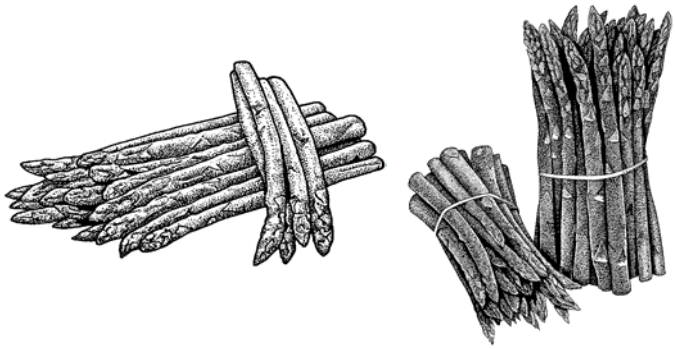
ASPARAGUS

Variety Evaluation & Pest Management In San Joaquin County



1999 Research Progress Report

UNIVERSITY OF CALIFORNIA
COOPERATIVE EXTENSION
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1999 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: Bill Zech, Alan Carlisle and Alistair Hulbert, Bill and Chip Salmon, Ed Zuckerman, Skip Foppiano, and Mark Bacchetti, as well as the California Asparagus Commission. It is their fine cooperation, financial 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 weed management studies conducted in San Joaquin County during 1999. This report presents results of asparagus weed management trials conducted in San Joaquin County. It should not, in any way, be interpreted as a recommendation of the University of California. Chemical or common names of fungicides and herbicides 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 fungicides and herbicides 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
Visor (2E)	thiazopyr	Rohm and Haas Co.
Goal (2XL)	oxyfluorfen	Rohm and Haas Co.
Valor (50 WP)	flumioxazin	Valent U.S.A. Corporation
Karmex (80 WP)	diuron	DuPont Ag Products
Devrinol (2E)	napropamide	Zeneca Ag Products
Permit (75 WG)	halosulfuron	Monsanto Chemical Co and Gowan Chemical Co.
Milestone (80DF)	azafenidin	DuPont Ag Products
Sencor (75 DF)	metribuzin	Bayer Ag Chemical
Lorox (50 DF)	linuron	DuPont Ag Products
Stinger (3 E)	clopyralid	Dow Elanco Chemical Co.
Aim (40 DF)	carfentrazone	FMC Corporation
Authority (75 DF)	sulfentrazone	FMC Corporation

CULTIVAR EVALUATION TRIALS

International Asparagus Cultivar Evaluation Trial II (Augusta-Bixler Farms) – The trial, in its fourth year of harvest, was cut 30 times over 71 days. The trial has 17 replicated lines with another 17 selections in a single replication observation block. Variety selections from Dr. Mikeal Roose's asparagus breeding program at UC Riverside, along with lines from seven foreign countries (Italy, France, Germany, Spain, Holland, New Zealand and Taiwan) and varieties from Rutgers University in New Jersey, are being compared to three selected "standard" cultivars – UC157F_1, Jersey Giant and Gin Lim. Additionally, four private breeder lines from California Asparagus Seed and Transplant (Brian Benson) – Apollo, Atlas, Grande and Purple Passion – are also being evaluated. Production of many of the lines was quite good considering the prolonged cold weather production season that occurred. At least partly due to the cold season, some of the lines performed quite differently from 1998. The highest yielding line in the replicated block was crown planted UC157F_1, at 4,326 Lbs./Acre, followed by seedling planted UCR8 (3,898 Lbs./Acre), UCR7 (3,310 Lbs./Acre), UC157F_1 (3,210 Lbs./Acre), Dariana (3,143 Lbs./Acre), UCR5 (3,118 Lbs./Acre) and Atlas (3,036 Lbs./Acre). It should be noted that figures for UC157F_1 are reported twice because all 17 replicated lines were planted in 1995 using 10-12 week old seedling transplants. An eighteenth line had very low seed germination and so UC157F_1 one-year-old crowns were used as a replacement line to fill out the replicated block. Best spear quality was attained by UC157F_1 (seedling or crown planted), UCR8, UCR5, ASP1 and Atlas. UCR7 and Jersey Giant showed fair to good quality through a good portion of the season. Largest spear size was attained by Purple

Passion, followed by Grande, UCR8 and Dariana. See Table 1 for complete replicated trial results.

