

tene (L/C) is a good index of color in the tomato fruit; and, in this instance, it indicates an advantage for the crimson character at all maturities over the high-pigment or standard-red types (Fig. 3). The crimson fruits had higher L/C ratios in all maturity classes and showed color development at 26 days maturity and 25 days ripening equal to the Homestead variety at 42 days maturity and 10 days ripening. These results indicate that with only once-over

harvesting, a greater proportion of the immature crimson fruits would be marketable and expected to develop acceptable color upon ripening than the high-pigment or standard-red types. The high-pigment genotype offered no apparent advantage, either with or without the crimson character.

Marketing of fruits with less than 26 days of vine maturity would probably be prohibited by lack of size and aspects of quality other than color.

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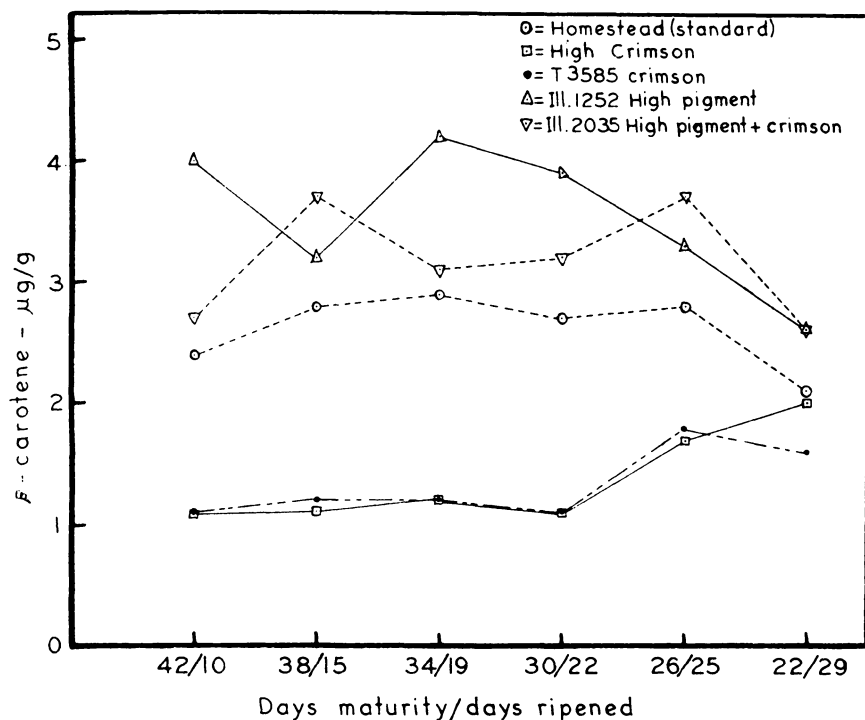


Fig. 2. The β -carotene content in the fruits of crimson, high-pigment, and standard-red tomatoes with different maturity and ripening periods.

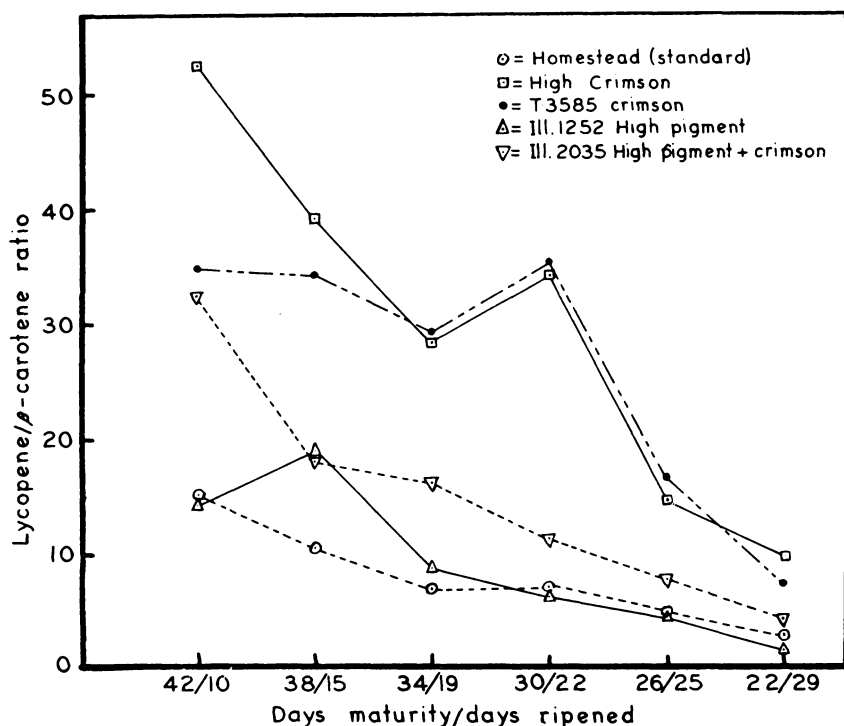


Fig. 3. Changes in the lycopene to β -carotene ratio in crimson, high-pigment, and standard-red tomatoes with different maturity and ripening periods.

Cantaloup Breeding Line B66-5:

Highly Resistant
to Watermelon
Mosaic Virus 1

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Major programs of crop improvement through breeding include the development of germ plasm resistant to diseases. Cantaloup improvement is no exception and control of diseases through resistance has been highly successful in this crop during the last half century (5). However, minor diseases, and new ones, frequently become major menaces to production through radical changes in environment and in crop management practices, and also through the introduction of crops that harbor the pathogens or vectors.

