

Cantaloups RESISTANT to Crown Blight

By R. E. Foster

Department of Horticulture

Considerable progress has been made in the University of Arizona's cantaloup breeding program. One of the breeding strains is now resistant to crown blight to the point that, even in reasonably heavy crown blight years, it could be harvested for ten additional days after PMR 45 is abandoned to the disease. In plots not severely affected by crown blight, this variety produces the same as PMR 45 in regard to both number of fruit and size of fruit.

This strain shows no difference to PMR 45 in external shape of the fruit nor in blossom-end thickness of the flesh, rind thickness, cavity dryness, flesh firmness, net thickness, net density, or the sutures. The Arizona strain has a narrower cavity and is significantly higher in sugar content. This particular strain needs only to be stabilized before it can be released to Arizona growers and with an intensification in the breeding program, this could be done in one or two years.

Crown Blight Serious Problem

Behind this progress toward crown-blight-resistant melons is the story of the seriousness of crown blight of muskmelons. Crown blight of muskmelons has been described as the worst disease of cantaloups in Arizona (Progressive Agriculture, Vol. 6, No. 1, 1954). The severity of crown blight may vary from year to year, but each year growers lose melons, and in severe cases up to two-thirds of the crop may be destroyed. With the dying of the center or crown leaves of the plant, not only is the normal development of the fruit impaired, but those fruit that attain marketable size are exposed and may become unmarketable because of sunburn.

Crown blight occurs in all of the cantaloup growing areas of Arizona and is an important problem in Imperial Valley, California. In 1952 the disease became serious in Arizona and in 1953 concentrated research was begun by the University of Arizona in cooperation with the University of California and the U. S. Department of Agriculture.



Crown blight resistant cantaloup strain on the right compared to susceptible strain on the left.

Cooperative research has been continued by these institutions and specialists are investigating various phases of the physiology, pathology, entomology, and biochemistry of the disease. So far no measures have been found to control the disease. Fortunately, according to tests conducted since 1952, there is some hope for the control of cantaloup crown blight through the use of varieties apparently resistant to the disease.

Tests Show Differences

Seven cantaloup variety trials were conducted by the University of Arizona in 1952,* 1953,* and 1954 and in each test, Arizona breeding stocks were compared with the standard commercial varieties. Crown blight occurred in each one of the tests. In all of the tests the University of Arizona breeding strains showed less crown blight disease than the standard PMR 45 variety or any other variety tested. Another commercial strain, PMR 6, has been consistently the variety most susceptible to crown blight. Since (1) the Arizona breeding stocks are less susceptible to crown blight than PMR 45 under a wide range of

conditions, and (2) the PMR 6 variety is always the most susceptible, indications are strong that the reaction to crown blight is controlled by the genetic makeup of the varieties. Plant breeding methods may, therefore, be used to increase resistance to a valuable level.

Breeding for cantaloup crown blight resistance has become a very important part of the vegetable breeding program conducted by the Horticulture Department of the University of Arizona. All of the breeding stocks in the program are being tested and compared for crown blight resistance. Hybrids are being made between resistant strains and between resistant stocks and the susceptible commercial varieties. Individual plant selection and other breeding techniques are being used to intensify resistance and to combine it with other desirable characteristics.

In addition to the breeding conducted on the University Experiment Station, Mesa (to be increased with the new facilities at the Yuma Station), work is being done in the greenhouse to determine the nature of crown blight resistance and to obtain some information regarding the cause of the disease.

*By J. K. Stewart