

Asparagus Plant Breeding

a commercially desirable new strain can be developed only after a minimum of eight to ten years of testing

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Asparagus breeding is a long-term research activity. Not until eight to ten years after a cross has been made is the plant breeder able to determine whether he has been successful in combining the characteristics of the male and female parents in the way that he hoped. Meanwhile daily yield records must be taken from harvests during a two- to three-month period each spring. These must include the number and size of all spears produced by every plant, as well as a catalog of various desirable characteristics. Individual plant records show a wide variation between plants in these characters.

In the past, asparagus plant breeders have made little effort to develop uniform strains. One reason for this is that comparative yields between plants can be made only by daily individual plant records during the harvest which extends over a long season. Another reason is that the sexes are in different plants, and any seed produced is a cross between plants. Thus seed from a female plant will not produce uniform plants. Considerable improvement can be made in the first generation where the parent plants are similar in most of their characters.

An asparagus bed should last 10 years or more before annual yields tend to diminish greatly. Individual plants and strains differ markedly in this respect. Short-lived plants or strains may be very productive for five or six years and then

decline below commercial levels. Because of the high cost of developing an asparagus planting, it is desirable that high productivity continue as long as possible. To avoid this hazard of short life, long-time records of plants used for breeding must be kept.

In selecting parent plants a number of criteria are used. These are signposts serving to indicate potentialities that the breeder wants to bring together in his new variety. Plants which rapidly make a wide-spread crown, start producing spears early in the spring, have spears of large diameter year after year, produce many spears each year, and have tight tips which do not separate until the spear has reached a considerable height are likely to be able to transmit these good characteristics to their offspring. Other desired characteristics are proper dark green color without an excessive overlay of purple tinting, the ability to develop well in soil that may be infested with certain diseases, and even the possibility of being resistant to the conditions that generally make replanting of old asparagus land an unsatisfactory procedure.

In 1929, 400 acres of asparagus plantings of the Mary Washington variety in the Sacramento-San Joaquin Delta region were searched for ideal plants. Out of the approximately million plants examined, 159 were selected. Of these only one has stood the test of time. It is now 24 years old. These plants were lifted

from the asparagus fields and brought to Davis where records and notes were taken on their productiveness for 11 years. Many were used in making crosses but only three males and two females have really proved of value as parents.

The outstanding male plant, identified as D-37, was used in the cross that gave rise to strain 500, currently on trial throughout the world. After 24 years this plant is a prolific producer of good sized asparagus spears, with vigorous fern growth during the noncutting season.

Currently there is considerable interest in a close-culture method of growing asparagus in which the seed is planted where the crop is to grow. No replanting of crowns is practiced as in the normal method. In anticipation that a new type of asparagus might be needed—one that would produce a spear of satisfactory diameter under the highly competitive conditions of close spacing—a breeding program has been initiated to combine the vigor of D-37 with the extremely large spear size shown by a couple of female plants, daughters of D-37.

It will be some time before it can be told for certain whether this new job of tailoring an asparagus variety for a specific purpose has succeeded.

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Profuse development of fern growth, left, and spears, right, by plant D-37 at 24 years of age.

