

51
2226
278

AUrora:

A high quality "Jumbo" cantaloupe



CIRCULAR 278
MAY 1985



ALABAMA AGRICULTURAL EXPERIMENT STATION AUBURN UNIVERSITY
GALE A. BUCHANAN, DIRECTOR AUBURN UNIVERSITY, ALABAMA

CONTENTS

	<i>Page</i>
ORIGIN	3
DISEASE RESISTANCE	5
AVAILABILITY OF SEED	6
LITERATURE CITED	7
ACKNOWLEDGMENTS	8
APPENDIX	9

FIRST PRINTING 4M, MAY 1985

Information contained herein is available to all without regard to race, color, sex, or national origin.

AUrora: A High Quality “Jumbo” Cantaloupe

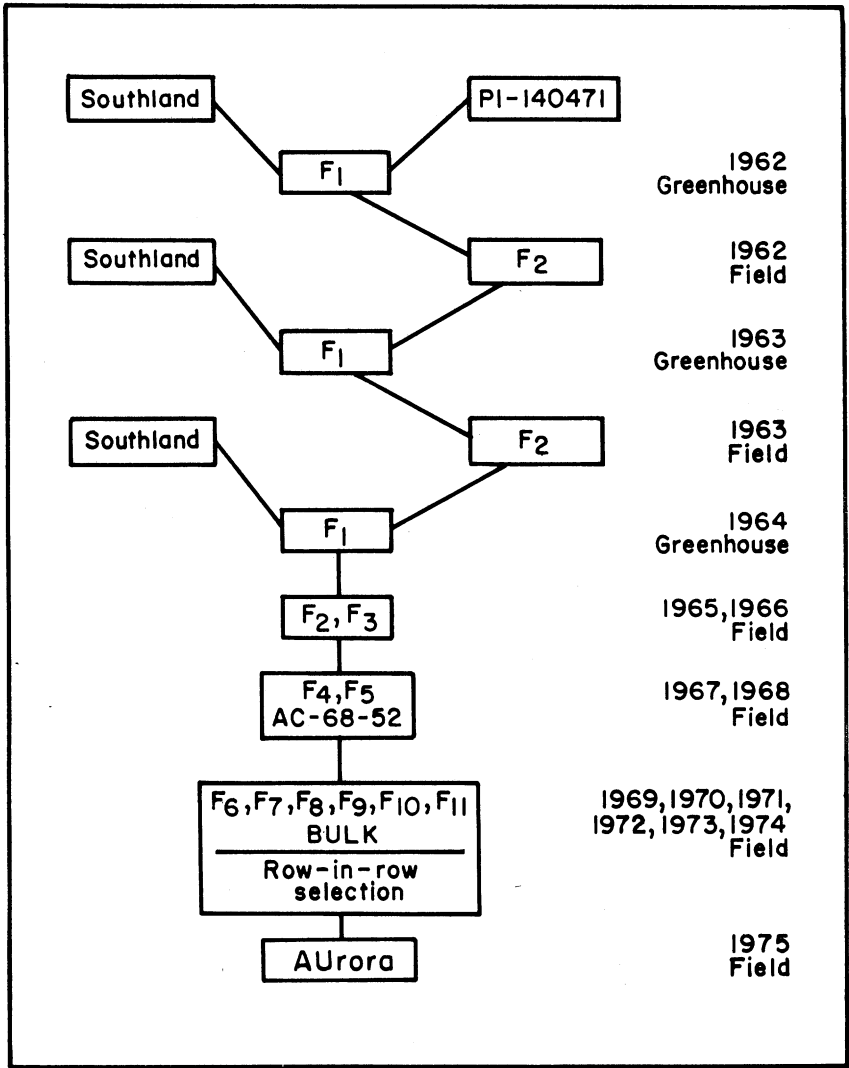
J. D. Norton, R. D. Cospers, D. A. Smith and K. S. Rymal¹

Prevalence of foliar diseases, particularly downy mildew, powdery mildew, and gummy stem blight, and susceptibility of existing varieties to these diseases discourage the growing of cantaloupes in the Southeastern United States. In 1970, 1971, and 1972 the introduction of the high quality, disease resistant varieties Southland (4), Gulfcoast (3), and Chilton (2) by the Alabama Agricultural Experiment Station demonstrated that high quality fruit could be produced in humid climates. The newest release from this breeding program is AUrora a multiple disease resistant cantaloupe variety adapted to growing conditions in the Southeastern United States. It has resistance to *Pseudoperonospora cubensis* (downy mildew), *Spherotheca fuliginea* (powdery mildew), and *Didymella bryoniae* (gummy stem blight). Due to the large size of the fruit, AUrora is especially suited for home, local, and commercial markets where a “jumbo” type fruit is preferred.

