Fruit Growers of SWFL

OCTOBER 2022

the Bonita Springs **tropical fruit** club

The October Meetings of the Bonita Springs Tropical Fruit Club will be held 2nd & 4th Saturdays, October 8 and 22, at 4:30 pm at Bonita Springs Fire Control & Rescue District Station 2701 Bonita Grande Drive, Bonita Springs, FL 34135
Both events will be a 'potluck' events, please bring a dish or dessert.

GROW FRUIT!

VENUE CHANGE

The Collier Fruit Growers Monthly Meeting will be Monday, October 17th, starting at 7:00 pm.
The Crown Pointe Clubhouse
2424 Piccadilly Circus, East Naples, Florida 34112
Enter through the east door (Collier Blvd.) side of the Administration Building.

The Monday, October 17 program of the monthly meeting will be on the Propagation and grafting of fruit trees. Propagation methods for various trees will be discussed. Participants will be able to have their questions answered. The benefits of establishing a 'mist house' for seed propagation in south Florida will be discussed. Grafting methods will be discussed and here will be live demonstrations of grafting mango, avocado and Annona seedings. Meeting participants will have the opportunity to sign up for a mango grafting class on Thursday, October 22, or Saturday, October 24 following the meeting. Each of the two classes will be held between 9:00 am and 1:00 pm each day at the Collier County Extension Service facility on Immokalee Road in North Naples.

Collie Fruit Growers' Tree Sale

Due to Hurricane Ian, the November sale is canceled.

Fruits which Ripen in October

Atemoya, banana, Barbados cherry, carambola, carissa, coconut, fig, guava, jackfruit, kwai muk, macadamia nut, miracle, fruit, monstera, Otaheite gooseberry, papaya, passion fruit, peanut butter fruit, pomegranate, Spanish lime, guanabana (soursop), strawberry tree, sugar apple.
Annual fruits: beans, eggplant, hot peppers, okra, cherry tomatoes, winter squash (Cushaw/ Seminole pumpkin), watermelon.

Growfest - Fruit and Spice Park, Saturday/ Sunday, October 15-16, 10:00 am -5:00 pm Homestead, Miami-Dade County

A CELEBRATION OF ALL THINGS EDIBLE, GREEN, AND GROWING! Grow Fest is about connecting the dots between the farmer garden and the dinner table. It is about providing the knowledge and material to grow, forage, buy, prepare, and eat good, local, seasonal food. Engaging the public, encouraging, and giving them the tools to grow some of their own will enable them to gain a better appreciation of what it takes for farmers to produce the food we all eat, and whet folks' appetites for the best, healthiest, and freshest produce. Note: External promo or coupons cannot be applied for this special event. NO PETS ALLOWED.
Tickets are $15.00 for adults, $8.00 for children ages 6 to 11, and may be purchased at beeheavenfarm.com
The Park is located at 24801 SW 187th Avenue, Homestead, FL 3303

Brie and Papaya Quesadillas

We are blessed here in Southwest Florida with a perfect climate for growing papayas. Many of us even have our own trees and are constantly looking for ways in which to use this delicious fruit. Here is a recipe that can be made for an appetizer or as an entrée.

Makes four entrée servings or twelve appetizers.

Ingredients:
- ½ red onion, quartered and thinly sliced.
- ⅓ papaya, peeled sliced and diced.
- 1 jalapeno pepper seeded and diced.
- ½ - 1 cup fresh cilantro, stemmed and minced.
- Juice of 1 lime.
- 4 large flour tortillas.
- 8 oz. Brie cheese, rind removed and thinly sliced.
- 2 Tbsp. olive oil.

Instructions:
Soak the onion slices in a small bowl of water for 20 minutes. Drain well and pat dry. Combine the onion, papaya, jalapeno, and cilantro in a medium sized bowl. Add the lime juice and stir gently.
Preheat oven to 400 degrees F. Lay the tortillas out flat on a cookie sheet. Place the Brie slices on one half of each tortilla. Top the Brie with the Papaya mixture. (Note: Do not fill too full of they will be difficult to flip.) Fold each tortilla in half. Brush the top of each quesadilla with a little olive oil. Bake in oven for 5 to 7 minutes. Flip quesadillas over and brush again with olive oil. Bake 5 to 7 minutes longer until the cheese is melted, and the tortillas are lightly browned. Cut into thirds and serve warm.
You can also make these on a griddle or a skillet. Spray with vegetable oil spray and cook until crisp omitting the brushing with olive oil.
Recommend serving with a dollop of sour cream or salsa.
Fruits which Ripen in October
Atemoya, banana, Barbados cherry, carambola, carissa, coconut, fig, guava, jackfruit, kwai muk, macadamia nut, miracle fruit, monstera, Otaheite gooseberry, papaya, passion fruit, peanut butter fruit, pomegranate, Spanish lime, guanabana (soursop), strawberry tree, sugar apple.
Annual fruits: beans, eggplant, hot peppers, okra, cherry tomatoes, winter squash (Cushaw/ Seminole pumpkin), watermelon.
Trimming Mango and Avocado Fruit Trees
Many amateur growers would like to know the best way to trim their Mango and Avocado trees. There seems to be a lot of confusion, but numerous instructional videos reside on YouTubetm which one may find helpful to various degrees. Attention to the trees yearly growth cycle is extremely important.

