

PMR Honeydew Muskmelon

James D. McCreight

U.S. Agricultural Research Station, Agricultural Research Service, U.S.
Department of Agriculture, 1636 E. Alisal St., Salinas, CA 93905

G. Weston Bohn¹ and Thomas W. Whitaker²

Irrigated Desert Research Station, Agricultural Research Service, U.S.
Department of Agriculture, 4151 Highway 86, Brawley, CA 92227

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Greenflesh Honeydew (GFHD) muskmelon (*Cucumis melo* L.) is an erratic performer in the varied environments of Arizona, California (Imperial Valley and San Joaquin Valley), and Texas. The vines are susceptible to powdery mildew caused by *Sphaerotheca fuliginea* (Schlecht. ex. Fr.) Poll. and the cucurbit mosaic viruses including papaya ringspot virus (watermelon mosaic virus, see ref. 3), watermelon mosaic virus 2, and zucchini yellow mosaic virus. Common quality defects of the fruit include traces of net, non-uniform shapes and sizes, low soluble solids, thin flesh, the cavity becoming watery prior to best edibility, and poor flavor. This report describes PMR Honeydew, a recently released powdery mildew resistant honeydew breeding line.

Origin

PMR Honeydew originated from a cross of orange flesh muskmelon progeny 33186 and GFHD (Fig. 1). The F₁ was backcrossed to GFHD twice in succession; inbred six generations (including one open-pollinated generation) to produce the F₇ from the 2nd backcross. Selection for powdery mildew resistance was done at the seedling stage in the F₁BC₂, F₃BC₂, F₆BC₂, and F₇BC₂ generations in the greenhouse at La Jolla, Calif. The F₇BC₂ was backcrossed to GFHD twice in succession; inbred five generations (including one mass-selected generation) to produce the F₆ from the 4th backcross. Selection for powdery mildew resistance was done at the seedling stage in the F₁BC₄, F₂BC₄, F₄BC₄, F₅BC₄, and F₆BC₄ generations in the greenhouse at La Jolla. Progeny

61090 from the F₆BC₄ generation was selected for fruit quality and vine growth in the field at Brawley. Seed from sib- and self-pollinated fruit of progeny 61090 were bulked to produce F₇BC₄ generation sib-pollinated and self-pollinated progenies. Two F₇BC₄ progenies were self-pollinated to produce two F₈BC₄ generation progenies. PMR Honeydew is an open-pollinated increase from a mixed planting of two F₈BC₄ generation progenies.

Progeny 33186 was a powdery mildew race 2 resistant selection from a series of crossing and inbreeding using 'PMR 45', Resistant Cantaloupe (RC), and PI 124111. Resistant Cantaloupe, an inbred from a series of crossing and inbreeding using 'Hale's Best', PI 79376, and 'Persian', was the first line found by Jagger to be resistant to powdery mildew race 2 (see references in ref. 1). Resistant Cantaloupe was a good quality, orange flesh muskmelon, but it produced small fruit with thin net.

PMR Honeydew could have inherited powdery mildew resistant gene *Pm-1* from 'PMR 45'. It could also have inherited *PM-2* from PI 79376 (through RC), and, possibly, other genes for resistance to race 2 from PI 79376 and PI 124111. Pryor and Whitaker reported (2, 4), without supporting data, that potent resistance to powdery mildew race 2 was controlled by two or three partly dominant genes from PI 79376 and PI 124111. Bohn and Whitaker (1) demonstrated that potent resistance to powdery mildew race 2 in progeny 36486 was dependent on three partly dominant genes with full potency dependent on homozygosity of all three genes. Those findings are of interest here because 33186, the resistant parent of PMR Honeydew, was closely related to 36486 (= P3 in the genetic study).

Powdery mildew resistance

PMR Honeydew is highly resistant to powdery mildew. In replicated greenhouse tests, it had a mildew rating of 7 on a 1 to 9 scale (1 = completely susceptible; 9 = immune). Comparable ratings were: GFHD = 3; 'PMR 45' = 3; and 'PMR 6' = 5. In 1985, in replicated greenhouse tests, PMR

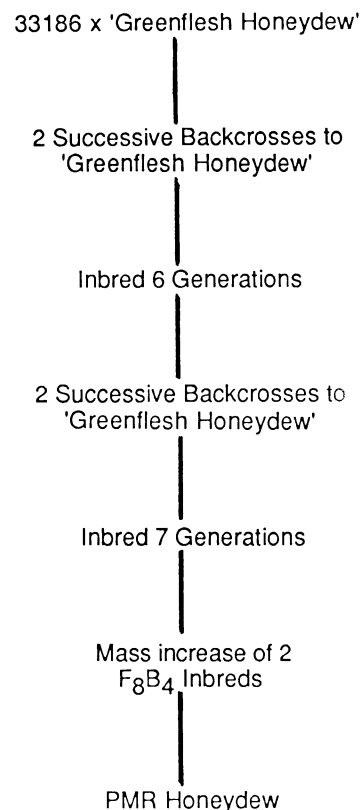


Fig. 1. Pedigree of muskmelon breeding line PMR Honeydew.

Honeydew was resistant to race 1 at Salinas, Calif. and to race 2 at Riverside, Calif.

Description

PMR Honeydew performed well in trials in California and Texas during two seasons, in plantings for both spring and fall harvest. Fruit sizes and shapes are good and uniform, although the fruit are slightly smaller than GFHD. The skin is smooth, turning creamy-white with yellow blotches when mature. The flesh is thick, greenish, and of excellent quality. Soluble solids of PMR Honeydew and GFHD are comparable. PMR Honeydew averaged about 16.5% soluble solids in one fall crop in Imperial Valley.

Availability

Small quantities of breeder's seeds are available from J.D.M. by written request.

Literature Cited

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¹Collaborator. Present address: 1094 Klish Way, Del Mar, CA 92014.

²Collaborator. Present address: P.O. Box 150, La Jolla, CA 92038.