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The Missouri Queen Watermelon

A Wilt Resistant Variety for Southeastern Missouri

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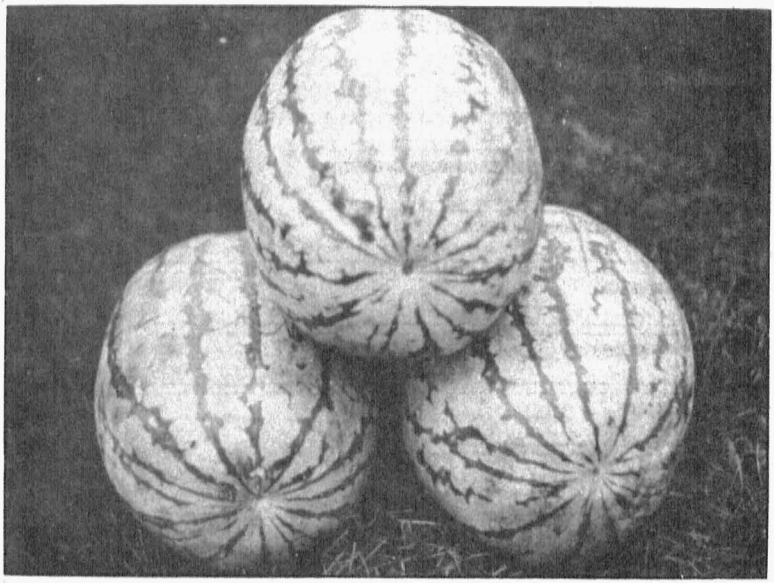

Typical melons of the Missouri Queen variety.

COLUMBIA, MISSOURI

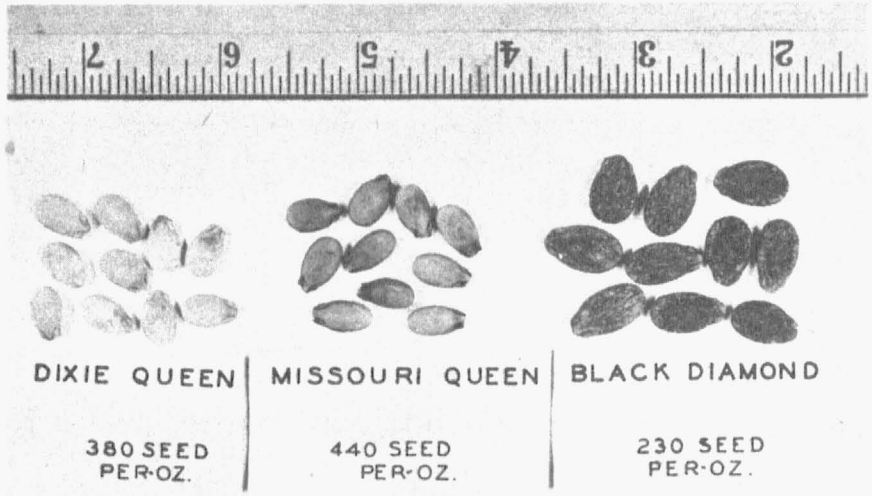

Fig. 2.—Seed of the Missouri Queen watermelon may be identified by their small size and brown tips.

