# Wet Season Tomato Varieties for St. Croix, U.S. Virgin Islands[1]

*Christopher Ramcharan and John M. Gerber*[2]

ABSTRACT

**Fifty tomato varieties from varying sources were tested on a Fredensborg clay from September 1978 to March 1979 for yield and pest problems during the rainy season in St. Croix. Plants were grown on banks but were not staked or pruned. Varieties from the University of Hawaii were the earliest to flower and fruit. Stakeless, Royal Ace, Cal Ace VF, and Sunray were the latest maturing varieties in this trial. Fruits were harvested in the ripe and turning stage, culled and weighed in the fields. There were a total of 12 harvests starting January 16 and terminating March 2, 1979. The varieties N-5, N-69, BWN-21, N-52 (from Univ. of Hawaii) and Prime Beefsteak, Red Glow, Betterboy H, Big Set H, Chico III, Manapal and Homestead were among the best. These all yielded well over an estimated 25,000 lb/acre with N-5 just over 36,000 lb/acre of marketable fruits. Traditional types such as Indian River, Floradel, Marglobe, and Tropic were in the 15 to 20,000 lb/acre range. Major problems were infestation with the tomato fruit worm and ground rot of fruits. Future trials should include a better insect control program and some type of mulching.**

## INTRODUCTION

The tomato ranks high in the list of fresh vegetables consumed in St. Croix. However, almost all are imported. Because of the low and uneven rainfall pattern in St. Croix, most plantings are done during the latter part of the year to coincide with the rains. Insect and diseases are a major problem when growing tomatoes during the rainy season. Selection of tomato varieties that give high yields of good quality fruit during the wet season has always been a major task of researchers at the CVI Agricultural Experiment Station. A variety trial consisting of 50 varieties of tomato from varying sources (table I) was initiated in September 1978.

## MATERIALS AND METHODS

Seeds were sown in seedling Styrofoam trays with (1½ in cells) using a prepared peat/vermiculite mix September 21, 1978.

Plots were banked October 9, with 1 ft high ridges 3 ¾ ft apart. Three pounds of 10-10-10 fertilizer per 30 ft of row was banded October 16. Preplant herbicide treatments consisted of Round-up[3] (1 qt/acre) applied

[1] Manuscript submitted to Editorial Board August 19, 1980.

[2] Associate Horticulturist and Horticulturist, respectively, Agricultural Experiment Station, College of the Virgin Islands, Kingshill, St. Croix, USVI.

[3] Trade names in this publication are used only to provide specific information. Mention of a trade name does not constitute a warranty of equipment or materials by the Agricultural Experiment Station of the University of Puerto Rico, nor is this mention a statement of preference over other equipment or materials.

TABLE 1.—*Tomato varieties and source*

| Variety | Source |
|---|---|
| Floramerica | Reuter |
| Better Boy | " |
| Atkinson | " |
| Pelican | " |
| Gulf State Market | " |
| Break-O-Day | " |
| Creole | " |
| Marion | " |
| Improved Summertime | Texas A & M |
| Patriot | U. S. V.L.-S.C. |
| Hybrid Ace VFN | Ball |
| Cal Ace VF | Ball |
| Auburn 76 FMN | Unknown |
| Flora-Dade | Peto |
| Tamiami | Peto |
| N-5 | U. Hawaii |
| N-11 | " |
| N-52 | " |
| N-63 | " |
| N-65 | " |
| N-69 | " |
| Anahu | " |
| BWN-21 | Local Store—Ferry Morse |
| Stone | " |
| Royal Ace VF | " |
| Rutgers | " |
| Sunray | " |
| Red Cherry | " |
| Beefsteak | " |
| Prime Beefsteak VF | " |
| Homestead | Keystone |
| Super A | " |
| Manalucie | " |
| Floralou | " |
| Floradel | " |
| Homestead 24 | " |
| Indian River | " |
| Walter | " |
| Manapal | " |
| Chico III | " |
| Heinz 1370 | Twilley |
| Royal Chico | " |
| Red Glow | " |
| Big Set H | " |
| Stakeless | " |
| Traveler 76 | " |
| Tropic | " |
| Homestead 500 | " |
| Heinz 1350 | " |
| Marglobe | " |