ORIGIN

AUrora is an inbred line from the cross Southland x PI 140471, figure. Following the cross, a backcrossing and disease screening program was followed with selection of disease resistant seedlings that produced high quality fruit. Thus, AUrora originated from a program of backcrossing and inbreeding

¹ Respectively, Professor, Research Associate, Professor, and Associate Professor of Horticulture.



Pedigree of AUrora jumbo Cantaloupes.

to obtain resistance to downy mildew, gummy stem blight, and powdery mildew. It has been grown in trials as AC-68-52 at the Main Station (Auburn), the E. V. Smith Research Center (Shorter), and a number of substations of the Alabama Agricultural Experiment Station and in the Southern Cooperative Cantaloupe Variety Trials in other Southern States.

DISEASE RESISTANCE

AUrora has been rated for resistance to downy mildew, gummy stem blight, and powdery mildew, in tests at several locations in Alabama and in other Southern States. Disease index ratings for greenhouse screening tests using the Sowell method (6) are given in table 1. Resistance to gummy stem blight was incorporated into the breeding line through a screening program which utilized an incubation chamber and greenhouse to eliminate susceptible plants from the populations (5,6). Multiple disease resistance of AUrora plants has been excellent in field plantings. Resistance to gummy stem blight and a tolerance to pickleworm and rootknot nematode were secured from PI 140471 (5,6). Resistance to downy mildew and powdery mildew was obtained from Georgia 47 and Florisun through Southland (1,2).

Although AUrora is multiple disease resistant it is not immune to the major disease of cantaloupes. Therefore, stringent control measures, such as crop rotation, seed treatment, and foliar sprays, may be required.

The fruit of AUrora are round to oblong in shape. They measure 6 to 7 inches in diameter, with an average weight of 4.19 pounds, table 2. Fruit size will vary at different fertility levels and in different production areas. "Jumbo" size fruit equal to size 9 melons based on the commercial pack may be secured with adequate fertility and irrigation. AUrora fruit are comparable in size to other "Jumbo" melons commonly grown and hauled loose without the use of boxes or crates. Therefore, it should sell well on the open market in competition with other large size melons.

TABLE 1. DISEASE INDEX RATING FOR DOWNY MILDEW, POWDERY MILDEW, AND GUMMY STEM BLIGHT, MAIN STATION, AUBURN

Variety	Disease index ¹			Average
	Downy mildew	Gummy stem blight ²	Powdery mildew	
AUrora	1.0	2.0	1.0	1.4
Chilton	1.0	1.5	1.0	1.2
Edisto 47	1.5	5.0	1.5	2.7
Gulfcoast	1.0	1.5	1.0	1.2
Mainstream	1.5	4.0	1.5	2.3
Planters Jumbo	1.5	4.0	1.5	2.3
Hales Best Jumbo	3.5	5.0	3.5	4.0

¹ Disease index: 0 = no injury, up to 5 = all plants severely damaged.

² Greenhouse screening tests.

TABLE 2. AVERAGE YIELD, FRUIT WEIGHT, SOLUBLE SOLIDS, ASCORBIC ACID, TASTE TEST, AND RIND FIRMNESS OF CANTALOUPE VARIETIES, E. V. SMITH RESEARCH CENTER, SHORTER, 1977-83

Variety	Yield per acre	Fruit weight	Soluble solids ¹	Ascorbic acid ²	Taste test ³	Rind firmness ⁴
	<i>Lb</i>	<i>Lb.</i>	<i>Pct.</i>	<i>mg / 100 gm</i>		<i>Lb. / sq. in.</i>
AUrora	34,246	4.19	11.90	65.0	7.97	47.47
Chilton	28,570	2.96	12.91	61.3	8.23	72.16
Edisto 47	23,561	4.37	11.85	80.0	7.41	40.08
Gulfcoast	29,387	3.09	12.14	52.5	8.07	68.41
Mainstream	23,152	3.18	10.56	50.0	8.00	52.87
Planters Jumbo	19,665	3.62	10.63	56.0	7.67	40.86

¹ Total soluble solids determined with a Baush and Lomb refractometer, 0 to 25 percent scale.