Links to two of the ‘better ones’ are:
Mango: https://www.youtube.com/watch?v=mcppwOcfCZA
Avocado: https://www.youtube.com/watch?v=ygnk_ydeVsg

How a Carnivorous Mushroom Poisons Its Prey

Scientists have known for decades that oyster mushrooms feasted on roundworms—and they've finally figured out how their toxins work.
Published in 'Scientific American' by Jennifer Frazer on April 8, 2021

In the 1980s, scientists discovered that oyster mushrooms are carnivores. The delicious, inescapable inference is that they're the only vegan food that can itself eat meat.

The meat in question is definitely meat, too. [Parasitic] nematodes, also called roundworms, are little animals complete with guts, nerves, muscles and their own primitive form of hopes and dreams. Oyster mushrooms poison and paralyze nematodes within minutes of contact, inject their filaments into the corpses, dissolve the contents and absorb the slurry.

What was not known was how this fungal poison worked, or how extensive its powers were. A team of Taiwanese scientists that sought to answer those questions published their results last March in the Proceedings of the National Academy of Sciences. They discovered that the fungus targets a part of the worms so indispensable that nematode species separated by more than 280 million years of evolution were equally susceptible.

Before proceeding, however, it's important to emphasize that oyster mushrooms are far, far from alone among fungi in their eating habits, probably because nematodes are the most abundant animals in soil. The little worms are so common that were the entire planet except nematodes dissolved, a dimly visible Earth-shaped shell of nematodes would be left floating in space.

So, it is perhaps not surprising that this embarrassment of high-quality protein spurred an outburst of fungal evolution. Even so, the sheer devious ingenuity, diversity, and abundance of the devices with which fungi responded to the challenge is grimly awe-inspiring.

For example, a few species in a group of fungus-like organisms called oomycetes send nematode-sniffing hunter cells in pursuit of the worms, as do a few species of true fungi called chytrids (the same group that produced the pathogen that has decimated amphibians). They're like something out of The Matrix, except in swimmy fungus form. Once their target is acquired, they "encyst" near the mouth or anus before injecting themselves into the worm and attacking its internal organs.

Next

A second group of oomycetes in the genus Haptoglossa manufactures infective “harpoon cells.” These prey-seeking pressurized nematode guns are programmed to glue themselves to a surface, barrel pointed upward. When a nematode blunders into it, a line of weakness snaps, deploying a harpoon that injects enough of the Haptoglossa spore to seal the worm’s demise. Although a similar apparatus is famously found in the stinging cells of jellyfish and coral, this appears to be a completely independent invention of pretty much the same equipment.

Some fungi produce booby-trapped bonbons. These spores have various irritating shapes like sickles, stilettos or—no kidding—chick-shaped marshmallow peeps, all of which seem calculated to lodge in nematode esophagi like fish bones in a diner’s throat. They must be tasty because nematodes swallow them anyway. Once comfortably ensconced, they germinate by puncturing the worm’s gut and then kill and eat it.

Other fungi have evolved sticky branches, knobs or nets coated with nematode super glue. Worms can apparently taste this glue and may violently recoil, a reflex that must sometimes save them. On the other hand, it must work most of the time because at least 40 species of fungi produce such nets.

Then there are the death collars, lethal jewelry that unsuspecting worms swim through, detach, and flaunt while they wander about for a bit—all the better to disperse the fungus—before the ring inevitably injects itself into the nematode, and, well … you know the rest.

A variation on this theme is the inflatable hoop trap. At least 12 different fungal species make constricting snares that inflate like lethal water wings in a tenth of a second. The fungal squeeze is fatal.

These are physical traps, but chemicals can do the job too.
Based solely on appearance, the cream-colored, shellfish-shaped Pleurotus ostreatus is not a fungus you’d suspect of carnivory, but scrutiny of its diet does suggest a need. As everyone who’s hunted or cultivated oyster mushrooms knows, they are wood rotters that are among the first creatures to take a crack at dead trees. As anyone who’s ever tried to eat wood knows, it’s memorably protein-poor.

