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PRODUCTION POTENTIAL OF PITAYA IN THE VIRGIN ISLANDS

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ABSTRACT: Pitaya or Dragon Fruit is a cactus, closely related to the native night blooming cerius, with a large succulent fruit. Twenty-six Pitaya varieties were established in a former grape trellis wire system. Plants were set in a replicated trial at either 2 ft or 4 ft intervals. Pitaya were established and proved able to grow to the top of a six-foot trellis wire and flower within a year. Plant growth and flowering were monitored monthly and data recorded. Ripe fruit were harvested and data collected on weight, length, width, fruit flesh color and soluble sugar content. After a year of field establishment, 63% flowered and set fruit; 92%, the second year. All flowers were naturally pollinated at night by bats and moths so no hand pollination was required. Six pitaya varieties are recommended based on first year production, fruit size and sweetness. These varieties are 'Dark Star', 'Delight', 'Halley's Comet', 'Makisupa', 'Physical Graffiti' and 'Purple Haze'. Pitaya has potential for production in the Virgin Islands.

Keywords: Dragon Fruit, cactus, *Hylocereus*, *cereus*.

Introduction

Pitaya or Dragon Fruit is a cactus, closely related to the native night blooming cereus, with a large succulent fruit. Pitaya were made from three main species *Hylocereus polyrhizus*, *H. undatus*, *H. guatemalensis* and hybrids between these species (Crane and Balerdi, 2005). These fast growing cacti are epiphytic or climbing vines with a 3-sided green, fleshy, jointed, many branched stem (Crane and Balerdi, 2009). Each stem segment has three flat wavy wings (ribs) with margins and 1-3 small spines or is spineless and form aerial roots to adhere or climb. The stem may reach about 20 ft and have a lifespan of 20-30 years (Mizrahi, 1997). The large white flowers are open during the night and pollinated by bats and moths. Pitaya has characteristics that enhance its prospects as a suitable and viable commercial crop. These features include ease of propagation; low crop maintenance; the short turnaround time between planting and harvesting; and high yield potential, ranging from about 20 to 60 pounds per plant (Gunasena et al., 2006).

Materials and Methods

Twenty-six Pitaya varieties were established in a former grape wire trellis system. Plants were set in a replicated trial at either 2 ft or 4 ft intervals in a 6-row plot. Drip irrigation, with 2 ft emitters, was used for watering every other week. Fertilization was applied via an injector three times at a rate of 12.5 lb of soluble 20-20-20 fertilizer during the trial. Plants were tied with tape every month to train them until they reached the top of the trellis. Six-foot Bamboo stakes were used as support for the pitaya. Malathion

and Sevin were applied to control ants. Plants were mistreated when staff cut grass around the base with weed-eaters but basal protection was installed to halt further damage to the succulent stem. Side branches were removed to promote the growth of one stem to the top of the trellis. Six fruit characteristics were recorded from the mature pitaya: days to maturity, fruit weight, length, width, sugar content and flesh color.

Results and Discussion

Few Pitaya varieties flowered and set fruit during the first year but they all grew vigorously on the high pH calcareous soil, to reach the six-foot top of the trellis. However, the wire of the trellis was found to cut into the fleshy stems. Most Pitaya flowered and set fruit during the second year, from late May through September. After a year and a half of field establishment, 92% of the varieties flowered and set fruit. All flowers were naturally pollinated at night, so no hand pollination was required. Lower fruit set occurred on some varieties that are self-incompatible and require cross-pollination, which included 'Alice', 'Bloody Mary', 'Costa Rican Sunset', 'LA Woman' and 'Rixford'. Fruit matured 31 to 52 days after flowering (Table 1) and the fruit pulp color ranged from white, to pink to deep red. All fruit had a pinkish-red color to the outer skin regardless of the flesh color (Figure 1). The 'Natural Mystic' variety though productive was susceptible to rust on the stems and is not recommended.

Conclusion

Pitaya is a new tropical fruit for the Virgin Islands, which has become greatly popular in the continental USA for its rich natural nutrient content. Pitaya has a great potential for production in poor soil and caliche but requires good drainage. Therefore, it can be grown throughout the Virgin Islands and, being a cactus, will tolerate the dry season. After two years of growth and evaluation of 26 varieties, six self-pollinating pitaya varieties are recommended based on second year production, fruit size, color and sweetness. These varieties are 'Dark Star', 'Delight', 'Halley's Comet', 'Makisupa', 'Physical Graffiti' and 'Purple Haze'.

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Table 1. Pitaya production after two years of growth.

Variety	No. Fruits Harvested	Days to Harvest	Length mm	Width mm	Weight g	Brix %	Pulp Color
Alice*	7	30	126	61	255	16	White
Am. Beauty	5	35	208	68	115	20	Pink
Bloody Mary*	26	32	76	53	177	15	Red
Costa Rica Sunset*	20	36	70	51	97	16	Red
Cosmic Charlie	5	34	195	65	74	16	Pink
Dark Star	41	34	136	68	185	18	Pink
David Bowie	20	34	84	57	237	16	White
Delight	32	33	91	67	221	20	White
Halley's Comet	32	34	105	91	217	19	Pink
LA Woman*	6	35	90	65	242	17	Red
Lake Atitlan	29	34	69	59	185	19	White
Makisupa	49	34	71	59	181	19	Red
Natural Mystic	27	34	88	76	318	16	Pink
Physical Graffiti	53	34	80	60	224	18	Pink
Pink	17	34	74	51	102	18	Pink
Purple Haze	38	33	73	69	234	18	Red
Rixford*	9	40	142	66	170	19	Purple
RGHP	8	34	123	55	70	18	Red
Seoul Kitchen	29	33	62	58	138	16	White
Tissue Culture	17	38	73	56	129	16	Red
Thompson	17	36	89	58	242	17	White
UVI	14	34	80	80	224	18	Pink
Voodoo Child	25	39	70	48	113	19	Red
Yellow	12	52	70	41	101	22	White
Zamorano	24	49	68	54	122	16	Red

*Requires cross pollination

Bold indicates recommended varieties



Figure 1. A collection of pitaya fruit harvested the second year.