In the 17-line observation trial block, with one line (UCR115) repeated to fill out the 18 plots, all lines were planted in 1995 as 10-12 week old seedling transplants. The observation lines were cut 30 times over 71 days. Best yield was achieved by 89P72 at 4,772 Lbs./Acre, followed by 89P58 (4,291 Lbs./Acre), Tainan #2 (4,251 Lbs./Acre), DA911 (4,018 Lbs./Acre), Golia (3,847 Lbs./Acre), Eros (3,599 Lbs./Acre), Ven Lim (3,166 Lbs./Acre) and UCR115 (2,824 Lbs./Acre). Best spear quality occurred with UCR115, DA911, Ven Lim, Tainan #2, Eros, Golia and 89P72. UCR84 had the largest spear size, followed by Golia, 89P72, Eros, 89P58, UCR88 and DA911. Complete observation trial results are presented in Table 2.

UC Asparagus Cultivar Evaluation Trial (Foppiano Farms) – This trial, planted with one-year-old crowns in 1997, was harvested 30 times over 67 days. Yields were reasonably good considering the cold weather production season into late April. The trial has seven replicated lines, including UC157$_{F1}$, from the breeding program at UC Riverside. Highest yield occurred with F597 x M138 (UCR5) at 2,403 Lbs./Acre, followed by F609 x M138 (UCR7) at 2,398 Lbs./Acre, UC157$_{F1}$ (2,215 Lbs./Acre), and F608 x M138 (2,140 Lbs./Acre). All varieties exhibited good spear quality, led by UC157$_{F1}$, F597 x M138 (UCR5), F609 x M138 (UCR7), F189 x HS104 (UCR8) and F608 x M138. UC157$_{F1}$, F597 x M138 (UCR5), F609 x M138 (UCR7), and F608 x M138 were the earliest emerging lines. F189 x HS185 had the largest spear size, followed by F189 x HS104 (UCR8) and F597 x M138 (UCR5). Complete trial data for the replicated trial is shown in Table 3. The observation block consisted of single replications of 12 newer lines from the UC Riverside breeding program. Highest yield was attained by F212 x A1 at 2,468 Lbs./Acre, followed by F137 x L1 (2,343 Lbs./Acre), F189 x A1 (2,231 Lbs./Acre), F145 x A1 (2,200 Lbs./Acre), F109 x E1 (2,051 Lbs./Acre), F212 x H1 (1,782 Lbs./Acre), and F141 x A1 (1,709 Lbs./Acre). F181 x A1, F141 x A1, F189 x A1, and F137 x A1 gave the best spear quality through most of the harvest season. Earliest spear emergence occurred with F145 x A1 and F212 x A1. Largest spear size occurred with F189 x A1, followed by F212 x H1, F141 x A1 and RF110 x A1. Complete observation trial results are presented in Table 4.

UC Asparagus Cultivar Evaluation Trial (Victoria Island Farms) – This trial established in 1998, under drip irrigation, was harvested 22 times over a 52 day period. One-year-old crowns were used to establish the trial, which contains 12 replicated varieties and another 13 lines in a single replication observation block. Considering the cold weather conditions of the 1999 cutting season, a number of lines performed quite well. Some stand loss occurred during 1998 on slower growing lines from excessive early filling of the planted trenches with soil. Highest production in the replicated trial, by a significant amount, was achieved by Atlas at 2,764 Lbs./Acre, followed by UC157$_{F1}$ (1,715 Lbs./Acre), Grande (1,360 Lbs./Acre), UCR115 (1,310 Lbs./Acre), UCR65 (1,211 Lbs./Acre) and UCR112 (1,149 Lbs./Acre). Best spear quality occurred with UC157$_{F1}$, UCR115, UCR87 and UCR60. Atlas, UCR62 and UCR112 also showed pretty good spear quality. The earliest emerging varieties in the replicated trial were UCR62,

UCR65, UCR88, UCR60 and UCR82. UCR87 and UCR115 were also pretty early emerging lines. Largest spear size occurred with Atlas, followed by Grande, Apollo, UCR65 and UCR87. Complete replicated trial data is shown in Table 5. In the observation block, highest yield came from UCR122 at 1,565 Lbs./Acre, followed by UCR69 (1,551 Lbs./Acre), Cipres (1,509 Lbs./Acre), PLA2232 (1,467 Lbs./Acre), PLA2332 (1,425 Lbs./Acre), UCR107 (1,356 Lbs./Acre) and UCR96 (1,342 Lbs./Acre). The earliest emerging observation lines were UCR64 and UCR96. Best spear quality was attained by UCR79, UCR109 and PLA2332, with UCR66 and UCR107 also providing pretty good quality spears. Largest spear size came from PLA H34IA, followed by Cipres, UCR109 and UCR122. Complete observation trial data is given in Table 6.