When starved, the filaments of Pleurotus that live inside wood produce poison drops. Minutes after nematode noses nudge them, the worms’ wriggling slows and stops.

In the present study, all 15 species of Pleurotus fungi the team tested had this ability. Then they chose 17 species of nematode to see if any could survive the poison. None did. The scientists concluded that the mechanism of paralysis had been conserved by evolution across nematode lineages that diverged an estimated 280–430 million years ago.

The scientists suspected that calcium may play a role in the action of the poison. Animal muscles contain extensive calcium storehouses. When nerves tell the muscles to move, the calcium is released and stimulates contraction. When nerves tell them to stop, pumps refill the storehouses with calcium, and the muscle relaxes.

To investigate how the fungus was pulling this off, the scientists created worms with visible calcium and discovered that the ion flooded the pharynx and head muscles of poisoned worms—and stayed there. Very quickly, neurons and muscle cells died in droves.

Thus, the fungal poison probably irreversibly opens a calcium gate and/or jams the calcium pumps that re-stow it. Without a way of putting the calcium back where it belongs, the worm ends up in a rigor mortis that induces death.
Next, by randomly mutating nematodes and looking for poison-resistant individuals, then sequencing the mutants' genes to see what got broken, the scientists deduced that the fungal poison can only act if the worm makes intact sensory hairs called cilia.

These 60 or so enervated antennae project from the roundworm fuselage and are used to smell, taste, touch, take the temperature, and otherwise sense their environment. Because worms that can't make functional cilia (rendering them immune to oyster poison) also can't sense their environment (rendering them blind), it is likely that mutants that can escape Pleurotus cannot survive in the wild, the scientists inferred.

Further tests revealed that the Pleurotus poison's mechanism is distinct from that of all current nematicides. Nematodes are important parasites of plants, livestock and humans, and resistance to nematicides is growing. A potential drug so completely unknown, broadly effective, and seemingly resistance-proof is decidedly intriguing.

It's not even the only one. Remember those fungi that make sticky nets? Some of them—and they're completely unrelated to Pleurotus—also render nematodes comatose within an hour.

This is an opinion and analysis article.

About the Author

Jennifer Frazer, an AAAS Science Journalism Award–winning science writer, authored The Artful Amoeba blog for Scientific American. She has degrees in biology, plant pathology and science writing. Follow Jennifer Frazer on Twitter
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Yield and Fruit Quality Traits of Atemoya Hybrids Grown in Puerto Rico

Ricardo Goenaga[1] and David Jenkins

ADDITIONAL INDEX WORDS. tropical horticulture, tropical fruits, soluble solids concentration, *Annona squamosa* × *A. cherimola*

SUMMARY. As consumers seek healthy and more diverse food products, the demand for tropical fruits has increased significantly during the last 15 years. There is a lack of formal experimentation to determine the yield performance and fruit quality traits of atemoya (*Annona squamosa* × *A. cherimola*) hybrids. Six atemoya hybrids ('Bradley', 'Geffner', 'Priestly', 'Lisa', '47-18', and '75-9') grown on an Oxisol soil were evaluated for 4 years at Isabela, PR. 'Geffner' and 'Lisa' had the highest number of marketable fruit averaging 8542 fruit/ha, and the highest yield of marketable fruit, averaging 1507 kg·ha^{-1}; they did not differ from each other, but were greater than all other hybrids. Individual weight of marketable fruit was significantly higher in '75-9' and 'Priestly' which averaged 264.8 g. Significantly higher soluble solids concentration values were obtained from fruit of '75-9', 'Bradley', and 'Geffner' which averaged 23.8%; they did not differ from each other, but were greater than all other hybrids.

As consumers seek healthy and more diverse food products, the demand for tropical fruit has increased significantly during the last 15 years with an estimated value of production at $18 billion in 2009 (Food and Agriculture Organization of the United Nations, 2011). Belonging to the Annonaceae family, the atemoya is an interspecific hybrid between the sugar apple (*Annona squamosa*) and the cherimoya (*Annona cherimola*) (Nakasone and Paull, 1998). The sugar apple is indigenous to the highlands of Peru and Ecuador, and the cherimoya is widely distributed throughout tropical South America (Marler et al., 1994). However, the term atemoya has also been used loosely in the literature for *Annona* hybrids resulting from 1) crosses between custard apple (atemoya × *A. reticulata*), 2) cherimoya × *A. reticulata*, and 3) for hybrids in which either *A. squamosa* or *A. cherimola* is used interchangeably as male or female parents. In this paper, we use the term "atemoya" as the collective term for all these *Annona* hybrids.