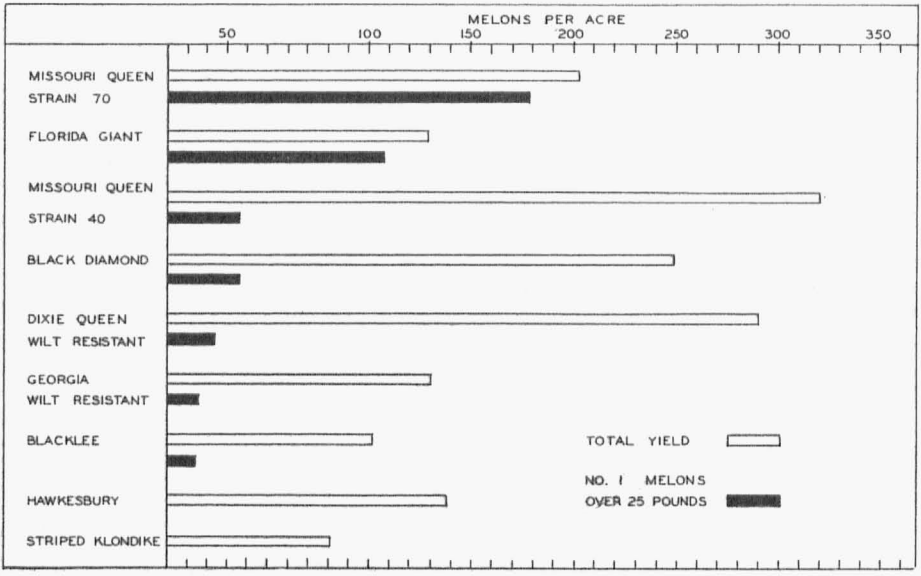

Fig. 3.—Comparative production of watermelon varieties at Gibson, Missouri, 1945 (in melons per acre).

The Missouri Queen Watermelon

A Wilt Resistant Variety for Southeastern Missouri

AUBREY D. HIBBARD*

Many acres of sandy soils in southeastern Missouri are adapted to the production of watermelons. Much of this land has become infested with Fusarium wilt, and is now unfit for growing this crop.

Desirable commercial varieties which are susceptible to this disease die before a crop can be produced. The disease eventually appears in all areas where melons are grown, and once in the soil it becomes a permanent menace.

Control has been secured in some regions by the development of disease resistant varieties. The Kleckley No. 6 in Iowa, the Klondike R7 in California and the Leesburg in Florida are such varieties which made possible the commercial production of watermelons on wilt infected areas. Unfortunately none of these varieties is adapted for commercial production under Missouri conditions.

Work was started in 1937 on the development of a resistant watermelon for southeastern Missouri. An acceptable commercial melon for this area develops to large size, matures in early midseason and will stand shipment for long distances. In addition, melons of a short cylindrical shape are preferred to long or round types. A desirable melon has a bright red flesh, a large solid heart free from fibers, inconspicuous seeds and a thin rind. Eating quality is determined by flavor, sugar content and crispness of flesh.

In 1937 the Dixie Queen variety most nearly answered this description and was widely grown. The seed stocks of this variety deteriorated until the cutting quality became very undependable because of white hearts. Black Diamond, a wilt susceptible variety, is now preferred by the trade.

The objective of this project when the work started was to produce a melon possessing the desirable qualities of the Dixie Queen combined with commercial resistance to the wilt disease. Two methods were followed in developing such a melon and both have met with success.

The first was to hybridize the Dixie Queen with varieties known to be wilt resistant. Crosses were made with Hawkesburg, Klondike

*With the valuable assistance of C. R. Cunningham, W. F. Toben and R. L. Christian, who were successively in charge of technical field operations.

R7, Kleckley No. 6 and Leesburg. All of these progenies were discarded except for two Leesburg crosses which are now in the eighth selfed generation. The Missouri Queen families numbers 20 and 30 are from this breeding. No releases of these strains are contemplated, but they are being retained as possible breeding material.