OTHER ASPARAGUS CULTIVAR EVALUATION TRIALS

A new asparagus cultivar evaluation trial, featuring advanced M256 hybrids and All Male hybrids from Dr. Mikeal Roose's breeding program at UC Riverside, was established with one year old crowns at Victoria Island Farms on March 16, 1999. The trial contains nine replicated M256 hybrids and seven replicated All Male hybrids. Additionally, eight All Male hybrids are in a single replication observation block. The trial will be furrow irrigated and a limited 4-week harvest will occur during the 2000 season.

Adjacent to this trial is a larger companion plot established by Drs. Steve Garrison and Chico Chen of Rutgers University in New Jersey. The trial contains 10 replicated lines that include commercial lines from the Rutgers program, UC157F_1 and Ida Lea from the University of California, and California Asparagus Seed and Transplant. There are another 23 advanced lines, replicated two times, planted with one-year-old crowns. There are also two replications of 22 more advanced selections established with 10-12 week old seedlings. Rutgers University researchers will oversee a limited harvest of the trial in 2000 and the author of this publication will make written observations of the Rutgers material.

Table 1: 1999 INTERNATIONAL ASPARAGUS CULTIVAR EVALUATION TRIAL
AUGUSTA-BIXLER FARMS on UNION ISLAND
Replicated Trial
(30 harvests – 71 days)

Cultivar	Yield [1] (Lbs./Acre)	Spears [1] No./Acre	Average Spear [1] Size (g.)
UC157F_1 (crowns)	4,326	76,012	25.8g
UCR8	3,898	53,071	33.3g
UCR7	3,310	54,886	27.4g
UC157F_1	3,210	57,427	25.4g
Dariana	3,143	42,834	33.3g
UCR5	3,118	50,893	27.8g
Atlas	3,036	46,900	29.4g
ASP1	2,633	43,270	27.6g
Gin Lim	2,580	46,391	25.2g
Grande	2,546	32,017	36.1g
Jersey Giant	2,480	43,415	25.9g
Taramea	2,407	45,520	24.0g
Apollo	2,195	35,211	28.3g
Tie Lim	2,125	31,000	31.1g
Val Prima	1,723	29,839	26.2g
Jersey Gem	1,528	24,611	28.2g
Purple Passion	1,286	15,754	37.1g
Andreas	1,120	17,061	29.8g
LSD @ 5%:	2,225	37,657	
CV =	60.4%	64.0%	

[1]Average of four replications

Table 2: 1999 INTERNATIONAL ASPARAGUS CULTIVAR EVALUATION TRIAL
AUGUSTA-BIXLER FARMS on UNION ISLAND
Observation Trial
(30 harvests – 71 days)

Cultivar	Yield [1] (Lbs./Acre)	Spears [1] No./Acre	Average Spear [1] Size (g.)
89P72	4,772	60,984	35.5g
89P58	4,291	59,822	32.6g
Tainan #2	4,251	89,153	21.6g
DA911	4,018	56,338	32.4g
Golia	3,847	45,012	38.8g
Eros	3,599	46,174	35.4g
Ven Lim	3,166	57,209	25.1g
UCR115[2]	2,824	51,110	25.1g
Cipres	2,729	38,623	32.1g
Argo	2,701	38,623	31.7g
UCR 62	1,911	32,234	26.9g
Jersey Knight	1,857	27,878	30.2g
Huchels L	1,643	29,621	25.2g
UCR65	1,639	23,813	31.2g
UCR60	1,371	20,328	30.6g
UCR88	647	9,002	32.6g
UCR84	473	4,646	46.2g

[1]Average of only one replication
[2]Average of two replications

Table 3: 1999 ASPARAGUS CULTIVAR EVALUATION TRIAL
FOPPIANO FARMS – KING ISLAND
Replicated Trial
(30 harvests – 67 days)

