

Evaluation of Asparagus as a New Commercial Crop for Hawai'i



Susan Schenck (Hawai'i – Research & Education Grant)

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Title: Evaluation of Asparagus as a New Commercial Crop for Hawai'i

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Principal investigator Susan Schenck and cooperar farmer Milton Agadar assess asparagus plants.

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Introduction:

Hawai'i's agriculture in recent years has become more diversified as two major crops – sugarcane and pineapple – have downsized. The state and its farm industry could benefit from local production of vegetables and greens to replace those supplied by imports. For these reasons, the project team hoped to adapt asparagus, a temperate crop, to Hawai'i's subtropical environment by selecting suitable varieties and determining suitable cultural practices.

Asparagus has several advantages:

- It is a perennial crop with a dense root mat providing good ground cover and reducing erosion.
- It is one of the few vegetables that grows well in brackish water.
- It has few pest or disease problems.
- Once established, it can continue to produce for 10-15 years.

With Hawai'i's 12-month growing season, asparagus produces two crops a year, with sequential harvest schedules for a continuous supply. Instead of a winter dormancy period, growth is arrested by withholding irrigation to allow ferns to die back.

Under subtropical conditions, a question is whether good production could continue for many years before replanting is necessary.



Yield data are gathered on asparagus production.

Objectives:

1. Establish the appropriate irrigation and fertilizer practices
2. Determine plant density for commercial production
3. Manage pests and diseases with minimum pesticides
4. Select the best asparagus cultivars
5. Determine the cost of production, yields and profitability
6. Disseminate this information to Hawai'i's farm community

Procedures:

Eight different all-male varieties were planted in a half-acre plot on Milton Agader's farm: three New Jersey varieties, Jersey Gem, Jersey General and Jersey Giant, and five California varieties, Atlas, Apollo, Purple Passion, Grande and UC 157.

Seeds were started in seedling trays in commercial potting soil and transplanted in a randomized complete block with 12 replications per cultivar. Planting was in four 10-foot rows per plot with 5 feet between rows and 1 foot between plants in rows. Rows were covered with polyethylene mulch that kept weeds in check until ferns closed in. Water was applied in a single drip line per row for 14 hours every other day. Fertilizer was applied through drip lines as 11-37-0 and liquid urea.

Ferns were allowed to grow for one year before the first harvest in December 1997. First-year yields were relatively small, but yields increased in subsequent harvests in August 1998, January 1999 and August 1999. Yield data were taken from one row of each variety plot – the rest was harvested for sale by the farmer – for numbers and weights of small, medium and large spears. In the first year, an outbreak of Cercospora fungus blight required treatment with Dithane fungicide, but no further disease problems were encountered.



Schenck in the lab.



Asparagus plots were laid out in complete randomized plots with 12 replications per cultivar.

Results:

The irrigation and fertilization practices proved suitable for asparagus production in Hawai'i's subtropical environment. Instead of winter dormancy, water was withheld for about three weeks every six months, allowing ferns to die back. When irrigation and fertilization resumed, spears sprouted and were harvested for two to three weeks before size diminished and the ferns were allowed to mature. By drying out different sections at successive intervals, continual production was maintained. After the first year, each plot yielded two harvests a year.

For each variety from each harvest, yields were averaged for these size categories in inches of diameter:

- Small = 1/4 to 3/8
- Medium = 3/8 to 5/8
- Jumbo = > 5/8
- Culls = < 1/4 (culled and not counted)

Overall, California varieties yielded the greatest (varieties bred in California are probably better suited to the warm Hawai'i climate), with Atlas and Apollo having the highest yields. Jersey Giant consistently produced the greatest weight of small spears, which are preferred by many hotel and restaurant chefs and bring the highest price. Purple Passion produced many jumbo spears, and while its purple color is attractive to buyers, it had a higher percentage of misshapen spears.

Asparagus yields from four harvests presented as estimated pounds per acre per variety for all marketable spear sizes combined.

harvest 1		harvest 2		harvest 3		harvest 4	
variety	total wt.	variety	total wt.	variety	total wt.	variety	total wt.
Jersey Gnl	315 a	Jersey Gnl	1575 a	Purple Pas	570 a	Purple Pas	1988 a
Purple Pas	315 a	Purple Pas	1675 ab	Jersey Gnl	890 b	Jersey Gnl	2115 a
Jers Gem	385 ab	Jers Gem	1800 abc	Grande	1055 bc	Jers Gem	2398 ab
Grande	505 abc	Grande	1975 abcd	Jers Gem	1065 bc	Jers Giant	2453 ab
Jers Giant	525 bc	Jers Giant	2080 bcd	UC157	1080 bc	UC 157	2511 ab
UC 157	665 cd	UC 157	2225 cd	Jers Giant	1210 bc	Grande	2620 ab
Atlas	715 d	Atlas	2340 de	Atlas	1340 cd	Atlas	3001 bc
Apollo	750 d	Apollo	2725 e	Apollo	1540 d	Apollo	3514 c

Conclusions:

The project showed Hawai'i growers cultural practices for successfully growing asparagus under subtropical conditions. The cooperating farmer has expanded production to 65 acres, and at least one grower is producing organic asparagus. Both have found markets for all they can produce. Many home gardeners attended field days, but it is not known how many are growing asparagus.

The early plantings continue to be productive after 5-10 years, although yields have not been sustained at the initial high level. While Apollo was the highest yielding cultivar, excellent new varieties have since been developed.

Diseases and pests have not been a problem, but weeds are difficult to manage between the time the ferns die back and before they reach full maturity. Cover crops planted between beds are being assessed for keeping weeds in check.

Hawai'i's high cost of production, particularly labor costs for hand harvesting, make local asparagus more expensive than that imported from Mexico and other places. But consumers seem willing to pay for the quality and freshness, and chefs especially like the spears of smaller diameter.



A field day at the experimental plots.