

Research Note

SEED PRODUCTION OF ASPARAGUS (*ASPARAGUS OFFICINALIS*) IN PUERTO RICO^{1,2}

The feasibility of producing hybrid asparagus seed for the U.S. market was studied in the semiarid southern region of Puerto Rico. Asparagus is a high value crop in the United States. U.S. production levels, however, have declined mainly because of root rot (*Fusarium oxysporum*) and rust (*Puccinia asparagi*). Three parental clones (lines 51 and 56, females; and line 22-8, male) were obtained from tissue culture at Rutgers University, New Brunswick, N. J. and planted at the Fortuna Substation. They were selected because of high-yield, vigor, spear size, rust resistance and tolerance to root rot. They were planted in mid 1982 in a San Antón soil (Cumulic Haplustolls, fine-loamy, mixed, isohyperthermic), pH 7.3 to 7.5. About 0.8 ha was planted in rows 150 m long, with 1.5 to 1.9 m between rows and 0.60 m apart within the row³. The planting system was as follows: 20 rows of line 56 and five of line 51 with six rows of line 22-8 (male) distributed between the two female lines. Crowns were planted 15 to 20 cm

deep. A pre-emergent herbicide (Sencor 50% WP)⁴ was applied at planting at 1 to 1.7 kg/0.4 ha. Postemergent herbicide⁶ (Sencor or Lexone 0.90-1.30 kg/0.4 ha; Gramaxone 1 to 2 quarts/0.4 ha) was applied as needed. A 60 cm rototiller was used to control weeds between rows. Irrigation was applied to favor crown germination and thereafter as necessary. After germination and at 4 months, a 10-10-8 fertilizer was applied at the rate of 3,175 to 3,629 kg/0.4 ha.

The first seeds were manually harvested at 8 months and monthly thereafter until June 1986. Total seed production of both hybrids amounted to 1029 kg for a 3 1/2 year period. Production per year was as follows:

Time	Seed yield, kg/ha
March - December 1983	375.61
January - December 1984	429.41
January - December 1985	376.47
March - June 1986	221.18

The following tabulation shows total production of each hybrid per year. The cross

¹Manuscript submitted to Editorial Board 29 April 1987.

²This study was conducted under SP-90, "Asparagus Seed Production in Puerto Rico" in cooperation with Rutgers University, New Brunswick, N. J. The author thanks William Pagan and Lourdes Castro Rivera for their involvement during the initial stages of the investigation. Thanks are due to Drs. R. Pollack, Melvin Henninger and H. Ellison, from Rutgers University, for their professional and financial support.

³Establishing the commercial asparagus plantation. Division of Agricultural Sciences, Univ. of California. Leaflet 21165, 1980.

⁴Trade names are used in this paper solely for the purpose of providing specific information. Mention of a trade name does not constitute a guarantee of the equipment or material by the Agricultural Experiment Station of the University of Puerto Rico or an endorsement over other equipment or material not mentioned.

⁶Commercial Vegetable Production recommendations. Extension Bulletin 406, Rutgers University, N.J.

51 × 22-8 produced the most seed. Both hybrids produced the highest yields from October to February.

Year	Hybrid	
	Line 56 × 22-8	Line 51 × 22-8
	kg/ha	kg/ha
1983	347.37	628.57
1984	520.00	721.43
1985	296.10	657.14
1986	223.64	321.43

The most common insects observed attacking asparagus stems, sprouts and berries were *Diaprepes abbreviatus* and the fall armyworm (*Laphygma frugiperda*). Lanate at the rate of 224 g/380 L water controlled both insects. The mite *Brevipalpus obovatus* attacked the bearing branches, but applications of Kelthane EC at the rate of 500 cm³/380 L water effectively controlled it.

Major factors in the production of asparagus seed in southern Puerto Rico are timely irrigation, judicious fertilization, and adequate weed control. Asparagus seed production requires about 1520 mm rain per year. In southern Puerto Rico, 50% of the water requirement must be supplied through irrigation. Lack of water leads to dehydration of the berries, each of which

contains 3 to 4 seeds. When water is lacking, no new stems develop and seed production is adversely affected. Intensive rainfall, on the other hand, leads to lodging, which decreases seed yields. If N, P or K are limited, low seed production can be expected. The root system of the asparagus plant is shallow and fibrous. Fertilizer should be applied 30 to 37 cm from the stems. To minimize weed competition, the use of a small rototiller between rows is advisable. In addition, several herbicides (Sencor, Round-Up and Lexone) are effective if carefully applied with a hand roller, avoiding contact with the asparagus stems.

Seed bearing branches are hand-harvested, berries separated in a cleaning machine and the seed extracted by liquefaction.

On the basis of the yield data obtained and considering the favorable conditions prevailing in southern Puerto Rico, the production of asparagus seed from the lines tested appears to be technically feasible. The high value of the asparagus crop creates demand for good quality seed. To cover that demand, the southern region could develop economically feasible seed production programs as herein described.

Octavio Colberg-Rivera
Department of Horticulture