Cultivar	Yield [1] (Lbs./Acre)	Spears [1] (No./Acre)	Average Spear [1] Weight (g)
F597 x M138	2,403	45,912	23.8g
F609 x M138	2,398	51,314	21.2g
$UC157_{F1}$	2,215	44,867	22.4g
F608 x M138	2,140	50,268	19.3g
F189 x HS104	2,099	38,594	24.7g
RF110 x M138	2,087	43,560	21.8g
F189 x HS185	1,998	35,196	25.8g
LSD @ 5%:	NS	NS	
CV =	35.1%	30.9%	

[1] Average of four replications

Table 4: 1999 ASPARAGUS CULTIVAR EVALUATION TRIAL
FOPPIANO FARMS – KING ISLAND
Observation Trial
(30 harvests – 67 days)

"SuperMale" Cultivar	Yield [1] (Lbs./Acre)	Spears [1] (No./Acre)	Average Spear [1] Weight (g)
F212 x A1*	2,468	57,717	19.4g
F137 x L1*	2,343	46,696	22.8g
F189 x A1*	2,231	37,752	26.8g
F145 x A1	2,200	44,257	22.6g
F109 x E1*	2,051	39,688	23.5g
F212 x H1	1,782	32,409	25.0g
F141 x A1	1,709	31,712	24.5g
F109 x A1*	1,588	33,759	21.4g
F181 x A1	1,566	34,151	20.8g
RF110 x A1	1,564	29,621	24.0g
F137 x A1	1,414	29,040	22.1g
F109 x L1	1,358	32,060	19.2g

[1] Average of only one replication
* Denotes cultivar with very limited plant population, so production figures should be viewed with caution

Table 5: 1999 ASPARAGUS CULTIVAR EVALUATION TRIAL
VICTORIA ISLAND FARMS – VICTORIA ISLAND
Replicated Trial
(22 harvests – 52 days)

Cultivar	Yield [1] (Lbs./Acre)	Spears [1] (No./Acre)	Average Spear [1] Weight (g)
Atlas	2,764	34,151	36.7g
UC157$_{F1}$	1,715	34,674	22.5g
Grande	1,360	20,996	29.4g
UCR115	1,310	26,049	22.8g
UCR65	1,211	21,344	25.8g
UCR112	1,149	21,432	24.3g
UCR88	1,136	21,257	24.3g
UCR87	1,107	19,863	25.5g
Apollo	1,034	16,466	28.5g
UCR82	849	16,379	23.5g
UCR60	786	16,814	21.2g
UCR62	708	13,416	24.0g
LSD @ 5%:	630	9,517	
CV =	34.7%	30.2%	

[1] Average of four replications

Table 6: 1999 ASPARAGUS CULTIVAR EVALUATION TRIAL
VICTORIA ISLAND FARMS – VICTORIA ISLAND
Observation Trial
(22 harvests – 52 days)

Cultivar	Yield [1] (Lbs./Acre)	Spears [1] (No./Acre)	Average Spear [1] Weight (g)
UCR122	1,565	28,575	24.9g
UCR69	1,551	34,500	20.4g
Cipres	1,509	23,348	29.3g
PLA2232	1,467	27,181	24.5g
PLA2332	1,425	33,454	19.3g
UCR107	1,356	25,091	24.5g
UCR96	1,342	28,227	21.6g
UCR109*	1,336	21,780	27.8g
PLA H34IA*	1,293	18,094	32.4g
UCR79	1,289	26,833	21.8g
UCR66	1,042	24,045	19.7g
UCR64	1,000	21,954	20.7g
DA909	896	21,606	18.8g

[1] Average of only one replication
* Indicates cultivar with limited plant stand; yields should be viewed with caution

1999 UC ASPARAGUS CULTIVAR EVALUATION TRIAL
VICTORIA ISLAND FARMS – VICTORIA ISLAND

REPLICATED LINES – M256 HYBRIDS

1. F82-2 x M256
2. F132 x M256
3. F137 x M256
4. RF135 x M256
5. F172 x M256
6. F177 x M256
7. F184 x M256
8. F189 x M256
9. F584 x M256