The atemoya grows well in tropical and subtropical climates from sea level to an elevation of ≈1000 m. It adapts to a wide range of soil types including sandy or heavy soils; however, it does not withstand waterlogged soils particularly when it is grafted onto sugar apple (Crane et al., 2013; Morton, 1987). In Florida orchards, atemoya budwood is usually grafted onto custard apple or sugar apple rootstocks; however, the most commonly used rootstock in Israel is the cherimoya (Campbell and Phillips, 1994; Morton, 1987).

Poor fruit set is the key obstacle for the cultivation of atemoya. The atemoya flowers exhibit protogynous dichogamy (female function precedes male function). This incompatibility problem results in incomplete pollination and the production of malformed fruit (Mossler and Crane, 2012). For this reason, hand pollination is often necessary to achieve profitable yields. Lack of pollinators also limits fruit set. Nitidulid beetles (*Carpophilus* sp. and *Urophorus* sp.) are the single most important pollinators of atemoya flowers and other annonaceous crops (Nadel and Peña, 1994). Fruit shape varies from conical to ovate; it has slight to pronounced surface protuberances, green-to greenish-yellow skin and contains 10 to 40 dark brown to black seeds. Fruit pulp is white, smooth textured, sweet with a custard-like consistency (Campbell and Phillips, 1980; Crane et al., 2013). The fruit is high in dietary fiber and vitamin C and can range in weight from 200 to 900 g (Meadows and Oswald, 2012).

There is very little information available on total production area of atemoya worldwide. The largest producer in the United States is Florida, with annual production estimated at 50,000 lb and an average seasonal price of ≈$4.00/lb (Mossler and Crane, 2012). In the United States, small orchards are known to have been established in Hawaii, CA, and Puerto Rico.

Commonly used hybrid cultivars for commercial production include Geffner, Page, African Pride, and Bradley (Crane et al., 2013). Production of fully matured trees of these hybrids is estimated to range from 75 to 200 fruit/year (Crane et al., 2013). However, results from long-term replicated field trials to evaluate these and other hybrids are very limited (Crane et al., 2013). The objective of this study is to evaluate the yield performance and fruit quality traits of six atemoya hybrids grown in an Oxisol typical of the humid tropics.

Materials and methods

This study was conducted in Puerto Rico at the U.S. Department of Agriculture, Agricultural Research Service Research Farm in Isabela

Units

To convert U.S. to SI, multiply by	U.S. unit	SI unit	To convert SI to U.S., multiply by
0.4047	acre(s)	ha	2.4711
0.3048	ft	m	3.2808
3.7854	gal	L	0.2642
2.54	inch(es)	cm	0.3937
25.4	inch(es)	mm	0.0394
0.4536	lb	kg	2.2046
1.1209	lb/acre	kg·ha^{-1}	0.8922
28.3495	oz	g	0.0353
1	ppm	mg·kg^{-1}	1
6.8948	psi	kPa	0.1450
(°F − 32) ÷ 1.8	°F	°C	(°C × 1.8) + 32

USDA-ARS, Tropical Agriculture Research Station, 2200 P.A. Campos Avenue, Suite 201, Mayaguez, Puerto Rico 00680-5470

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Mention of trade names or commercial products in this publication is solely for the purpose of providing specific information and does not imply recommendation or endorsement of the U.S. Department of Agriculture.

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(Coto clay: clayey, kaolinitic isohyperthermic Typic Hapludox). The soil has a pH of 5.68, 154 mg·kg^{-1} ammonium-nitrogen (NH_4-N), 6.2 mg·kg^{-1} nitrate-nitrogen (NO_3-N), 5.8 mg·kg^{-1} phosphorous (P), 63.5 mg·kg^{-1} potassium (K), 1192 mg·kg^{-1} calcium (Ca), 93 mg·kg^{-1} magnesium (Mg), 39 mg·kg^{-1} iron (Fe), 245 mg·kg^{-1} manganese (Mn), 2.80 mg·kg^{-1} zinc (Zn), and 1.42% organic carbon. The 95-year (1919–2014) mean annual rainfall is 1649 mm and Class A pan evaporation is 1672 mm. Mean monthly maximum and minimum temperatures are 29.8 and 19.9 °C. Soil samples were taken 2 months before planting by taking 15 borings at a depth of 0–10 inches from each of the projected hybrid rows. Samples were air-dried and passed through a 20-mesh screen. Soil pH in water and 0.01 M calcium chloride (1 soil : 2 water) were measured with a glass electrode. Exchangeable cations (potassium, magnesium, and calcium) were extracted with neutral 1 N ammonium acetate and determined by atomic absorption spectroscopy (Sumner and Miller, 2007). Phosphorus was extracted with 1 N ammonium fluoride and 0.5 N hydrochloric acid and determined using the ascorbic acid method (Benton, 2001). Organic carbon was determined by the Walkley–Black method (Nelson and Sommers, 2007). Soil ammonium and nitrate were determined by steam distillation (Mulvaney, 2007). Originally, the experiment was also established at a second location in a clayey, mixed, isohyperthermic Aquic Haplohumults Ultisol soil. However, a combination of this site having a very heavy, clayey soil and a prolonged wet period due to heavy rainfall caused high mortality among plants forcing us to end research at this site.

