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INFLUENCE OF PLANTING METHOD, FERTILIZER RATE, AND WITHIN ROW PLANT SPACING ON PRODUCTION OF TWO CULTIVARS OF HONEYDEW MELONS

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Abstract. **'Earli-Dew' and 'TAM-Dew Improved' melons** (Cucumis melo **L.) were direct seeded and transplanted at the same date on a fine sandy soil at Gainesville. Within row plant spacings were 1, 2, or 3 feet. Fertilizer rates were a basic application of 1500, 2000, or 2500 lbs/acre of a 6-8-8 fertilizer. Highest early yields were obtained from 'Earli-Dew' and from transplants. Total yields were highest from 'TAM-Dew Improved' and with direct seeding. Transplanting increased total fruit number but decreased mean fruit weight compared to direct seeding. This effect was more pronounced in 'TAM-Dew Improved' than in 'Earli-Dew'. Increasing plant spacing increased the number of fruit per plant and mean fruit size but decreased the total number and weight of fruit. Fertilizer rates had no effect on marketable yield of fruit but the percentage of cull fruit was decreased with the highest fertilizer rate. The results indicate potential of these varieties for production of high quality honeydew melons in Florida.**

Although muskmelons are not grown commercially on a large scale in Florida, their potential for increased production has received considerable attention. Previous investigations have addressed such topics as cultivar evaluation (7, 8, 9, 13, 20), variety development (8, 12, 20), general cultural practices (21), insect and disease control (1, 4), and postharvest handling (14). The limiting factor to increased production most often cited in these reports is poor fruit quality. Plant defoliation by fungus diseases in humid regions and high temperatures and rainfall during the fruit maturation period militate against the development of fruits with firm flesh and high sugar content. This has prompted efforts to adapt honeydew-type melons for production in Florida (5, 10, 15). Compared to common netted melons, or "cantaloupe" types, honeydew varieties consistently develop a higher sugar content. Limiting their production are such factors as late maturity, lack of disease resistance, and failure to "slip" or ripen on the vine, thus necessitating ethylene treatment to initiate ripening. Recent variety trial results (7, 8, 9) have indicated potential for the varieties 'Earli-Dew' and 'TAM-Dew Improved' due to their early maturity, disease tolerance, and ability to vine ripen. However, their fruit tend to be somewhat smaller than the standard 'Honey Dew' variety. Honeydews are packed and marketed according to count-size per carton (16) and a premium is paid for the larger fruit sizes. The influence of plant spacing and fertilization rate on fruit size has been reported for muskmelons (6, 22) and other fruiting crops (2, 3, 11). The purpose of this study was to further evaluate the potential of these varieties and determine the effects of planting method, spacing, and fertilizer rate on their production.

Materials and Methods

'Early-Dew' and 'TAM-Dew Improved' muskmelons were direct seeded and transplanted March 24, 1981 on a Kanapaha fine sandy soil at Gainesville. Transplants were seeded three weeks previously in 2¼-inch peat pots containing peat-lite mix. The soil was fumigated with 6 gals/acre of ethylene dibromide applied as a row treatment three weeks before planting. Raised beds were formed on 6-ft centers with a 24-inch width. Within row spacings were 1, 2, or 3 feet between plants. Fertilizer rates were a basic application of 1500, 2000, or 2500 lbs/acre of 6-8-8 (N, P_2O_5, K_2O plus fritted trace elements). One half of the basic application was broadcast preplant over the beds and incorporated 6-8 inches deep. The remainder was applied as a sidedressing in 3-inch furrows three weeks after planting. All plots received a supplemental application of 200 lbs/acre 15-0-14 as a sidedressing 10 days later. Treatment plots were single rows 20 feet long, and the 36 treatment combinations were replicated four times in a randomized complete block design. Cultivation, pesticide application, and overhead sprinkler irrigation were performed as needed to promote good crop growth. Two beehives were placed at the perimeter of the field to ensure adequate pollination. Plots were harvested three times a week from June 2 to July 7. 'Earli-Dew' melons were harvested at full slip. 'TAM-Dew Improved' melons did not slip from the vines at maturity and were therefore harvested at the hard slip stage. Soluble solids contents of two melons from each plot at each harvest were obtained by hand refractometer.

Results and Discussion

A relatively clear and dry climate predominated during most of the spring 1981 growing season (Table 1) resulting in average daily high temperatures somewhat above, and average daily low temperatures somewhat below normal. This environment was favorable for good crop development, and disease incidence was minimal until late in the season.

Table 1. Temperature and rainfall during spring, 1981 season, Gainesville.