REPLICATED LINES – ALL MALE HYBRIDS

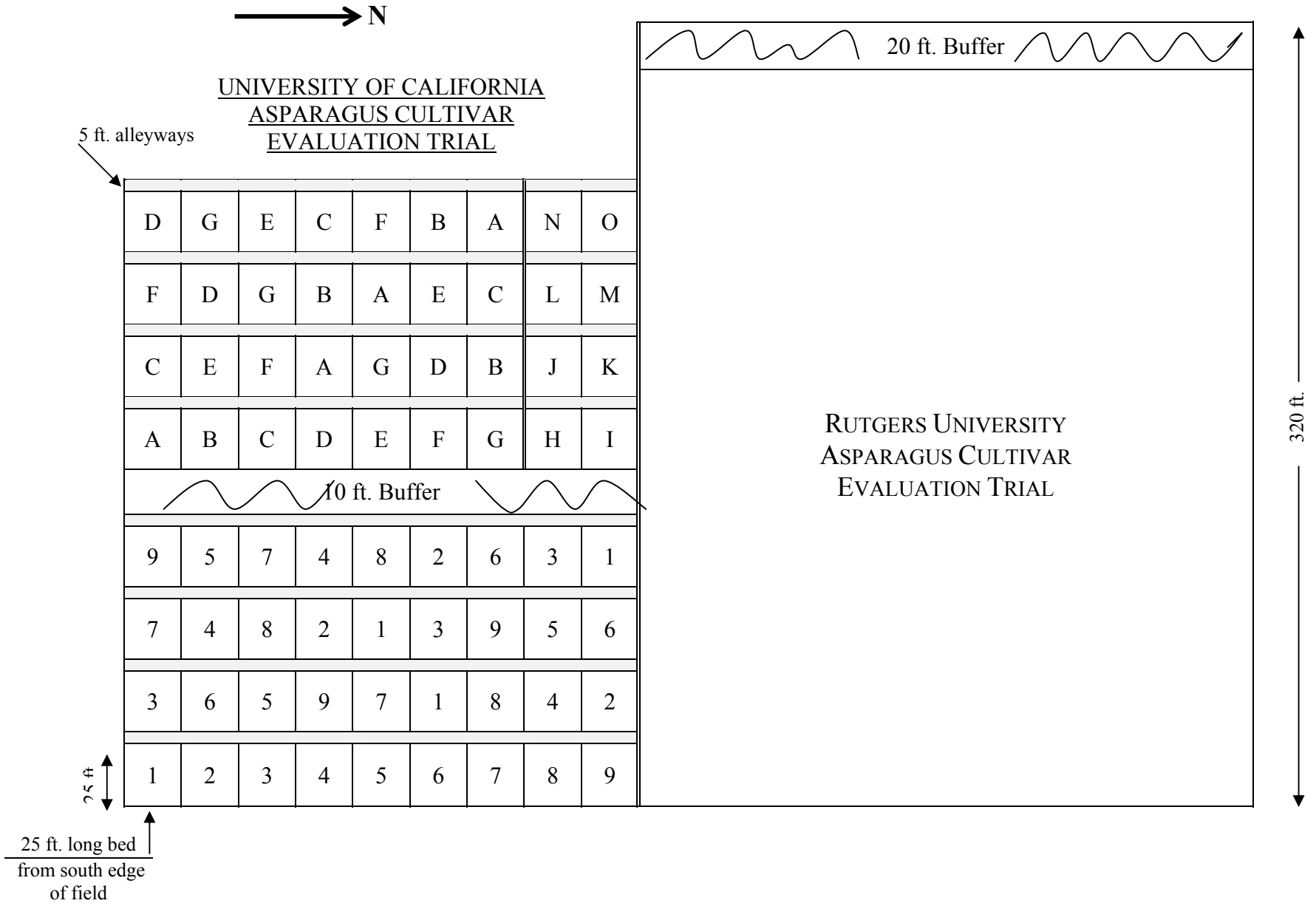
A. F82-2 x L1
B. RF110 x L1
C. F181 x L1
D. F181 x C453
E. F181 x C458
F. F600 x C452
G. F600 x L1

OBSERVATION LINES – ALL MALE HYBRIDS

H. F82-2 x C453
I. F82-2 x C458
J. RF110 x C458
K. F133 x C451
L. RF139 x L1
M. F177 x L1
N. F181 x C452
O. F600 x C453

Date crowns planted: March 16, 1999
Field Variety: $UC157_{F_1}$

VICTORIA ISLAND FARMS



Pest Management Research Trials

A preemergence weed control trial in newly planted asparagus. Robert Mullen.