² Ascorbic acid content in milligrams per 100 grams of fruit.

³ Taste test ratings are the average scores on fresh chilled fruit: 9 or 10 = highly acceptable, 7 or 8 = acceptable, 5 or 6 = barely acceptable, and below 5 = unacceptable.

⁴ Puncture test performed with Instron 1122 Instrument expressed in pounds per square inch of pressure required to penetrate fruit with 1 cm² or 0.16-inch Magnus Taylor Probe.

The fruit are slightly ribbed and well covered with a medium net. They mature 70-75 days from planting. The seed cavity is small. The flesh is thick, deep orange (24A)², and of excellent flavor and aroma. Taste tests indicated that the edible quality (color, texture, taste) was higher for AUrora than for Planters Jumbo and Edisto 47. Ascorbic acid content was also higher than that of Planters Jumbo and Mainstream, table 2.

The fruit is firm and adapted to harvesting and handling. The flesh is firm at the full slip stage; however, it will soften to an excellent condition for dessert quality 3 to 4 days after full slip.

AUrora compares favorably with established jumbo type varieties in yielding ability, shipping quality, and edible quality, as indicated by taste and soluble solids, table 2.

AVAILABILITY OF SEED

An exclusive release of AUrora was made to Asgrow Seed Company, Inc., Kalamazoo, Michigan, for production and marketing of seed. Growers and home gardeners should find high quality seed available from local wholesale and retail outlets for vegetable seed for the 1985 spring planting season.

²RHS Colour Chart, The Royal Horticulture Society, London, England.

LITERATURE CITED

- (1) JAMISON, F. S., J. M. MONTELARO, and J. D. NORTON. 1962. Florida No. 1 and Florisun. Two New Cantaloupe Varieties for Florida Growers. Univ. of Fla. Agr. Exp. Sta. Cir. S-139-A.
- (2) NORTON, J. D. 1970. Southland - A Large Cantaloupe for the South. Ala. Agr. Exp. Sta. Leaf. 79.
- (3) _____ . 1971. Gulfcoast - A Sweet Cantaloupe for the Produce Chain Store Market. Ala. Agr. Exp. Sta. Leaf. 82.
- (4) _____ . 1972. Chilton - A High Quality Fruit for the Commercial Market. Ala. Agr. Exp. Sta. Leaf. 84.
- (5) PRASAD, KRISHNA and J. D. NORTON. 1967. Inheritance of Resistance to *Mycosphaerella citrullina* in Muskmelon. J. Amer. Soc. Hort. Sci. 91:396-400.
- (6) SOWELL, GROVER B., Jr., KRISHNA PRASAD, and J. D. NORTON. 1960. Resistance of *Cucumis melo* Introductions to *Mycosphaerella citrullina*. Plant Dis. Rept. 50:661-663.

ACKNOWLEDGMENTS

The authors gratefully acknowledge the assistance of Grover B. Sowell, Jr., Research Pathologist, USDA Southeastern Regional Plant Introduction Station, Experiment, Georgia, for discovery of resistance to *Didymella bryoniae* and counseling in screening techniques with the disease organisms. Essential assistance was rendered by H. M. Bryce, Main Station, and J. A. Pitts, C. C. Carlton, and K. C. Short, Chilton Area Horticulture Substation, in increasing seed for grower trials and conducting variety trials.

Valuable assistance was rendered by M. H. Hollingsworth, North Alabama Horticulture Substation; E. L. Carden and F. B. Selman, Gulf Coast Substation; and J. G. Starling and H. W. Ivey, Wiregrass Substation, in conducting yield trials.

Assistance of growers in conducting production trials is deeply appreciated.

The assistance of participants in the Southern Cooperative Cantaloupe Variety Trials is acknowledged.