TABLE 1-COMPARATIVE YIELDS OF MISSOURI QUEEN AND OTHER WATERMELON VARIETIES AT GIBSON, MISSOURI, 1945

Variety	Hills	Total Crop			No. 1 Melons Over 25 lbs.			
		Melons	Av. Wt.	Melons Per Acre	Melons	Av. Wt.	Part of Crop	Melons Per Acre
	No.	No.	lbs.	No.	No.	lbs.	%	No.
Klondike, Striped (Wilt Resistant)	90	17	18	82	--	--	--	--
Georgia Wilt Resistant	50	15	17	130	2	28	12	16
Blacklee	90	21	19	101	3	28	14	14
Hawkesbury	22	7	19	138	--	--	--	--
Dixie Queen (Wilt Resistant)	75	50	16	290	4	26	8	23
Black Diamond	75	43	16	249	6	27	14	35
Florida Giant	65	25	26	167	16	29	64	106
Missouri Queen Strain 40	335	247	19	319	26	28	11	35
Missouri Queen Strain 70	147	60	28	202	41	31	68	137

The other method employed was the selection of resistant plants from commercial stocks of Dixie Queen. Several selections were made from plants surviving in heavily infested fields. These were selfed and the first generation plants grown on wilt infested land. None of the selections made from Missouri fields carried factors for resistance.

In 1939 a sample of Dixie Queen was secured from Mr. William Moore of Washington, Indiana. He was of the opinion that this strain possessed some resistance to wilt. Field counts showed only 5% survival by July 7. A susceptible strain in the same field had 3% of the plants alive on the same date while resistant varieties gave a 95% stand. There was one plant in the Moore strain with exceptional vigor that bore two melons, one of which was from a self pollinated fruit. This parent material was apparently a natural hybrid since subsequent generations segregated into almost every known water-

melon characteristic except dark skin color and brown seed coats. These lines have been inbred for seven generations in order to fix the desired characteristics.

Constant selection has been made to secure freedom from white hearts, good internal color, symmetrical shape, a tough rind and small white seeds with brown tips.

As a result of the watermelon breeding work and the extensive testing made a wilt resistant Dixie Queen type of melon superior to the parent from every viewpoint has been developed. The new melon has been named the Missouri Queen.

The first seed released for commercial trial of this melon was from line 70 plants open pollinated to all of the other Queen type resistant strains in the breeding plot. This seed was distributed for

TABLE 2-PRODUCTION OF SELECTED LINES AND STRAINS OF MISSOURI QUEEN WATERMELON AT GIBSON, MISSOURI, 1944 to 1946

			Total Crop			No. 1 Melons Over 25 lbs.			
Strains	Year	Hills	Melons Harvested	Average Weight	Melons Per Acre	Melons	Average Weight	Part of Crop	Yield Per Acre
		No	No.	lbs.	No.	No.	lbs.	%	No.
Line 70	1944	26	28	22	468	8	31	31	145
70-3	1945	19	8	28	228	6	31	32	74
70-1-2	1946	38	41	23	467	16	28	39	182
	3 yr. Av.			24	354		30	34	134
Line 76	1944	21	10	23	207	5	29	50	104
76-3	1945	19	12	31	275	10	33	83	228
76-1-1	1946	19	25	20	573	7	27	28	160
	3 yr. Av.			24	352		30	53	164
Line 79	1944	25	19	24	331	8	31	42	139
79-5	1945	19	19	27	453	11	31	57	258
79-5-1	1946	19	24	20	550	7	26	29	160
	3 yr. Av.			24	445		29	43	186
Strain 40	1944	63	29	20	200	5	28	17	34
Available 1947	1945	335	247	19	321	26	27	11	35
	2 yr. Av.			19	260		27	14	35
Strain 70	1944	179	162	24	394	54	31	33	130
Available 1948	1945	147	60	28	177	41	31	68	120
	1946	475	487	20	446	100	27	21	94
	3 yr. Av.			24	339		30	41	115

cooperative grower trials and limited seed increase. Two hundred-fifty acres were grown for market in southeastern Missouri during 1946. The information on adaptation and market acceptance was secured from growers using this seed.