A preemergence weed control trial in newly planted one-year-old asparagus crowns, evaluating nine herbicides and/or combination treatments, was established on March 2, 1999, at Victoria Island Farms west of Stockton, California. All treatments were applied with a handheld CO_2 backpack sprayer in a spray volume of 30 gallons per acre. Soil incorporation of the herbicides was accomplished by a combination of winter rainfall and sprinkler irrigation. The soil type at the trial site was an Egbert muck. Plot design was a randomized complete block. The trial was evaluated for weed control efficacy and crop fern vigor on May 4, 1999. Cold weather conditions during March and much of April slowed weed and crop growth. Best weed control of the volunteer sunflower, swamp smartweed, and common lambsquarter occurred with Valor (flumioxazin), followed by Permit (halosulfuron) and Milestone (azafenidin). All other treatments were only partially effective on volunteer sunflower and the combination of Karmex (diuron) plus Devrinol (napropamide) only provided marginal control of swamp smartweed. None of the treatments caused injury to the crop, although there appeared to be a very slight slowdown in asparagus growth with the combination of Visor (thiazopyr) plus Goal (oxyfluorfen).

1999 ASPARAGUS PREEMERGENCE WEED CONTROL
(NEWLY PLANTED CROWN BEDS)
VICTORIA ISLAND FARMS – VICTORIA ISLAND

Treatment	Rate lb or oz/A	Weed Control[1]			Crop[1] Fern Vigor
		Volunteer Sunflower	Swamp Smartweed	Common Lambsquarter	
Aim (40DF)	0.10 lb	7.0	8.4	8.1	8.1
Aim	0.20 lb	7.0	8.8	8.3	8.4
Authority (75DF)	0.50 lb	6.3	8.1	9.5	8.4
Authority	1.00 lb	7.0	9.5	10.0	8.6
Visor (2E)	1.00 lb	6.3	8.4	10.0	8.6
Goal (2XL)	0.25 lb	6.5	8.9	9.5	8.8
Visor + Goal	1.00 lb + 0.25 lb	7.5	9.6	9.5	7.9
Permit (75WG)	1.33 oz	9.5	9.3	9.5	8.1
Milestone (80DF)	0.50 lb	8.6	9.6	10.0	8.4
Valor (50WP)	0.375 lb	9.8	9.9	10.0	8.3
Karmex (80WP) + Devrinol (2E)	2.00 lb + 2.00 lb	7.8	7.1	10.0	8.3
Untreated control	__	1.3	1.8	2.0	8.6

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

Notes:
1. Aim missed knotweed, redroot pigweed, and curly dock
2. Authority also missed knotweed and redroot pigweed
3. Goal missed the small amount of chickweed present
4. The untreated control had some knotweed, curly dock, and redroot pigweed present.

Postemergence weed control in newly planted asparagus. Robert Mullen.

A postemergence weed control trial in newly planted one-year-old asparagus crowns, evaluating five herbicides, was established on April 12, 1999, at Victoria Island Farms west of Stockton, California. All treatments were applied with a handheld CO_2 backpack sprayer in a spray volume of 30 gallons/Acre. The soil type at the trial site was an Egbert muck and the plot design was a randomized complete block. Weeds present at the time of treatment included first true leaf to 14 inch tall volunteer sunflower, second true leaf to 6 inch tall swamp smartweed, two to five inch tall common lambsquarter, some 3 to 6 inch rosette common knotweed, and a limited population of 4 to 6 inch rosette curly dock. The asparagus crop fern was 6 to 18 inches tall. The trial was rated for weed control efficacy and crop fern phytotoxicity on April 22, 1999 and again on May 4, 1999. Best weed control of all weed species presents occurred with Sencor (metribuzin). Lorox (linuron) plus crop oil concentrate was weak on common knotweed and swamp smartweed, with only fair activity on volunteer sunflower. Stinger (clopyralid) was only effective in controlling volunteer sunflower. Permit (halosulfuron) plus crop oil concentrate was weak on common knotweed and swamp smartweed with only fair activity on common lambsquarter. Shadeout (rimsulfuron) plus crop oil concentrate was weak on common knotweed with only fair activity on common lambsquarter, swamp smartweed and curly dock. Some fern phytotoxicity occurred with Stinger and Shadeout plus crop oil concentrate. All other treatments provided good crop safety.

