Breeding New Disease-Resistant Cantaloup

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Cantaloupes are being improved for Arizona growers in two important ways. Success in the goals outlined below will improve the crop greatly in areas where cantaloupes are still being grown and will do much toward restoring lost acreage in older regions.

Crown Blight Resistance

The primary objective of the breeding work is development of resistance to crown blight, the most serious disease of cantaloupes in the Southwest. Until resistance to this disease has been perfected, other improvement programs involving performance and quality characteristics will receive only limited attention. In some areas of Arizona cantaloupes cannot be grown profitably because of crown blight.

Over 600 cantaloupe varieties and strains from all over the world have been tested for several years in a search for crown blight resistance. Many hundred more special stocks from the University of Arizona breeding program have been evaluated for their tolerance to the disease. Of the commercial varieties available now, P.M.R. 450 seems to fare best when crown blight strikes. Even this variety will not insure a crop in severely affected fields.

Wide Search for Resistance

Several breeding stocks and hybrids have been bred to resist crown blight to a considerable degree—much better than P.M.R. 450. Some of these are fair marketable types, others are almost inedible. All will need improvement in horticultural characteristics before they will be of value to Arizona growers. Lines with Arizona Sunrise variety as one parent carry some of the highest degrees of resistance. Other strains are being crossed with acceptable types to improve quality.

Inheritance of the desirable resistance character is complex and the resistance will be difficult to maintain. A five-fold breeding effort (two locations, two crops a year, plus greenhouse) should produce an acceptable crown blight-resistant variety soon.

Powdery Mildew Resistance

Powdery mildew is another important disease of muskmelons in Arizona. It usually appears every season and makes necessary an expensive but not entirely successful fungicide spray or dust program. The varieties P.M.R. 45 and P.M.R. 450 were developed to resist the disease. However, they succumb to a certain form of powdery mildew now common in Arizona.

Varieties P.M.R. 5 and P.M.R. 6 are practically immune to both forms of powdery mildew but they are not adapted to Arizona conditions and P.M.R. 6 is very susceptible to crown blight.

The U.S. Department of Agriculture has furnished to the University of Arizona breeding program several stocks which carry near-immunity to powdery mildew. These are being used to develop resistant varieties suitable for Arizona. Both the greenhouse and field plots are used to test and breed this material.

Success has been partly achieved in the development of powdery mildew-resistant Arizona Sunrise as one of the main goals in the project. New varieties resistant to both crown blight and powdery mildew are receiving major emphasis in the improvement program.

Since both of the objectives of the cantaloupe breeding program conducted by the Horticulture Department, University of Arizona, involve diseases, the Plant Pathology Department and the United States Department of Agriculture are cooperating. These cooperating groups are studying the diseases and have contributed resistant stocks for breeding.