The destructive disease "crown blight" of cantaloup is thought to be caused in part by certain viruses (2). Consequently, a search for resistance to specific major cucurbit viruses among breeding lines and foreign cantaloup introductions was begun in 1961. Resistance to watermelon mosaic virus 1 (WMV-1) was found in the wild type *Cucumis melo* L. PI 180280 from India (3). Then a program was initiated to incorporate this resistance into germ-plasm resistant to other major diseases of the cantaloup.

PI 180280 and many breeding lines were obtained from G. W. Bohn, U. S. Horticultural Field Station, La Jolla, California for inoculation with specific viruses Freitag's isolate of watermelon mosaic virus (WMV) (1), obtained from G. R. Grogan, University of Cali-

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fornia, Davis, was used in the initial and most subsequent inoculations. This isolate was later identified as the type isolate of WMV-1 (4).

Mechanical virus inoculations were done with inoculum from infected cantaloup leaves ground with mortar and pestle, and applied with sterilized cheesecloth pads onto cotyledons and leaves previously dusted lightly with carborundum. *Myzus persicae* Sulz. maintained on pepper were used in all WMV-1 inoculations by aphids. Aphids were allowed to feed on small pieces of WMV-1-infected cantaloup leaves for about 1 hour at 55°F; then leaf tissue infested with 5-10 aphids was placed on each young cantaloup seedling held at 75-80°F. Plants were fumigated after 24 hours with 40% nicotine.

Screening for resistance to powdery mildew was done in the greenhouse by brushing spores from diseased squash 2-3 times at daily intervals onto seedlings in the cotyledon stage. Plants were screened for downy mildew infection in the field during the fall, the time when epidemics occur regularly.

Plants of PI 180280 were vigorous but highly susceptible to powdery mildew and Verticillium wilt. Fruit set was prolific, about 75 days to maturity, moderate to large in size, oblong, free of net, heavily sutured, light green immature color, pale yellow at maturity, flesh light orange, very soft and mealy with moderate odor when ripe.

When inoculated with WMV-1, either by mechanical means or by aphids, plants of PI 180280 developed a mottle, or local lesions, or local lesions with stem and top necrosis, or no symptoms. Numerous isolates of WMV-1 from Florida, Texas, and California induced similar reactions in open-pollinated populations of PI 180280. Plants that were symptomless and assayed as virus free were used in the initial cross that resulted in the development of cantaloup line B66-5.

Cantaloup breeding line B66-5 is a fourth generation inbred from the cross PI 180280 (India) x Seminole, backcrossed twice to Seminole, and then outcrossed to Edisto 47. It derives its resistance to WMV-1 from PI 180280. B66-5 is also resistant to both downy and powdery mildews inherent in Seminole and Edisto 47, and *Alternaria* leaf spot. Vines are vigorous and quite resistant to drought. Fruit set is concentrated, of medium to medium-large size. It is moderately well netted, nearly oval in shape, with a moderately recessed stem scar (Fig.1). The salmon flesh is thick, firm, and well flavored; the cavity is small and dry (Fig.2). Soluble solids of fruit at full slip grown at Belts-



Fig. 1. Fruit production by one plant of cantaloup line B66-5.

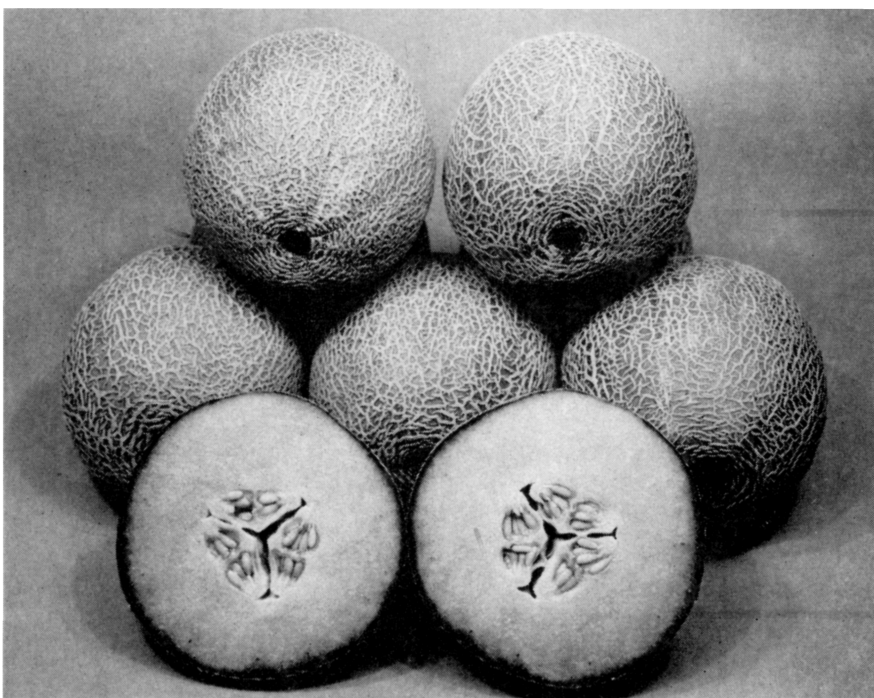


Fig. 2. Fruit of cantaloup line B66-5.

ville, Maryland, range from 12.0 to 13.5.

B66-5 is not resistant to Fusarium and Verticillium wilts. Its reaction to alternaria leaf spot has not been determined.

Breeding line B66-5 is not a finished variety. It is expected to segregate for such horticultural characters as earliness, concentrated fruit set, fruit size, shape, netting, quality, and maturity, including relative length of the harvest period. It is homozygous for resistance to WMV-1 and to downy and powdery mildews. This breeding line is released

to public and private cantaloup breeders. It should be useful to those having a WMV-1 problem in their production area.

Literature Cited

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