1999 ASPARAGUS POSTEMERGENCE WEED CONTROL
(NEWLY PLANTED CROWN BEDS)
VICTORIA ISLAND FARMS – VICTORIA ISLAND

Treatment	Rate lb or oz/A	WEED CONTROL RATINGS											
		Volunteer Sunflower		Swamp Smartweed		Common Lambsquarter		Common Knotweed		Curly Dock (light stand)		Crop Fern[1] Phyto	
		4/22	5/4	4/22	5/4	4/22	5/4	4/22	5/4	4/22	5/4	4/22	5/4
Sencor (75DF)	1.00 lb	8.6	8.0	8.0	8.3	9.9	10.0	5.3	7.5	8.5	8.9	1.3	0.6
Lorox (50DF) + COC	1.00 lb	7.8	7.4	6.3	6.6	9.9	10.0	6.6	6.5	8.9	9.1	1.1	1.0
Stinger (3E)	0.25 lb	7.8	8.8	5.5	4.8	4.0	5.0	4.0	3.5	4.0	4.3	3.4	3.3
Permit (75WG) + COC	1.00 oz + ½ %	8.5	8.9	6.0	5.3	4.3	7.0	4.5	4.0	8.3	8.5	1.5	0.7
Shadeout (25DG) + COC	1.00 oz + ½ %	9.3	9.1	6.5	7.3	5.3	7.3	4.3	4.0	8.8	7.3	2.8	2.8
Untreated Control	-----	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.5

[1]Average of four replications:
Weed Control – 0 = no weed control; 10 = complete weed control
Crop Fern Phyto – 0 = no crop damage; 10 = crop dead

1. Sencor missing a little annual sowthistle present but picked up a limited population of London rocket.
2. Stinger missed wild radish and London rocket.
3. Permit missed sowthistle and gave partial control of common groundsel and London rocket.
4. Shadeout provided partial control of wild radish but missed sowthistle.
5. The untreated control had a limited population of wild radish, London rocket, annual sowthistle and common groundsel

A postemergence nutsedge management trial in established asparagus. Robert Mullen.

A postemergence nutsedge management trial in post-cutting season established asparagus, evaluating different rates of Permit (halosulfuron) plus X-77 spreader, was put at Marca Bella Farms northwest of Tracy, California, on July 14, 1999. All treatments were applied with a handheld CO_2 backpack sprayer in a spray volume of 30 gallons per acre. The soil type at the trial site was a Sacramento clay/Piper sandy loam mix and the plot design was a randomized complete block. Yellow nutsedge present at the time of treatment was at the 4 to 9 true leaf stage of growth (4 to 18 inches tall). Weed control efficacy and crop fern phytotoxicity ratings were made on August 10, 1999. All rates of Permit (halosulfuron) plus X-77 gave good to excellent suppression and/or control of yellow nutsedge if the weed stage of growth was less than 6 inches tall. Greater than 6 inches tall, best suppression/control of yellow nutsedge occurred with the high rate of Permit plus X-77. The original goal of the trial was to compare two applications of each rate tested to one application. However, an inadvertent cultivation of the trial prior to the second set of applications rendered that effort impossible. All of the single treatments showed great safety to the asparagus crop fern. Next year's trial will investigate single vs. multiple applications of Permit along with any other promising herbicides on the post-cutting season nutsedge problem in established asparagus.

1999 ASPARAGUS YELLOW NUTSEDGE MANAGEMENT TRIAL
MARCA BELLA FARMS – NORTHWEST OF TRACY, CA

		Yellow Nutsedge Suppression[1]		
Treatment	Rate lb/A a.i.	0 to 6 inches tall	> 6 inches tall	Crop[1] Fern Phyto
Permit (75WG) + X-77	0.023 + ¼%	8.3	6.5	0.7
Permit + X-77	0.032 + ¼ %	8.6	7.3	0.7
Permit + X-77	0.047 + ¼ %	8.8	7.4	0.7
Permit + X-77	0.065 + ¼%	9.0	7.7	0.7
Untreated control	__	3.5[2]	2.3[2]	0.6[2]

[1]Average of eight replications:
Weed control – 0 = no weed control; 10 = complete weed control
Crop Fern Phyto – 0 = no crop damage; 10 = crop dead

[2]Average of only four replications

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 RESONSIBLE** 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 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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