Six-month-old trees of hybrids 'Bradley', 'Geffner', 'Priestly', 'Lisa', '47-18', and '75-9' grafted onto 'Lessard Thai' sugar apple rootstock were transplanted to the field on 8 Aug. 2001 and were arranged in a randomized complete block design with four replications. 'Bradley' is one of the first named selections of atemoya. 'Geffner' and 'Priestly' are Israeli selections (Morton, 1987). 'Lisa' is 'Libby' cherimoya × 'Red Sugar' sugar apple, '47-18' and '75-9' originated from controlled pollination crosses of 'Geffner' atemoya × 'San Pablo' *A. reticulata*, and 'Spain' cherimoya × 'Felipe Canul' *A. reticulata*, respectively. All plant material was obtained from Zill's High Performance Plants (Boynton Beach, FL) and shipped air freight to Puerto Rico. 'Lisa', '47-18', and '75-9' are atemoya hybrids developed in that nursery by Mr. Gary Zill and have shown commercial potential in nonreplicated plots at the nursery. Before transplanting, the soil was chisel plowed to a depth of 90 cm. Planting holes of 1.5-ft depth were dug with an auger connected by a drive shaft to the power-take-off unit of a tractor. On transplanting day, each grafted tree received 11 g granular P provided in the form of triple superphosphate. Within a replication, plots for each hybrid contained two trees spaced 4 m apart and 6 m between adjacent rows in a triangular array, 168 trees/acre. As an effort to identify hybrids not needing artificial pollination, hand pollination was not performed in this study. This experiment was surrounded by two guard rows of custard apple seedlings.

Irrigation based on tensiometer readings was provided through drip irrigation with two 2-gal/h emitters per tree spaced 1.8 m apart when the soil water tension at a depth of 12 inches exceeded 50 kPa. Fertilization was provided every 3 months using a 15N–2.2P–16.3K–1.8Mg fertilizer at a rate of 185 lb/acre. Herbicide (glyphosate) for weed control was applied only in strips within the planting row. Weeds between rows were controlled with a tractor mower.

Harvests were initiated in Jan. 2006. At this time, experimental trees were 6 years old and producing fruit

Fig. 1. Representative fruit of six atemoya hybrids grown in Puerto Rico.

in sufficiently large numbers for commercial harvest and sale. At each harvest, number and weight of marketable and nonmarketable fruit were recorded. Deformed fruit and those weighing less than 150 g were considered nonmarketable. Representative fruit from each hybrid is shown in Fig. 1. Fruit totaling 10% of those harvested were used to determine total soluble solids using a temperature-compensated digital refractometer (Pal-1; Atago, Tokyo, Japan) when the fruit ripened at room temperature (≈75 °F), ≈5 d after harvest. After a 4-year harvesting period, the experiment was ended in Dec. 2009.

Analysis of variance was carried out using the GLM procedure of SAS (version 9.1 for Windows; SAS Institute, Cary, NC). After significant F test at $P = 0.05$, means separation was performed using Tukey's Studentized range test.

Results and discussion

Year, hybrids, and the year × hybrid interaction showed highly significant effects ($P \leq 0.01$) on all fruit parameters measured in the study (Table 1). The only exception was total soluble solids, which did not show a significant year effect.

As expected, all hybrids exhibited an overall increase in the number and yield of marketable fruit as trees increased in age (Table 2). However, the magnitude of this response varied among hybrids as expected by the significant year × hybrid interaction (Table 1). Years of heavy cropping were followed by lower production and yield of marketable fruit the following year for particular hybrids (Table 2). Most probably, the high fruit load in some cultivars resulted in depletion of assimilates, which then caused an "off-year" because of light blooming as trees built up carbohydrate reserves (Scholefield et al., 1985). This was particularly the case for 'Geffner' in 2007–08 and 'Lisa' and '75-9' in 2008–09 (Table 2). 'Bradley' was the only hybrid showing relatively stable marketable fruit production and yield. The fact that it did not have a year of heavy cropping supports the hypothesis of assimilate depletion in other hybrids.

'Geffner' and 'Lisa' had the highest 4-year mean for number and yield of marketable fruit with values being significantly higher than for all

Table 1. Yield and fruit quality traits of six atemoya hybrids planted in Puerto Rico. Values are means of four replications and 4 years (2006–09).