Month	High Temperatures Average (°F)	High Temperatures Range (°F)	Low Temperatures Average (°F)	Low Temperatures Range (°F)	Rainfall (inches)
March (24-31)	77.1	64-86	50.5	35-62	0.0
April	87.9	70-90	53.0	37-67	0.1
May	89.4	74-100	57.2	42-72	0.5
June	101.3	94-110	67.6	55-76	7.2
July (1-7)	98.9	84-110	63.1	58-66	1.9

Higher early yields were obtained from 'Earli-Dew' (Table 2), but total marketable yields were greater for 'TAM-Dew Improved' (Table 3). A much higher percentage of cull fruit was obtained from 'Early-Dew'. Cull fruits were comparable in size to marketable fruit but exhibited radial and longitudinal cracking. The cause of this defect is not known, but its severity was increased by close plant spacings and low fertilizer rates. No consistent fertilizer rate effects were observed for any of the other yield components measured. Soluble solids contents of 'TAM-Dew Improved' fruit were higher than those of 'Earli-Dew' early in the season, but were lower and similar in both varieties in later harvests.

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Table 2. Main effects of variety, planting method, spacing and fertilizer rate on early yield of honeydew melons.

	Early yield[z]				
	Marketable yield (cwt/acre)	Culls (cwt/acre)	Fruit/ plant (no)	Weight/ fruit (lbs)	Soluble solids (%)
Variety					
Earli-Dew	89.3	106.3	1.57	3.14	13.4
TAM-Dew Imp.	30.6	13.6	.45	2.45	14.0
F value[y]	**	**	**	**	**
Planting method					
Seeded	51.4	53.9	.71	3.58	13.1
Transplanted	68.5	65.9	1.31	2.58	13.8
F value	*	*	**	**	**
Plant spacing (ft)					
1	73.5	80.8	.76	2.69	13.6
2	54.7	58.0	1.02	3.01	13.7
3	51.7	41.0	1.25	3.04	13.4
F value	*	**	**	**	ns
Fertilizer rate (lbs/acre)					
1500	61.9	66.4	1.02	2.96	13.5
2000	56.2	60.1	1.01	2.85	13.5
2500	61.6	53.3	1.00	2.93	13.7
F value	ns	ns	ns	ns	ns

[z]Harvest period June 2 to June 19.
[y]Treatment effects not significant (ns) or significant at the 5% (*) or 1% (**) level.

Table 3. Main effect of variety, planting method, spacing and fertilizer rate on total yield of honeydew melons.

	Total yield[z]				
	Marketable yield (cwt/acre)	Culls (cwt/acre)	Fruit/ plant (no)	Weight/ fruit (lbs)	Soluble solids (%)
Variety					
Earli-Dew	132.2	164.0	2.3	3.23	12.7
TAM-Dew Imp.	171.4	86.3	2.1	3.29	13.0
F value[y]	**	**	ns	ns	ns
Planting method					
Seeded	183.3	129.6	2.0	3.96	12.3
Transplanted	120.3	120.7	2.4	2.56	13.3
F value	**	ns	**	**	**
Plant spacing (ft)					
1	177.9	177.2	1.7	2.99	13.0
2	142.8	116.5	2.2	3.43	13.2
3	134.7	81.7	2.7	3.36	12.5
F value	**	**	**	**	*
Fertilizer rate (lbs/acre)					
1500	158.5	139.7	2.3	3.29	12.9
2000	147.5	130.0	2.2	3.27	12.6
2500	149.4	105.8	2.1	3.21	13.1
F value	ns	*	ns	ns	ns

[z]Harvest period June 2 to July 7.
[y]Treatment effects not significant (ns) or significant at the 5% (*) or 1% (**) level.

Transplanting gave rise to higher early yields but lower total yields compared to direct seeding (Tables 2 and 3). The number of fruit per plant was greater but mean fruit weight lower in the transplanted plots throughout the harvest period. Visual observations indicated that transplants had a larger vine size at the time of flowering and a more concentrated period of fruit set. Direct seeded plants were more compact at flower initiation, but the fruit setting period was more prolonged, and they eventually attained a larger leaf area. Similar patterns of fruit set and plant development in muskmelons in response to planting date have been reported (17, 18).

A differential response of the two cultivars to planting method was observed for several parameters (Table 4). Although the first fruit harvested were from 'Earli-Dew' transplants, overall early yields of 'Earli-Dew' were decreased by transplanting. However, the only early harvests of 'TAM-Dew Improved' were obtained from transplants, but these fruit were small in size. The effect of transplanting in increasing the number of fruit per plant was much greater in 'TAM-Dew Improved' than in 'Earli-Dew' as was the resulting decrease in mean fruit weight.

