Local mango types are known as Mayagüezano, Redondo or Pasote mangos. Mayagüezano mango, which is more abundant in western Puerto Rico, is produced mostly for local consumption, processing, and recently, after the establishment of a hot water facility in the municipality of Rincón, for fresh fruit export to the United States. Mayagüezano mango production is different from that of selected varieties originally (mostly) from Florida, U. S. A. There are commercial orchards of those (2, 3, 4, 5, 6), while Mayagüezano mangos are currently produced by trees growing alongside roads or in pasturlands. Good prices and a growing export market to the eastern United States have created interest among farmers, who have little information on fruit quality and other characteristics.

During FY 2004, 3.76 million fruits of Mayagüezano mango were marketed, with a value of $244,000.00. During FY 2005, 4.2 million fruits were marketed, with a value of $268,000.00 (1). The Mayagüezano mango has been a neglected fruit in Puerto Rico, and no research has been conducted on selection and evaluation of germplasm. It is propagated from seeds, which contain polyembryonic embryos that produce true type seedlings. Variants of this type exist, both for tree and fruit traits. Trees vary from almost dwarf (fifteen feet or less) to giant (thirty feet or more). Fruits may vary from less than 125 grams to over 250 grams; and fiber content from almost stringless to very fibrous. This fruit is used as fresh fruit, green fruit (exported to ethnic markets in the US, such as Southeast Asians), for preserves and as filling for mango roll (brazo gitano).

Germoplasm is collected at the western municipalities of Aguada and Lajas. During the last twenty years or so many trees have been downed to expand roads and other developments, with no consideration to their genetic and agricultural value. This results in decreased production and the elimination of valuable germplasm.

Germoplasm was evaluated by sampling fruits from existing trees throughout the western region of Puerto Rico. They were collected at the green ripe and ripe stages and sent to the Food Science and Technology Laboratory for analyses such as physical size, skin color, etc., as well as disease tolerance and compositional (amount of pulp and fiber, pulp color, firmness and shelf life) characteristics of the fruits, fruit value, possible industrial uses, organoleptic and product acceptance, skin and seed evaluation for food and industrial uses, and chemical analyses as needed.

Germoplasm with superior characteristics was then selected for asexual propagation in 2001, through grafting on Banilejo stock, at the Juana Diaz Agricultural Experiment Station. The new, grafted trees were field planted at the Lajas Substation 5 march 2002, on a Fraternidad series soil (Order: Vertisols). Twelve selections were chosen. The experimental design consisted of two replications, each consisting of four trees of each selection planted at 9m by 9m. Fertilization, irrigation, weed control and other practices have been conducted according to the Technological Package for Mango Production, a publication of the UPR Agricultural Experiment Station.

The cultivars were selected mostly on the physical and compositional characteristics of their fruits. The twelve cultivars were Banilejo III (B3), Banilejo IV (B4), La Finca (Fc), Cedeño (Ce), Chico Dulce (Cd), La Curva (Cu), Koko Rosado (KR), Juan Pérez (JP), El Loco (Lo), Alvaro (Al), Carmelita (Ca) and Villa Flor (VF). Measures on height, stem circumference (2003, April 2004, August 2005 and May 2006). Measures on trunk and graft diameters were taken March 2003, April 2004 and August 2005. Measures on trunk and graft circumferences were taken May 2006. For the first year, measurements were significantly taller than the rest, but that advantage was soon lost during the second year, when there were no significant differences on height among the tallest ten of the twelve clones. Then, on the third year, again Carmelita was significantly taller than the rest, and remained so for the fourth year. “Villa Flor” and “Chico Dulce” were the second and third tallest during the third and fourth years. “La Curva”, “Banilejo III”, “Banilejo IV”, “La Finca” and “Koko Rosado” were the shortest during the first year. “Alvaro” and “La Finca” were the shortest during the second year. “Banilejo III”, “Banilejo IV” and “La Curva” were the shortest during the third year, and remained so during the fourth year. (Fig 1).

As for diameter of the trunk, “Carmelita”, “Villa Flor” and “Banilejo IV” were significantly wider than the rest during the first year. During the second year, “Koko Rosado”, “Banilejo IV”, and “Carmelita” were significantly wider than the rest. During the third year, “Carmelita” regained its advantage and was significantly wider that the rest; “Villa Flor” and “Chico Dulce” were the second and third widest on this occasion. As for circumference of the trunk (May 2006), “La Finca” showed a significantly wider trunk than Carmelita”, “Villa Flor” and “Chico Dulce”, “La Curva”, “La Finca”, “Alvaro” and “Cedeño” were the thinnest during the first year. For the second year, there were no significant differences among the seven thinnest. Then, for the third year, “Banilejo III”, “La Curva” and “Banilejo IV” were significantly thinner than the rest. As for circumference of the graft (May 2006), the twelve cultivars were divided into four significant groups. As for circumference of the trunk (May 2006), “La Finca” and “Carmelita” showed significantly higher values than the rest, followed by “Chico Dulce” and “Villa Flor”. For the second year, there were no significant differences among the seven thinnest. Then, for the third year, “Carmelita” turned out to be significantly wider than the rest (followed by “Alvaro”, “Chico Dulce”, “Villa Flor”, “Juan Pérez” and “Koko Rosado”, with no significant differences among the rest). For the fourth year, “Banilejo III” showed a significantly lower value than the rest. During the second year, “El Loco”, “La Curva”, “Koko Rosado”, “Banilejo IV”, and “Carmelita” were significantly wider than the rest. For the second year, “La Finca” was significantly thinner than the rest. For the third year “Banilejo III” and “Banilejo IV” were significantly thinner than the rest. Finally, for the fourth year (circumference), “Banilejo III” and “Banilejo IV” showed a significantly lower value. (Fig 3).

There is a fourth parameter that was measured for the first time in May, 2006, after the trees attained a certain size: canopy volume. The width of the treethops was measured from North to South, and then from East to West using a mathematical formula [V=0.5244*H*(W+2.2)], these two data were converted to volume. “Carmelita” showed a significantly higher value for this parameter, followed by “Villa Flor”, which in turn was significantly higher than the third, fourth and fifth highest values. “Alvaro”, “Chico Dulce” and “Juan Pérez” (there were no significant differences among them). “Banilejo III”, “Banilejo IV” and “La Curva” showed significantly lower values than the rest. (Fig 4).

These are preliminary results that may change through time. However, they allow us to see some significant trends. For example, Carmelita, Villa Flor and Chico Dulce can be expected to be large trees, as suggested by their height and treetop volume. On the other hand, Banilejo III, Banilejo IV and La Curva seem to show a tendency to remain small. Should these three cultivars turn out to be good producers, a closer planting distance might be recommended, thereby increasing yield per unit of land.

Selected Literature