Hybrid	Marketable fruit (no./ha)[z]	Nonmarketable fruit (no./ha)	Total fruit (no./ha)	Marketable fruit yield ($kg \cdot ha^{-1}$)[z]	Nonmarketable fruit yield ($kg \cdot ha^{-1}$)	Total fruit wt ($kg \cdot ha^{-1}$)	Individual marketable fruit wt (g)	Individual nonmarketable fruit wt (g)	Percent non marketable fruit (%)	Total soluble solids (%)
Geffner	8,477	13,515	21,992	1,409	1,022	2,430	187.4	77.7	61	23.3
Lisa	8,607	6,419	15,026	1,605	580	2,183	192.7	91.6	43	19.2
Bradley	2,448	3,281	5,729	478	278	756	208.3	88.3	57	24.0
Priestly	3,737	573	4,310	857	55	912	252.2	94.7	13	18.5
47-18	2,604	2,253	4,857	568	207	775	211.5	89.1	46	18.8
75-9	2,721	1,250	3,971	727	117	844	277.4	95.6	31	24.1
Avg	4,766	4,548	9,314	941	377	1,317	221.6	89.5	42	21.6
HSD (0.05)[y]	2,477	3,130	5,022	448	258	622	0.03	0.01	17.8	4.2
Year (Y)[x]	***	**	**	***	**	**	***	***	**	NS
Hybrid (H)	***	***	***	***	***	***	***	***	***	***
Y × H	***	***	***	***	***	***	***	NS	NS	***

[z]1 Fruit/ha = 0.4047 fruit/acre, 1 $kg \cdot ha^{-1}$ = 0.8922 lb/acre, 1 g = 0.0353 oz.
[y]Tukey's honest significant difference test at $P = 0.05$.
[x]NS, **, ***Non significant or significant at $P \leq 0.01$ or 0.001, respectively, based on analysis of variance.

Table 2. Number and yield of marketable fruit of six hybrids of atemoya grown in Puerto Rico. Values are means of four replications.

	Marketable fruit (no./ha)[z]					Marketable wt (kg·ha⁻¹)[z]				
Hybrid	4 yr	2006	2007	2008	2009	4 yr	2006	2007	2008	2009
Geffner	8,477	1,875	13,125	7,760	11,146	1,409	440	1,951	1,487	1,757
Lisa	8,607	3,802	5,885	19,323	5,417	1,605	944	959	3,541	977
Bradley	2,448	1,823	2,448	2,552	2,969	478	500	368	512	533
Priestly	3,737	52	2,448	4,167	8,281	857	27	482	1,158	1,760
47-18	2,604	1,302	2,500	5,312	1,302	568	338	475	1,189	272
75-9	2,721	5,365	2,552	2,708	260	727	1,533	568	721	85
Avg.	4,766	2,370	4,826	6,970	4,896	941	631	800	1,435	897
HSD (0.05)[y]	2,477	2,413	5,330	5,752	7,232	448	665	940	1,110	1,163

[z]1 Fruit/ha = 0.4047 fruit/acre; 1 $kg \cdot ha^{-1}$ = 0.8922 lb/acre.
[y]Tukey's honest significant difference test at $P = 0.05$.

other hybrids (Table 2). These two hybrids had the highest number of marketable fruit in 2 of the 4 years the experiment lasted. However, 'Bradley' had the lowest 4-year mean for number of marketable fruit and marketable yield although values for this hybrid were not significantly different from for 'Priestly', '47-18', and '75-9' (Table 2).

Total number of fruit was significantly different among hybrids (Table 1). 'Geffner' and 'Lisa' produced a significantly higher number of total fruit; they did not differ from each other, but were greater than all other hybrids. There was no statistically significant difference in the number of total fruit produced by 'Bradley', '47-18', 'Priestly', and '75-9' (Table 1). There were no significant differences in marketable fruit production between 'Geffner' and 'Lisa' which averaged 8542 fruit/ha. Their production of marketable fruit was significantly higher than those of all other hybrids, which averaged 2877 fruit/ha (Table 1). As a percentage of total fruit production, hybrid cultivars Geffner, Bradley, 47-18, and Lisa produced a significantly higher percentage of nonmarketable fruit averaging 52% (Table 1).

