

## **Ethnic Vegetable Production Trials on a Plasticulture System for the Development of an Ethnic Food Market in Southern Maryland**

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### **Introduction**

In 2000 a preliminary ethnic vegetable study was conducted at the University of Maryland Research and Education Center (UMREC) in Upper Marlboro, Maryland to examine the five West African vegetables: hibiscus (leaves), sweetpotato (leaves), edible amaranth, African eggplant, and an African pepper variety. This preliminary study was also featured as part of the Upper Marlboro UMREC Farm Field Day on July 26, 2000, which stimulated interest among the farm community, and resulted in a grant awarded to a three-member investigative team. The grant entitled “Developing an Ethnic Food Market in Southern Maryland” included the following three major areas of concentration: 1) The evaluation of ethnic vegetable markets and their economic development, led by researcher Stephan Tubene, Coordinator, University of Maryland Small Farm Institute; 2) The development of community awareness of ethnic vegetable produce through dietetic workshops and cooking demonstrations, led by researcher Constance Pergerson, Extension Educator, University of Maryland; and 3) The examination of commercial ethnic vegetable production techniques, led by researcher R. David Myers, Extension Educator, University of Maryland.

The ethnic vegetable study planted in 2001 continued focus on the five African vegetables stated and expanded to include Caribbean, Oriental, India, and South American vegetables and herbs for comparison. An examination of yields and the development of production practices was the focus of the study on a plasticulture intensive management system. However, the dietetic, marketing, and economic assessment of the vegetables will ultimately serve as the springboard for developing a regional alternative enterprise for Southern Maryland farmers. The Maryland ethnic vegetable team plans to develop a series of extension fact sheets for the purpose of educating growers for the successful transition into production and marketing of these new cropping opportunities.

Of mentionable note, a similar ethnic vegetable study was conducted in 2000 by researcher William Sciarappa, Agricultural Agent, Rutgers University, and reported in the 2000 Mid-Atlantic Vegetable Workers Conference Proceedings. The previously reported results were very collaborative with this trials finding.

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## Materials and Methods

The project was designed as a randomized complete block, with four replications for each of the ethnic vegetables or herbs grown. The plot dimension were 15 ft wide by 20 ft long with three 6' high by 30' wide raised plasticulture beds on 5' centers. The transplants or directly seeded crop was spaced either 36'' or 12'' by 12'' in the row as indicted in Table 1., with either 2,904 ppa or 17,424 ppa, respectively. The transplants were contract grown with seeds from Johnny's Selected Seeds, or from sources within the local ethnic communities.

The research trial was conducted in 2000 and 2001 at the University of Maryland Research and Education Center in Upper Marlboro, Maryland, on a Monmouth fine sandy loam soil. Soil tests revealed optimum levels of phosphorus and potassium for both of the sites. A complete starter fertilizer was applied during bed making, and additional nitrogen was supplemented through the trickle irrigation system as required. Insecticide and fungicide treatments were made as required if labels existed for the individual crops.

The trials were planted on May 12, 2000 and May 9, 2001 with the following exceptions: The African eggplant, African/Jamaican hot pepper var. *Scotch Bonnet*, and *Solanum gilo* "Jamaican Bitter Balls" were planted on May 24, 2001, and the sweet potato var. *Red Hayman* was planted on May 24, 2001. The tomatillo plots required staking and twine weaving for standability. All other crop species were free standing.

## Results

The plots were harvested, utilizing random destructive plant sampling, or whole plot for yield determinations. Some crops were harvested multiple times whereas others were harvested once over. Mean weights of the marketable plant portion were determined for each crop species and/or variety, and reported in Table 1. The project experienced cooler and wetter than normal summers for both years delaying the fruit harvest, whereas the vegetative growth and quality were enhanced. On August 4, 2000 the following ethnic vegetables were harvested: *Solanum gilo*, "Jamaican Bitter Balls"; green amaranth; edible hibiscus, sweet potato var. *Red Hayman*; and Pepper vars. *Scotch Bonnet*, and *Numex*. The smooth leaf spinach var. *Denali* was harvested June 6, 2001. On July 3, 2001 the following vegetables and herbs were harvested: Oriental cucumber var. *Suyo Long*; sweet basil var. *Genovese*; cilantro var. *Jantor*; and chervil var. *Brussels*. On July 6, 2001 the following vegetables and herbs were harvested: red amaranth; *Solanum gilo*; holy basil, *Kaprao*, and *Osmin Purple*. On July 20, 2001 the following vegetables were harvested: Oriental cucumber var. *Suyo Long*; *Solanum gilo*, "Jamaican Bitter Balls"; tomatillo vars. *Toma Verde*, and *Purple*; Leeks var. *Upton*; pepper var. *Pimento Elite*; and eggplant vars. *Nadia*, and *Zebra*. On July 31, 2001 the following vegetables were harvested: eggplant var. *Kermi*; red amaranth; edible hibiscus, leaves; sweet potato var. *Red Hayman*; and Pepper var. *Scotch Bonnet*. On August 24, 2001 the following vegetables were harvested: Pepper var. *Numex*, "green habanera", "red habanera", and "orange habanera".