Increased plant spacing decreased the early and total marketable yield but increased the number of fruit per plant and mean fruit weight. These relationships are in agreement with previous reports on spacing of muskmelons (6, 22). However, in this study total mean fruit weight and soluble solids content were highest at the intermediate spacing.

The results of the study indicate the potential for production of high quality honeydew fruits in Florida. Total marketable yields reported here are similar to those attained in the southwestern United States production areas (19). Honeydews are in relatively short supply during May and June in eastern markets, and prices are high for quality fruit. In this trial fruits were of excellent eating quality but relatively small in size. By direct seeding at wide spacing, however, fruits of acceptable market size were

Table 4. Interaction of variety and planting method on early and total yield of honeydew melons.

Variety	Planting method	Early[z]	Total[y]				
		Marketable yield (cwt/acre)	Marketable yield (cwt/acre)	Culls (cwt/acre)	Fruit/ plant (no)	Weight/ fruit (lbs)	Soluble solids (%)
Earli-Dew	Seeded	102.7	168.6	180.5	2.30	3.73	12.2
	Transplanted	75.9	95.7	147.5	2.32	2.73	13.2
TAM-Dew	Seeded	0.0	197.0	78.7	1.64	4.19	12.6
	Transplanted	61.2	144.9	93.9	2.54	2.39	13.5
Interaction[x]		**	ns	*	**	**	ns

[z]Harvest period June 2 to June 19.
[y]Harvest period June 2 to July 7.
[x]Interaction not significant (ns) or significant at the 5% (*) or 1% (**) level.

obtained. High fertilizer rates did not increase marketable yield but did reduce the proportion of culls. There was no apparent advantage to transplanting unless early prices were at a premium and 'TAM-Dew Improved' was utilized. However, in light of the reduction in total marketable yield and weight per fruit by transplanting, it would be preferable to achieve earliness by direct seeding 'Earli-Dew'. Growers should consider devoting part of their acreage to each variety since this would achieve a desirable combination of both high early and total marketable yields.

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YIELD AND QUALITY RESPONSE OF CRISPHEAD LETTUCE CULTIVARS TO SEEDING DATES AND FARMS IN SOUTH FLORIDA ORGANIC SOILS

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Abstract. **Twelve cultivars and breeding lines were seeded in early, mid, and late winter on 2 farms. The growing seasons were designed to be winter, early spring, and spring in consideration of the sub-tropical south Florida weather. Farm 1 had a history of very low incidence and farm 2 of very high incidence of corky root rot. Yields were significantly affected by seasons, farms, varieties, and their interaction. Farm 1 was significantly more productive than farm 2, but this was dependent on seasons. In early spring head weight was high for all entries regardless of farms, whereas in winter and spring, head weight was lower particularly on farm 2. Corky root rot tolerant entries were significantly more productive than susceptible entries on farm 2. All entries tended to produce less head weight under cloudy cold winter or hot spring conditions. Florida 1265 and 1366 were equal or better in yield and quality than 'Ithaca' and 'Shawnee'. Florida 44063, 49019, 49017, and 49018 showed the same degree of corky root resistance as 'Montello' and 'Green Lake' but produced slightly smaller heads in winter. Florida 49014 and 49015 produced heaviest heads. These lines were susceptible to corky root rot but tolerant to lettuce mosaic virus. In addition, Fl. 49015 was resistant in these tests to the race of downy mildew that caused extensive damage to all other entries in winter and early spring. Florida 49014 and 49015 had significantly more brown rib and tipburn than other entries. These disorders were not present in the winter plantings. 'Montello' had significantly more cracked ribs than Fl. 44063. The main component affecting yield and quality was weather during the growing season. Mean temperatures 50°F or below with low light intensity and short days, or mean temperatures above 70°F with longer days resulted in lower yields and quality. Presence of corky root rot was the second most important factor restricting yield.**

Crisphead lettuce production in Florida increased in the last 10 years to approximately 10,000 acres with an estimated value of $23 million (2). Most crisphead production is centered in the Everglades. New York cultivars developed by Dr. J. G. Raleigh from Cornell University (5) were the foundation cultivars for the industry until recently, when corky root rot became the limiting production factor. The cultivars 'Montello' and 'Green Lake', developed by Dr. L. Sequiera (6) from the University of Wisconsin and released in 1978, are corky root rot (CRR) tolerant and are now the predominant cultivars. However, tests conducted with these cultivars before their release showed them to be susceptible to rib cracking under Florida conditions. A breeding program was begun at Belle Glade in 1976 to in-

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