APPENDIX

TABLE 1. YIELD OF FRUIT OF CANTALOUPE CULTIVARS, E. V. SMITH RESEARCH CENTER, SHORTER, 1977-83

Cultivar	Yield/acre							
	1977	1978	1979	1980	1981	1982	1983	Average
	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.
Planters								
Jumbo	21,906	11,789	26,373	24,758	38,256	21,386	31,603	19,665
Edisto 47	—	15,852	32,911	31,988	21,171	18,324	21,122	23,561
Mainstream ..	23,978	20,712	—	—	25,628	21,042	24,400	23,152
AUrora	30,112	—	—	35,119	38,678	25,426	41,896	34,246
Chilton	33,587	26,538	20,938	23,673	32,446	23,826	30,060	28,570
Gulfcoast	30,219	23,606	24,995	36,239	37,166	22,464	31,020	29,387

TABLE 2. NUMBER OF FRUIT OF CANTALOUPE CULTIVARS, E. V. SMITH RESEARCH CENTER, SHORTER, 1977-84

Cultivar	Number of fruit/acre/year								
	1977	1978	1979	1980	1981	1982	1983	1984	Average
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Planters									
Jumbo	6,624	3,889	7,037	6,626	9,128	5,706	8,432	—	5,439
Edisto 47	—	3,595	7,464	7,255	5,054	4,156	4,790	—	5,452
Mainstream ..	10,876	4,697	—	—	8,942	6,363	7,905	—	8,537
AUrora	6,829	—	—	8,324	9,747	5,492	11,178	8,848	8,350
Chilton	11,719	9,280	7,305	7,158	11,321	8,313	10,488	7,826	9,591
Gulfcoast	8,791	8,236	7,558	10,273	11,229	7,838	11,725	9,636	9,661

TABLE 3. WEIGHT OF FRUIT OF CANTALOUPE CULTIVARS, E. V. SMITH RESEARCH CENTER, SHORTER, 1977-84

Cultivar	Fruit weight in pounds/year								Average
	1977	1978	1979	1980	1981	1982	1983	1984	
	Planters								
Jumbo	3.3	3.1	3.7	3.7	4.2	3.7	3.7	—	3.62
Edisto 47	—	4.4	4.4	4.4	4.2	4.4	4.4	—	4.37
Mainstream ..	2.2	4.4	—	—	2.9	3.3	3.1	—	3.18
AUrora	4.4	—	—	4.2	4.0	4.6	3.7	4.0	4.12
Chilton	2.9	2.9	2.9	3.3	2.9	2.9	2.9	2.7	2.87
Gulfcoast	3.1	2.9	3.3	3.5	3.3	2.9	2.6	2.6	3.00

TABLE 4. TOTAL SOLUBLE SOLIDS (TSS) OF CANTALOUPE CULTIVARS, E. V. SMITH RESEARCH CENTER, SHORTER, 1977-84

Cultivar	Percent TSS/year								Average
	1977	1978	1979	1980	1981	1982	1983	1984	
	Planters								
Jumbo	9.8	9.4	10.7	10.3	12.3	10.4	11.5	—	10.63
Edisto 47	—	11.4	11.4	11.5	13.3	11.3	12.2	—	11.85
Mainstream ..	9.0	9.6	—	—	12.2	10.4	11.6	—	10.56
AUrora	11.8	—	—	11.1	13.5	10.9	12.2	12.1	11.93
Chilton	12.8	13.4	11.4	12.5	14.8	11.9	13.6	13.3	12.99
Gulfcoast	12.1	12.8	11.0	11.4	13.9	10.9	12.9	12.7	12.22

TABLE 5. ASCORBIC ACID CONTENT IN MILLIGRAMS PER 100 GRAMS OF FRUIT OF CANTALOUPE CULTIVARS, E. V. SMITH RESEARCH CENTER, SHORTER, 1983

Cultivar	Ascorbic acid/100 g fruit, by replication				
	A	B	C	D	Average
	mg	mg	mg	mg	mg
Planters Jumbo	45	60	80	40	56.0
Edisto 47	80	80	80	80	80.0
Mainstream	50	55	50	45	50.0
AUrora	70	60	70	60	65.0
Chilton	70	60	65	50	61.3
Gulfcoast	55	55	50	50	52.5

TABLE 6. RESPONSE OF TASTE PANEL TO QUALITY ¹ OF CANTALOUPE CULTIVARS, MAIN STATION, AUBURN, 1983

Cultivar	Color	Texture	Flavor	Overall quality ²
Planters Jumbo	7.5	7.8	7.7	7.67
Edisto 47	7.3	7.5	7.5	7.41
Mainstream	7.8	8.0	8.1	8.00
AUrora	7.8	8.0	8.0	7.97
Chilton	8.1	8.2	8.4	8.23
Gulfcoast	7.9	8.1	8.2	8.07

¹ Mean scores and expert panel (3-4 panelists) were obtained on fresh chilled fruit. Numerical scores are as follows: 9 or 10 = highly acceptable, 7 or 8 = acceptable, 5 or 6 = barely acceptable, and below 5 = unacceptable.

