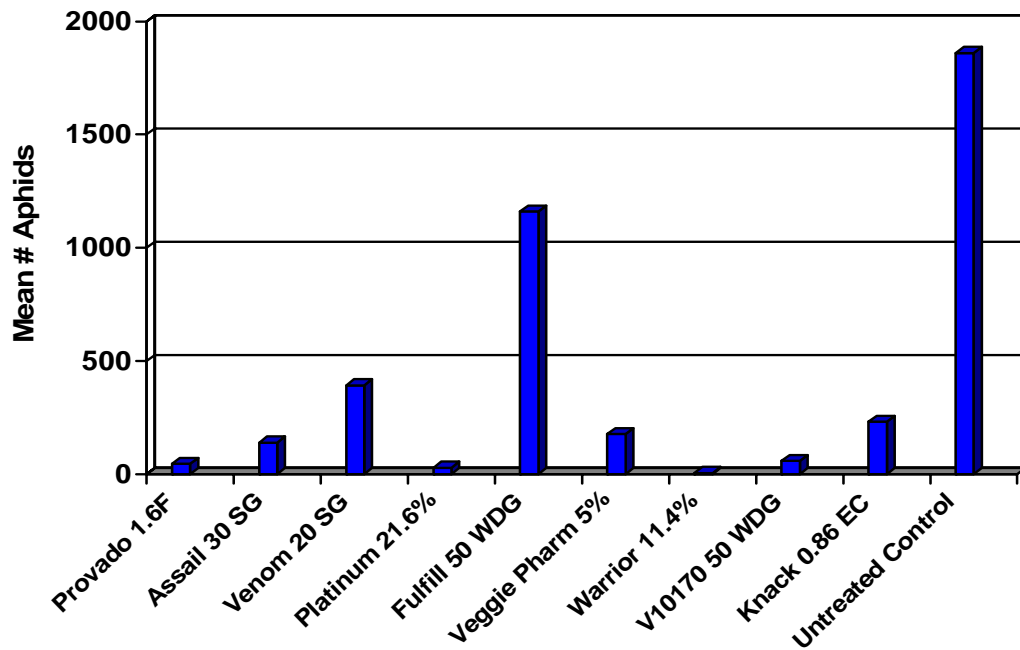
Aphid behavior was evaluated by beating the fern in three areas of the plot in each of 4 replications and rapidly counting aphids observed on an 8½-inch by 11-inch foam board. While many lady bird beetles were observed in this trial, they did not provide adequate control until after the aphid numbers had been at damaging levels for some time in the asparagus fern. Evaluations were made for three consecutive weeks following the application.

Control of European Asparagus Aphid, *Brachycorynella asparagi*, 2005

Products	Formulation	Prod/Acre	Aphids 11 Oct	Aphids 17 Oct	Aphids 27 Oct
Untreated Control			722b	572b	1861c
Provado	1.6 F	8 oz.	189a	87a	45a
Assail	30 SG	2.5 oz.	67a	166a	139a
Venom	20 SG	300 gr.	112a	87a	392a
Platinum	21.6 %	8 oz	83a	81a	28a
Fulfill	50 WDG	2.75 oz	194a	213a	1161b
Veggie Pharm	5 %	12.5 Gal	116a	47a	176a
Warrior	11.4 %	3.84 oz	8a	3a	5a
V10170	50 WDG	40 gr	35a	28a	57a
Knack	0.86 EC	16.4 oz	110a	284a	231a

Means in a column followed by the same letter are not significantly different at the 5% Level. DMR

Mean Number of European Asparagus Aphids, 2005



All materials provided good control of aphids by the end of the trial with the exception of Fulfill. Coverage at 50 GPA was minimal for contact materials and better control could also be expected if air blast type sprayers were used to help penetrate the dense fern.

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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