November 3, followed by Paraquat (2 qt/acre), Dacthal (12 lb/acre) and Enide (12 lb/acre) November 13. Two 30-ft rows of each variety were planted in a random design. A plant spacing of 2 ft was used on the entire area planted, of approximately ⅓ acre. Crop protective measures consisted of applying insecticide-fungicide mix at weekly intervals beginning immediately after planting. Diazinon 2EC (1 qt/acre) and Dithane M-45 (2 lb/acre) were alternated with Sevin (4 lb/acre) and Kocide 101 (3 lb/acre). Sprays were applied from a 20-gal tank with a boom spray at 75 lb/in$^2$. On December 6, January 9, and January 24, Thuricide WP (1 lb/acre) was included in the regular spray schedule because of pin worm outbreak (*Keiferia lycopersicella*). On December 12, Dacthal (12 lb/acre) was used again for weed control, and a single hand weeding was done January 9, 1979.

## RESULTS AND DISCUSSION

There were 12 pickings from January 16 to March 2, 1979. Data taken from each plot included the total number of fruits, total weight, weight of marketable fruits, and diameter of 10 selected fruits.

The Hawaiian varieties were among the earliest to flower and fruit, with flowering occurring as early as the third week in December.

Latest maturing varieties were Stakeless, Royal Ace, Cal Ace VF and Sunray with intermediate types being Walter, Manalucie, Tropic, Homestead 24, Patriot, Floralou and Floradel.

The highest yielding varieties were the Hawaiian types, Prime Beefsteak, Red Glow, Betterboy hybrid, Big Set hybrid, Manapal, Homestead and Chico II (table 2). Prime Beefsteak had the largest fruit (8 oz); N-5, N-69, Red Glow, and Big Set averaged 5 oz and Betterboy hybrid, 6 oz. Chico III, a processing type was the smallest, weighing an average of 2 oz/fruit.

The two major problems were fruit worms (*Heliothis zea*) and ground rot (*Rhizoctonia solani*). Fruit worm infestation was most severe on N-5, Prime Beefsteak, N-69, Chico III and Big Set H. A better spray program or more effective insecticides must be employed on these varieties. On Red Glow, BWN-21, Manapal, Betterboy hybrid, N-52 and Homestead, ground rot was the number one cause for spoiled fruits. Although the marketable fruit from the latter types was relatively high (30–60%) this percentage could well be increased with better crop protective measures.

The Red Cherry variety was the only type not affected by fruit worm or ground rot. Ripened fruits however, tended to split easily. Super A seemed to be the most tolerant of fruit worm, since only superficial damage was observed.

In taste tests Red Glow, Manapal and Betterboy hybrid were the sweetest of high yielding varieties. These three were also firm but juicy.

