2005 - 2006 - 2007 Specialty Melon Project

In 2005 and 2006, as part of a larger program of NRI research, melons were trialed at the CSU Horticultural Research Center using both certified organic and conventional growing systems. In 2007 a longer list of melon varieties was trialed at the same research center for Seeds of Change using organic growing methods exclusively. The yield data collected for all three years has been reduced for this report to include the melon count per plant, weight per melon (pounds) and total yield per plant (pounds). The data is being reported in this manner so that multiple years of results can be directly compared. In addition, a limited amount of data on the dissolved sugar to water mass ratio (Brix) was collected for 2007.

The year specific data graphs include all varieties listed in descending order beginning with the variety producing the largest fruit in that year. For each year, that hierarchy of varieties changed. To assess that variability, varieties planted in all three years were compared across years to evaluate the effect of three distinct growing seasons.

2005

Yields for 2005, as, weight per melon, are first presented in Figure 1 to assess the difference between organic and conventional treatments. Tests of significance between the different varieties can be assessed by comparing the error bars. Overlapping error bars between treatments (organic vs. conventional) and varieties indicates that the differences were not statistically significant. The data show that there was no difference in individual melon weight between the two cropping systems. The difference between melons is represented by the letters located at the base of the conventional treatment column. Mean weights per melon for the combined treatments were assessed using t-tests. Varieties with the same letter are not significantly different.





Figure 2 presents the melon count per plant with the varieties in the same order as Figure 1. As with Figure 1 there was not significant difference between the organic and conventional cropping systems. This is shown by the overlapping error bars. Differences in varieties using the pooled data from treatments is shown by the letter bar in positioned above the columns. Like Figure 1, varieties with the same letter are not significantly different.



Figure 3 presents a combination of the data presented in Figures 1 and 2. Overall plant production was calculated by multiplying melon size by melon count per plant. The single column represents the combination of organic and conventional treatment data. As with Figures 1 and 2, varieties with the same letter are not significantly different. From the data we can see that total fruit production is controlled, to a greater degree, by fruit weight than fruit count. Total plant productivity was the highest for Rayyan, Honey Orange and Arava, the three varieties with greatest fruit size. The variety with the lowest total plant productivity was Sweetie No6, which was the variety with the smallest fruit size. However, total plant productivity For Sweetie No6 was not significantly different from varieties Edonis or Savor.

2006

Data for 2006, presented in Figure 4, show that melon weights were lower than in 2005. The two varieties with the largest fruit size, Rayyan and Honey Orange, remained the same in 2006. Sweetie No6 produced the smallest fruit in 2006 but the remaining varieties shifted their hierarchy with respect to fruit size when compared to 2005.

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Figures 5 and 6 show a definitive change from 2005. Fruit count and total fruit production were lower than in 2005. Also, there was a definite trend of increased production in the conventional cropping system. Statistically significant treatment effects in total fruit production were identified for the varieties Rayyan, Early Queen and Haogan. Those differences preclude the pooling of data from the two cropping systems for comparison across years. For that reason only the data from the organic cropping system will be used and compared directly to the 2007 data which represents only organically grown melons.





2007

In 2007, 31 varieties were trialed including eight of the varieties trialed in 2005 and 2006. Rayyan and Burpee Hybrid were

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the two varieties not included. Figure 7 presents the weight per melon in descending order. Orange highlighted varieties were grown in all three years of this study. Corresponding Brix measurements for selected varieties are included. The variability in Brix measurements is a function of many factors including; harvest date, sunlight penetration through the canopy and gradients of sugar within the fruit. All fruits were harvested when they were ripe, as determined by aroma and taste. The Brix values provide a quantitative assessment of those qualitative traits.

The added varieties in 2007 produced a much broader range of fruit sizes from the eight pound Mega Brew to the 2 pound Sweetie No6. Figure 8 presents the melon count per plant in the same order as Figure 7. While Sun Jewel and Sweetie No6 show and inverse relationship between small melon size and high fruit count, that relationship is very variable among the other varieties. A high crop load often translates into smaller fruit so that total fruit production by weight approximates the total photosynthetic activity across the growing season. That relationship is not very strong in 2007. A regression of fruit count on fruit size shows significance p=0.029 but only explains 15 percent of the variability (R2 = 15.5).







Figure 9 presents the total fruit productivity for 2007. Like 2005 and 2006, the order of varieties is based on weight per fruit and the relationship is highly variable. For a better understanding of the highly variable relationship between weight per fruit and fruit count, Figure 10 plots these values along with a regression line for each year and treatment.



The data show that in 2006, the year with the best correlation, there is a positive relationship so that, as fruit count increases, weight per fruit increases. That is counter intuitive for a year with the lowest overall production of the three years measured.

Figures 11 and 12 present multiple year data for the eight varieties grown in all three years. Honey Orange and Arava had the heaviest average fruit weight in all three years and Sweetie No6 had the lightest. The other five varieties fell between these endpoints and varied year to year. Fruit count for all varieties was quite variable and showed no trends from year to year.

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Photo	Variety	Туре
	Early Brew	Honeydew

Colorado Line Horticulture Landso Knowledge to Go Places	ape Archite	cture College of Agricultural Sciences
	Edonis	Charentais
	Galia	Galia
	Halona	Muskmelon

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HAOGAN 3	Haogen	Galia/Tropical
	Honey Orange	Honeydew
	Honey Pearl	Honeydew

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	Honey Yellow	Honeydew
	Passport	Galia
Regarding the second se	San Juan	Persian

Colorado State, Knowledge to Go Places Horticulture Landso	ape Archite	cture College of Agricultural Sciences
	SnowMass	Honeydew
	Strike	Western Shipper Muskmelon
	Sugar Nut	Honeydew

Colorado State Enowledge to Go Places Horticulture Landso	ape Archite	cture College of Agricultural Sciences
	Sun Jewel	Asian Melon
	Sweet Granite	Muskmelon
	Western Express	Western Shipper Muskmelon

Colorado State University Knowledge to Go Places	orticulture Landsc	ape Archite	cture College of Agricultural Sciences
		Wrangler	Western Shipper Muskmelon