The seed available for 1947 is from the No. 40 strain which was

bulked on an isolated seed increase plot and released to commercial seed producers in 1946. The inherent productivity and size of three typical selections from the 70 strain are shown in Table 2. Line numbers refer to the pedigree of plants from which the data were secured. The results reported are for three seasons, the last two of which were very unfavorable for the production of watermelon. The seed to be made available in 1948 will come from this strain. The foundation stock seed is from a selection with selfed parentage for seven generations. It was grown on an isolated seed increase plot in 1946, and is being released to commercial seed producers in 1947. It is the plan of this station to continue to supply foundation stock seed from the best lines available.

Description

The Missouri Queen most nearly resembles the Dixie Queen in commercial quality. The vines are vigorous and highly resistant to fusarium wilt. The foliage shows some resistance to leaf diseases. The resistance to wilt is sufficient to permit good production on land where susceptible varieties are a complete failure. The leaves are bright green and more finely cut than most varieties except Klondike. The plants set fruit readily, and production is usually high. (See Table 1.)

The marketable melons will average about 30 pounds. The shape is short cylindrical. A typical 30 pound melon will be about 10½ inches in diameter and 13 inches long. To the casual observer the color is identical to the Dixie Queen. Upon closer examination it will be found that the background approaches a true green with less blue cast than found in the older variety. Also the stripes are narrower and more regular. The skin is smooth whereas most strains of Dixie Queen are dimpled or slightly roughened. The rind is relatively thin, ½ to ¾ inches in thickness, but tough enough for good shipping and handling.

The flesh is a bright rosy red, fine grained and free from fibers. The flavor is rated good to excellent by most people. The sugar content is high for this type of melon. The soluble solid content will average about 11% as determined by a Brix hydrometer. The heart is large and free from second growth or fibers. The season is medium early, ripening with Hawkesburg or Kleckly Sweet or a few days before Dixie Queen and Black Diamond.

The seeds are inconspicuous being very small and colored white with tan tips. Because of their small size only one-half pound of seed is needed to plant an acre. One ounce contains about 440 seeds. See Fig. 2.

Fig. 4.—Field of Missouri Queen watermelons on wilt infested land in southeastern Missouri.

Adaptation

The Missouri Queen has not been tested extensively enough outside southeastern Missouri to determine the regions to which it is adapted. Trials so far indicate that it is, in common with other commercial varieties, best suited to localities similar to the place of origin. Outside of southeastern Missouri, it has made a good showing in central Missouri, Indiana, Ohio, Alabama and Delaware. We have had a few unfavorable reports but these could be traced to adverse growing conditions. It is recommended that this variety be planted

only on very light sandy soils that are known to be well suited for melons. The fertilizer used should contain quickly available nitrogen in an inorganic form and be applied at planting time or before. Early planting is desirable. When delayed, the extremely vigorous vines tend to over set and the resulting melons are small in size. The yield of marketable melons can be increased by pruning off all but two melons on each vine.

Market Acceptance

Experience during the season of 1946 indicates that the growers of Missouri Queen would experience no difficulty in shipping or handling this melon. Most buyers are of the opinion that the variety will be accepted by the trade after it becomes known. At present there is considerable reluctance among buyers to take striped melons because of the unfavorable experience they have had with white hearts in certain strains of Dixie Queen. Dealers who handled Missouri Queens in 1946 reported favorably in their cutting and carrying quality. Growers selling directly to truckers had repeat orders. Some producers reported that they were forced to accept a 25% discount by buyers who were unfamiliar with the variety. Because of the market preference for dark green melons, the Missouri Queen is recommended only to those growers whose land is wilt infested or who have a good outlet for striped melons, of the Dixie Queen type.

Further Projects

The watermelon breeding work is being continued. The best strains of Missouri Queen can be further developed. Melons with greater uniformity, higher sugar content, larger hearts and better flesh color are possible. Some progress has been made in breeding a dark green melon with the desirable characteristics of the Missouri Queen. Before the war there was considerable interest in watermelons small enough to cool in the family refrigerator. A small, high quality watermelon resistant to disease is another objective of this breeding work.