TABLE 2.—*Yield data and pest problems of 50 varieties of tomato*

| Variety | Plot (60 ft.) Yield Mktb. fruit | Estimated Yield/ Acre Mktb. fruit | Mktb. Fruit of Total Yield | Fruit Wt. | Major problems | Other |
|---|---|---|---|---|---|---|
| | *lb* | *lb/acre* | *%* | *oz* | | |
| Beefsteak | 80.99 | 15,150 | 57 | 7.5 | GR,MSF,FW | |
| Prime Beefsteak VF | 159.18 | 30,937 | 71 | 7.8 | FW,MSF,GR | |
| Homestead 24 | 121.66 | 23,664 | 78 | 3.7 | GR,FW | |
| Super A | 122.22 | 23,723 | 78 | 2.6 | FW,GR,BE | Worm damage mainly superficial |
| Betterboy | 150.55 | 29,265 | 68 | 5.4 | GR,FW,BE | Some growth crack |
| Floramerica H | 106.73 | 20,806 | 62 | 6.2 | GR,FW | Chlorosis, leaf miner |
| Pelican | 108.66 | 21,000 | 61 | 2.2 | GR,FW,BE | Growth cracks |
| Atkinson | 114.80 | 22,362 | 68 | 3.0 | FW,GR,BE | Leaf miner |
| Break-O-Day | 91.91 | 17,870 | 68 | 2.2 | GR,FW | |
| Gulf State Market | 108.52 | 21,000 | 61 | 4.0 | GR,FW | |
| Stakeless | 88.03 | 17,117 | 80 | 5.1 | FW,MSF | Compact foliage, disfigured fruits, late bearer |
| Big Set H | 148.85 | 28,973 | 66 | 4.8 | FW,GR | Stem end rot, circular cracks Blossom tear, chlorosis |
| Homestead 500 | 96.91 | 18,861 | 68 | 4.3 | FW,GR | Stem end rot, mis-shapen fruits |
| Heinz 1350 | 82.88 | 16,139 | 68 | 3.8 | GR,BE | Little worm damage |
| Heinz 1370 | 96.98 | 18,862 | 69 | 4.2 | GW,GR,BE | |
| Royal Ace VF | 88.73 | 17,306 | 77 | 5.0 | GR,FW | |
| Cal Ace VF | 88.57 | 17,228 | 58 | 6.0 | GR,BE | Late bearer |
| Hyb. Ace VFN | 115.68 | 22,478 | 62 | 5.8 | GR,FW,BE | Blossom tear mis-shapen |
| Stone | 66.85 | 13,028 | 60 | 3.5 | GR | Growth cracks, little worm damage |
| Auburn 76 FMN | 115.54 | 22,362 | 72 | 3.8 | FW,GR | |
| Floradade | 113.36 | 21,972 | 65 | 5.1 | GR,FW,BE | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Tamiami | 113.40 | 21,972 | 70 | 4.2 | FW,GR | Stem end rot |
| Floradel | 90.22 | 17,543 | 68 | 4.6 | GR,FW,BE | |
| N-5 | 186.87 | 36,362 | 77 | 4.8 | FW,GR | Growth cracks |
| N-69 | 165.59 | 32,279 | 67 | 4.8 | FW,GR,BE | Mis-shapen fruits |
| N-52 | 133.09 | 25,861 | 70 | 4.2 | GR,FW,BE | |
| Anahu | 129.73 | 24,889 | 67 | 3.4 | FW,GR | |
| BWN-21 | 131.02 | 25,472 | 76 | 2.7 | GR,FW | Growth cracks |
| N-65 | 103.28 | 20,020 | 59 | 3.8 | GR,FW,BE | Circular cracks |
| N-63 | 98.98 | 19,250 | 77 | 3.2 | GR,FW | |
| Red Glow | 155.33 | 30,140 | 77 | 5.0 | GR,FW | Some growth cracks, but good uniform fruits |
| Chico III | 136.56 | 25,472 | 85 | 1.8 | FW,GR,BE | |
| Royal Chico | 76.29 | 14,778 | 77 | 2.1 | FW,GR | |
| Manapal | 130.60 | 25,473 | 79 | 4.0 | GR,FW | |
| Manalucie | 72.68 | 14,195 | 51 | 5.3 | GR,FW | Mis-shapen fruits |
| Marglobe | 92.63 | 18,083 | 77 | 4.8 | GR,FW | Mis-shapen fruits, growth cracks |
| Tropic | 98.86 | 19,250 | 63 | 5.3 | FW,GR | |
| Indian River | 90.66 | 17,695 | 69 | 3.8 | FW,GR,BE | |
| Walter | 87.19 | 16,917 | 65 | 3.7 | FW,GR | |
| Floralou | 75.30 | 14,584 | 56 | 3.5 | FW,GR | |
| Red Cherry | 116.26 | 22,556 | 87 | 6.4 | | Consistent bearer, fruit split of ripened fruits |
| Traveller 76 | 93.72 | 18,556 | 87 | 4.3 | FW,GR | |
| Marion | 72.28 | 14,000 | 66 | 4.2 | GR,FW | |
| Creole | 87.59 | 17,034 | 59 | 4.0 | GR,FW,BE | |
| Homestead | 136.12 | 26,486 | 63 | 5.1 | GR,FW | |
| Imp. Summertime | 86.66 | 16,917 | 62 | 3.5 | GR,FW | Growth cracks, mis-shapen fruits |
| Patriot | 100.21 | 19,445 | 75 | 3.4 | GR,FW,BE | Late bearer |
| Sunray | 51.05 | 10,014 | 52 | 5.9 | GR,FW,BE | Late bearer |
| Rutgers | 66.17 | 12,834 | 55 | 4.2 | GR,FW,BE | |
| N-11 | 94.98 | 18,473 | 53 | 3.7 | GR,FW | |