## Conclusions

The ethnic vegetables in this two-year study yielded consistently with sufficient quality and quantity to convince growers of their production potential in a plasticulture system. There are potentially hundreds of specialty vegetable and herb species and/or varieties that have market development potential in our ethnically diverse population centers, which require further research and educational programs. Promotion of specialty vegetables and herbs will help to mainstream them into our marketplace, thereby, enriching our diets and lives.

**Table 1. Ethnic Vegetable Yields 2000 & 2001  
Harvested Fruit or Leaf**

<b>Vegetable Crop Species/Variety</b>	<b>Population (Plants/acre ppa) Spacing</b>	<b>Average Yield Harvested Portion (Pounds/plant)</b>	<b>Average Yield Harvested Portion (Estimated Pounds/acre)</b>	<b>Average Yield Harvested Portion (Estimated Tons/acre)</b>
Hibiscus, Edible, African	2,904 ppa 5' X 36"	Leaves 9.188	Leaves 26,682	Leaves 13.34
Amaranth, Edible Green "Jamaican Calaloo"	2,904 ppa 5' X 36"	Leaves 7.625	Leaves 22,143	Leaves 11.07
Amaranth, Edible Red "Jamaican Calaloo"	2,904 ppa 5' X 36"	Leaves 5.750	Leaves 16,698	Leaves 8.35
Sweet Pepper, Green/Red Bell "King Arthur"	2,904 ppa 5' X 36"	Fruit 6.750	Fruit 19,602	Fruit 9.80
Sweet Pepper, Red Pimento "Pimento Elite"	2,904 ppa 5' X 36"	Fruit 1.938	Fruit 5,628	Fruit 2.81
Hot Pepper, Cayenne "Mesilla"	2,904 ppa 5' X 36"	Fruit 5.250	Fruit 15,246	Fruit 7.62
Hot Pepper, Ornamental "Numex"	2,904 ppa 5' X 36"	Fruit 3.250	Fruit 9,438	Fruit 4.72
Hot Pepper, African/Jamaican "Dutch Bonnet"	2,904 ppa 5' X 36"	Fruit 3.125	Fruit 9,075	Fruit 4.54
Hot Pepper, Green Habanera	2,904 ppa 5' X 36"	Fruit 1.000	Fruit 2,904	Fruit 1.45
Hot Pepper, Red Habanera	2,904 ppa 5' X 36"	Fruit 2.725	Fruit 7,913	Fruit 3.96
Hot Pepper, Orange Habanera	2,904 ppa 5' X 36"	Fruit 1.938	Fruit 5,628	Fruit 2.81
Solanum Gilo "Jamaican Bitter Balls"	2,904 ppa 5' X 36"	Leaves & Fruit 4.031	Leaves & Fruit 11,706	Leaves & Fruit 5.85
Sweet Potato "Red Hayman"	2,904 ppa 5' X 36"	Leaves&Petioles 13.038	Leaves&Petioles 37,862	Leaves&Petioles 18.93
Cucumber, Asian "Suyo Long"	2,904 ppa 5' X 36"	Fruit 14.80	Fruit 42,979	Fruit 21.49
Tomatillo, Green "Toma Verde"	2,904 ppa 5' X 36"	Fruit 8.388	Fruit 24,359	Fruit 12.18
Tomatillo, Purple "Purple"	2,904 ppa 5' X 36"	Fruit 11.100	Fruit 32,234	Fruit 16.12

**Table 1. (Cont.) Ethnic Vegetable Yields 2000 & 2001  
Harvested Fruit or Leaf**

<b>Vegetable Crop Species/Variety</b>	<b>Population (Plants/acre ppa) Spacing</b>	<b>Average Yield Harvested Portion (Pounds/plant)</b>	<b>Average Yield Harvested Portion (Estimated Pounds/acre)</b>	<b>Average Yield Harvested Portion (Estimated Tons/acre)</b>
Eggplant, Black Oblong "Nadia"	2,904 ppa 5' X 36"	Fruit 7.988	Fruit 23,197	Fruit 11.60
Eggplant, Purple Striped Oblong "Zebra"	2,904 ppa 5' X 36"	Fruit 3.413	Fruit 9,911	Fruit 4.96
Eggplant, Green Striped Round "Kermit"	2,904 ppa 5' X 36"	Fruit 7.313	Fruit 21,237	Fruit 10.62
Leek "Upton"	17,424 ppa 5' X 12" X 12"	Leaves & Bulb 0.360	Leaves & Bulb 6,273	Leaves & Bulb 3.14
Spinach, Smooth Leaf "Denali"	17, 424 ppa 5' X 12" X 12"	Leaves 0.280	Leaves 4,879	Leaves 2.44
Cilantro "Jantor"	2,904 ppa 5' X 36"	Leaves 1.875	Leaves 5,445	Leaves 2.72
Chervil "Brussels"	2,904 ppa 5' X 36"	Leaves 0.500	Leaves 1,452	Leaves 0.73
Sweet Basil "Genovese"	2,904 ppa 5' X 36"	Leaves 3.000	Leaves 8,712	Leaves 4.36
Holy Basil, Green "Kaprao" Thailand	2,904 ppa 5' X 36"	Leaves 0.700	Leaves 2,033	Leaves 1.02
Basil, Purple "Osmin Purple"	2,904 ppa 5' X 36"	Leaves 0.233	Leaves 677	Leaves 0.34