Significantly higher yield of marketable fruit was obtained by 'Geffner' and 'Lisa' in comparison with all other hybrids; these yields did not differ between these cultivars, averaging 1507 $kg \cdot ha^{-1}$ (Table 1). There were no significant differences in marketable fruit yield among 'Bradley', 'Priestly', '47-18', and '75-9', averaging only 657 $kg \cdot ha^{-1}$. In spite of 'Geffner' producing a significantly higher number of total fruit than other hybrids, this did not translate in a concomitant significant increase in fruit yield. For example, 'Geffner' produced over 30% more fruit than 'Lisa' but there were no significant differences in yield of marketable fruit between these two hybrids (Table 1). The larger number of fruit produced by 'Geffner' may have resulted in high sink demand and smaller fruit.

Fewer fruit and lower fruit yield by 'Bradley', 'Priestly', '47-18', and '75-9' may have been the result of protogyny (Crane et al., 2013; Mossler and Crane, 2012) or lack of natural pollinators (Crane et al., 2013). There has been some success using nitidulid pheromones to attract pollinators into atemoya orchards, thereby increasing fruit set (Nadal and Peña, 1994; Peña et al., 1999). Preliminary work by the authors indicates that these commercially available pheromones attract nitidulid species responsible for pollination in atemoya (Jenkins et al., 2013, 2015).

Individual weight of marketable fruit averaged over hybrids was 221.6 g (Table 1). It is noteworthy that the individual weight of marketable fruit in 'Geffner' (187.4 g) was significantly lower than those for other cultivars supporting the hypothesis that the large number of fruit produced by this hybrid resulted in smaller fruit. Individual weight of marketable fruit was significantly higher in '75-9' and 'Priestly' with fruit weight values of 277.4 and 252.2 g, respectively. These weights were significantly different from each other and greater than that obtained for all the other hybrids. Individual weight of nonmarketable fruit was significantly higher (95.6 g) in '75-9' and lower (77.7 g) in 'Geffner' (Table 1).

Significantly higher soluble solids concentration values were obtained from fruit of '75-9' and 'Bradley' which averaged 24.0% (Table 1). These values are similar to those obtained by others (Chiang and Liu, 2011; Paull, 1996).

In conclusion, six atemoya hybrids were evaluated for the first time during 4 years of production. Hybrid cultivars Geffner and Lisa produced more marketable fruit and had higher marketable fruit yield than the rest of the hybrids used in this study.

Literature cited

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2022 Fresh Citrus Fruit Training
Fresh Citrus Growers, Harvesters, and Packers:

We are again making our Fresh Citrus Fruit Training bilingual program available via the internet. Companies can pick and choose what they specifically need from the following narrated modules:

- Agricultural Tractor Safety
- Worker Health and Hygiene
- Overview of Food Safety for Fresh Citrus
- Worker Protection Standards (WPS)
- CDC-Issued Guidance for COVID-19 in Agricultural Workplaces
- Chemical Hazards-Packinghouse Personnel
- Ladder Safety
- Identification of Citrus Diseases in the Packinghouse

You will need to be able to print, scan, and upload the sign-in sheet to complete the training modules. to complete the training modules. If for any reason, you could not upload the sign-in sheet, please send it to my email (amir2558@ufl.edu). There is not any specific format for the sign-in sheet, but to avoid any misspelling on certificates, please make sure that it is readable. Upon successful completion, each participant will receive a Certificate of Attendance.

The cost is only $3 per person, or a maximum of $100 per company. Certificates will be sent via email.

You can access the training at: https://crec.ifas.ufl.edu/resources/videos-and-training/fresh-fruit-packinghouse/

Please see the attached flyer for additional information.

Best wishes for the coming season!

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Mark A. Ritenour, Ph.D. | Professor – Postharvest Physiology & Handling
University of Florida, Institute of Food & Agricultural Sciences (IFAS)
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Humboldt's Global Thinking


lexander von Humboldt (1769 –1859) was a German explorer-naturalist-philosopher of the 19th century and was one of the most celebrated scientists in the world. He was elected to American Philosophical Society in 1804. Humboldt theorized that the world's environment was interconnected and that changes in the ecosystem could have ripple effects. Humboldt gained this perspective by traveling the world, taking careful and comprehensive measurements and reasonable observations. His unified theory of the environment laid the foundations for modern climate science.

Humboldt's explorations, especially in South America, made him critical of European colonization. He observed that deforestation and other changes caused by large scale farming harmed local ecosystems and the peoples who had long inhabited them.

He had an abiding and long-term interest in California, as well as California's interest in him. Now the Humboldt name is prominently featured across the California landscape: Humboldt Bay, Humboldt County, Humboldt Redwoods State Park, and elsewhere. Yet despite his desire to do so, Humboldt never visited California, or the region now known as the American West. Nonetheless, California attracted Humboldt's attention as the northern edge of the Spanish Empire and as the western border of the nascent American empire in the nineteenth century. His fascination with the region and his scientific significance help to explain all these cartographic references.