[1] GR = Ground Rot; FW = Fruit Worm; BE = Buckeye Rot; MSF = Mis-shapen fruit.

In the 20 to 25,000 lb/acre group Pelican, Atkinson, Auburn 76 and N-65 were very sweet. N-69, Prime Beefsteak, Big Set, and N-5, the highest yielding variety, were slightly sweet.

The variety Stakeless, although it had little ground rot, was late bearing and had many mis-shapen fruits. Of the other late bearers Cal Ace VF had the largest fruits but had only 58% marketable fruit because of ground rot.

Marglobe and Tropic, the traditional type tomatoes recommended for St. Croix, were both in the 15 to 20,000 lb/acre yield range and fruit weight averaged 5 oz. While both were slightly sweet, Marglobe appeared to be firmer. Both were affected by fruit worms and ground rot. Marglobe also tended to produce mis-shapen and cracked fruits.

Overall, the Hawaiian types were the best yielding group of tomatoes in this trial. Varieties that were firm, sweet and had a high marketable yield were Red Glow, Betterboy hybrid, Prime Beefsteak, Big Set hybrid, N-52 and BWN-21. Of the two processing types Chico III was the better. Since ground rot was a major limiting factor with the higher yielding varieties it would be well worth trying these tomatoes in the dry period of the year, with irrigation. They would also certainly do better during the wet months, if staking and/or mulching were employed.


## RESUMEN

Cincuenta variedades de tomate de diferentes procedencias se incluyeron en una prueba en Santa Cruz, Islas Vírgenes. Las plantas se sembraron en bancales en una arcilla Fredensborg, para observar su comportamiento, rendimiento y la incidencia de insectos y enfermedades durante la época lluviosa. Las plantas no se estaquearon ni podaron.

Se efectuaron 12 recolecciones entre enero 16 de 1978 y marzo 2 de 1979, recolectándose en cada ocasión las frutas maduras y pintonas.

Las variedades de la Universidad de Hawaii fueron las más precoces, y las Stakeless, Royal Ace, Cal Ace VF y Sunray las más tardías.

Las variedades N-5, N-69, BWN-21 N-52 (de la Universidad de Hawaii) y las Prime Beefsteak, Red Glow, Betterboy H, Big Set H, Chico III, Manapal y Homestead fueron las mejores. Todas produjeron rendimientos estimados de más de 25,000 libras por acre. La N-5 produjo sobre 36,000 libras de tomates comerciales.

Las variedades tradicionales, tales como Indian River, Floradel, Marglobe y Tropic produjeron entre 15 y 20,000 libras por acre.

Los problemas principales fueron los gusanos de las frutas y la pudrición de las que tocaban la tierra.

En pruebas futuras se deberia incluir un control más rígido de los insectos y algún material que cubra el terreno para proteger las frutas.