² Overall ratings are the means of all the panelists' ratings.

TABLE 7. FLESH COLOR ¹ OF CANTALOUPE CULTIVARS, MAIN STATION, AUBURN, 1983

Cultivar	Flesh color		
	L	a	b
Planters Jumbo	57.42	13.14	24.82
Edisto 47	56.74	13.68	23.87
Mainstream	57.50	13.36	25.26
AUrora	58.62	13.64	26.06
Chilton	59.48	15.34	26.10
Gulfcoast	60.14	14.36	26.14

¹ Hunter color difference values standardized to red plaque L = 68.7, a = 23.0, and b = 9.4, where L = total light reflectance, a = red, and b = yellow.

TABLE 8. RIND FIRMNESS (PUNCTURE TEST) OF CANTALOUPE CULTIVARS, MAIN STATION, AUBURN, 1983¹

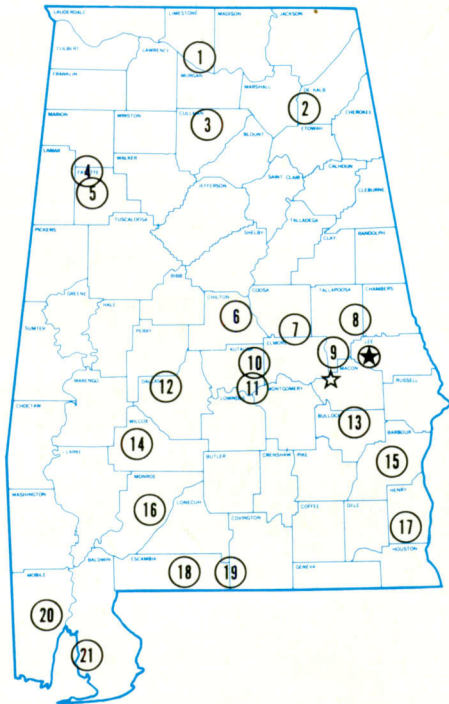
Cultivar	Puncture test results				
	Stem end	Blossom end	Top	Bottom	Average
	Lb./in.	Lb./in.	Lb./in.	Lb./in.	Lb./sq. in.
Planters Jumbo	39.7	39.7	43.2	39.7	40.86
Edisto 47	38.8	40.1	43.0	38.4	40.08
Mainstream	49.4	55.1	59.5	47.4	52.87
AUrora	47.6	44.7	50.3	47.2	47.47
Chilton	71.6	67.9	84.2	64.8	72.16
Gulfcoast	69.0	64.6	80.5	59.5	68.41

¹ Puncture test performed with Instron 1122 Instrument, 0.16-inch Magnus Taylor Probe.

Alabama's Agricultural Experiment Station System

AUBURN UNIVERSITY

With an agricultural research unit in every major soil area, Auburn University serves the needs of field crop, livestock, forestry, and horticultural producers in each region in Alabama. Every citizen of the State has a stake in this research program, since any advantage from new and more economical ways of producing and handling farm products directly benefits the consuming public.



Research Unit Identification

- ★ Main Agricultural Experiment Station, Auburn.
- ☆ E. V. Smith Research Center, Shorter.

1. Tennessee Valley Substation, Belle Mina.
2. Sand Mountain Substation, Crossville.
3. North Alabama Horticulture Substation, Cullman.
4. Upper Coastal Plain Substation, Winfield.
5. Forestry Unit, Fayette County.
6. Chilton Area Horticulture Substation, Clanton.
7. Forestry Unit, Coosa County.
8. Piedmont Substation, Camp Hill.
9. Plant Breeding Unit, Tallassee.
10. Forestry Unit, Autauga County.
11. Prattville Experiment Field, Prattville.
12. Black Belt Substation, Marion Junction.
13. The Turnipseed-Ikenberry Place, Union Springs.
14. Lower Coastal Plain Substation, Camden.
15. Forestry Unit, Barbour County.
16. Monroeville Experiment Field, Monroeville.
17. Wiregrass Substation, Headland.
18. Brewton Experiment Field, Brewton.
19. Solon Dixon Forestry Education Center,
Covington and Escambia counties.
20. Ornamental Horticulture Substation, Spring Hill.
21. Gulf Coast Substation, Fairhope.