[Sandra Rebok, who has over 20 years of experience in Humboldtian scholarship, is the author of several books on Humboldt and the editor of three of his works in Spanish. Her research focuses on exploration voyages, intellectual networks, and transnational collaborations during the 19th century. One of her books examines his intellectual exchange with Thomas Jefferson (Jefferson and Humboldt, 2014), while her forthcoming monograph, Humboldt's Empire of Knowledge, analyzes Humboldt's position between the Spanish Empire in decline and the expanding United States.]

Annual Mango Calendar

As recommended by Dr. Stephen Brady

- December: Apply insecticidal soap in solution (2 oz. per gallon) twice, ten days apart.
- January – March: After first fruit reaches pea size, spray tree with Actinovatetm, a biological fungicide, in solution every ten days. Thin the fruit to two per panicle.
- March – May: Cut out any branches which may be affected by 'Malformation.' Place a pad of newspaper between touching fruit. Apply insecticidal soap every two weeks.
- May -October: Harvest your fruit when mature, but do not let them ripen on the tree.
- June – September: Spray foliage with soluble fertilizer right after you pick the last fruit. A 15-32-15 or similar formulation is fine, 1.5 Tbs. per gallon with a Spreader Sticker on a day where it will not rain for at least 24 hours.
- September – October: Tip prune summer growth and thin, as necessary. Spray with soluble fertilizer. As the next flush is approaching full size, spray with liquid minor elements.
- November: It is time to think about starting again.
-

[Note: Several members have had positive results with substituting Organocidetm, a specific blend of sesame oil, potassium sorbate, lecithin and edible fish oil to work as an insecticide, miticide and fungicide, in place of Actinovateth, a considerably more expensive treatment helping to prevent soil borne and foliar diseases.]

the Bonita Springs tropical fruit club

Who We Are & What We Do

The Bonita Springs Tropical Fruit Club, Inc., is an educational not-for-profit organization whose purpose is to inform, educate and advise members and the public in the selection of plants and trees, to encourage their cultivation, and to provide a social forum where members can freely exchange plant material and information. The club cooperates with many organizations, and provides a basis for producing new cultivars. We function in any legal manner to further the above stated aims.

General Meeting:

The General Meetings will be held on the second Saturday of each month starting at 4:30 pm. The Meetings will be pot luck dinners at the Bonita Springs Fire Control & Rescue District Station at 27701 Bonita Grande Drive, Bonita Springs, FL Please bring a dish to share.

Workshops:

Workshops will be held on the forth Saturday of each month starting at 4:30 pm. at the Bonita Springs Fire Control & Rescue District Station at 27701 Bonita Grande Drive, Bonita Springs, FL and will be pot luck dinners.. Please bring a dish to share. This open format encourages discussion and sharing of fruits, plants, seeds, leaves, insects, photos, recipes, etc. This is a great change to receive answers to specific questions.

Trips:

The club occasionally organizes trips and tours of other organizations that share our interests. The IFAS Experimental Station and the Fairchild Nursery Farm are examples of our recent excursions.

Membership:

The annual dues are $30.00 for both individuals and families. Name tags are $6 each.
Send checks to: PO Box 367791, Bonita Springs, FL 34136, or bring to any regularly scheduled meeting.

the Bonita Springs tropical fruit club

Feel free to join BSTFC on **our Facebook group**, where you can post pictures of your plants, ask advice, and find out about upcoming events!

https://www.facebook.com/groups/BSTFC/

Link to the **next meeting**: https://www.facebook.com/groups/BSTFC/events/
Meetup Link (events/meetings sync with the calendar on your phone!):

https://www.meetup.com/Bonita-Springs-Tropical-Fruit-Club/

Our **Website** (and newsletters with tons of info):
https://www.BonitaSpringsTropicalFruitClub.com/

Officers and Board of Directors:

Jorge Sanchez, President
Mario Lozano, Vice President
Tom Kommatas, Secretary
Janice Miller, Treasurer
Crafton Clift, Director
Eric Fowler, Director
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Like Us on Facebook! https://www.facebook.com/groups/BSTFC/

2022 CFG BOARD OF DIRECTORS

The Collier Fruit Growers Inc. (CFG) is an active organization dedicated to inform, educate and advise its members as well as the public, as to the propagation of the many varieties of fruits that can be grown in Collier County. The CFG is also actively engaged in the distribution of the many commonly grown fruits, as well as the rare tropical and subtropical fruits grown throughout the world. CFG encourages its members to extend their cultivation by providing a basis for researching and producing new cultivars and hybrids, whenever possible. CFG functions without regard to race, color or national origin.

REMEMBER TO RENEW YOUR MEMBERSHIP!

VISIT US AT:
www.collierfruit.org

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