Profitability of Ethnic Vegetable Varieties for Sale in Urban Niche Markets

FNE02-417

- Final Report -
2002 SARE Northeast Region Farmer/Grower Grant

Project Leader: Haroun Hallack
Redbud Farm
942 Tablers Station Road
Inwood, WV 25428
Phone: 304-229-7222
Fax: 304-229-2709
Email: Redbudfarm@earthlink.net

I. TITLE: Profitability of Ethnic Vegetable Varieties for Sale in Urban Niche Markets

II. Project Goals.

This project was conducted to determine the profitability of growing several West African vegetable varieties for niche markets in the Washington D.C. area. The research was intended to explore potential niche crops that would expand markets for small farms located near major urban areas with significant African immigrant populations. The trials measured insect and disease susceptibility and plant productivity, in order to determine which varieties are suitable for growing under organic standards in our area. In addition, sales of the ethnic varieties in urban markets were tracked, and a profitability study was conducted.

III. Updated Farm Information.

Our farming operation has not changed significantly since submitting our SARE grant proposal. Redbud Farm is a certified organic 40-acre farm located about 2 hours west of Washington, D.C. We currently farm about 11 acres under intensive, diversified vegetable and small fruit production, 20 acres in hardwood forest, and 9 acres in hay. A variety of vegetables, 10-15 varieties of tomatoes, raspberries, and African specialty vegetables are grown. We also have a 40 member CSA in the Washington D.C. area.

IV. Cooperators.

Mr. Wahid Hallack, our cooperator in Freetown, Sierra Leone, supplied seed for the project and provided advice on crop growing requirements. Ms. Mary-Beth Bennet (Bekeley County Agricultural Extension Service) served as Technical Advisor for the project.

V. Project Methods.

Plant propagation.

The following African vegetable varieties were tested: 1-) habenero peppers, 2-) jakato (African eggplant), 3-) amaranth greens, 4-) sour sour greens, 5-) jute greens, 6-) sweet potatoes. The habenero peppers and jakato were started in the greenhouse February 27, 2002 and watered daily until transplanting. NOTE: The jakato suffered from flea beetle attack in the greenhouse at a very early stage and was not able to recover. Thus, the jakato crop was a failure, and none was available to plant into the field at the appropriate time.

Field Sites.

Two experimental locations (A & B) separated by woodlot were used for the project. The soil was plowed and disked before planting. Ten rows, 3 ft wide by 200 ft long, were established at each field location (A and B). Rows were separated by 3 ft wide alleys that were cultivated by roto-tilling periodically to kill weeds. Two rows per each vegetable variety were established at each location.

Planting & Production.

Black plastic was laid with a tractor-driven plastic layer in the rows to be used for habenero peppers and sour sour greens. The habenero plugs were transplanted in the field June 5 using a tractor-driven transplanter that digs holes in the plastic. The sweet potato slips were transplanted directly in the soil by tractor-driven transplanter on June 11. The transplanter was used to dig holes for the sour sour, and then the seed was placed in the holes and covered by hand on June 12. The amaranth and jute were direct seeded in rows using a push seeder on June 12. All plants or seeds were planted into two rows spaced 3 ft. apart within the bed. Peppers, sour sour, and sweet potatoes were planted at 2 ft spacing within the rows. All other seeds were sown at a rate of ~ 25 seeds per ft. As noted earlier, no jakato was available for planting due to crop failure in the greenhouse. Watering was by natural rainfall, and no fertilizers or insecticides were applied during the whole season. A summary of production practices is in Table 1.

Sampling & Data Collection.

Each variety was monitored visually for insects and disease problems one time per month during the entire growing season (originally, we had planned to sample 2 times per month, but we had to reduce the sampling schedule because of labor constraints). Ten plants per row were randomly selected while walking down the row. Each plant was examined, and the number of leaves per plant with any type of insect damage was recorded on a data sheet. The number of leaves per plant with disease damage was also recorded. We then did statistical analyses using SAS software (Version 9.0) and compared insect and disease damage by vegetable variety.

We kept track of the number of labor hours per person that was used for each crop for weeding, picking, cutting for harvest, and washing or preparing for sales. We also estimated the cost for plastic and tractor diesel used in preparing the beds for each crop, so that all production costs were taken into account. Crops were harvested when they reached maturity, and the yields were measured and recorded. Peppers were hand picked and sold without washing. Sour sour, amaranth, and jute were cut in the field and washed before selling. The plants were allowed to continue growth (cut & come again technique) and were harvested on a weekly basis during peak growth. The sweet potato leaves

were unsallable due to unacceptable levels of insect damage. Instead, the tubers were dug and washed and then sold as roots.

VI. Results.

The results for insect damage (loss) and incidence are reported in Figures 1 – 2. The jute and sweet potato leaves suffered the most insect damage (Fig. 1). Jute and sweet potato leaves had more insect damage per plant than the other 4 varieties tested. Nonetheless, the damage level of ~ 3 leaves per plant was not significant enough to reduce salability of the crop. However, the sweet potato vines had difficulty establishing, probably due to drought, so there was very little leaf material available for sale. Both sour sour types (green and red), the amaranth, and the habenero peppers had very little insect damage (Fig. 1), with 1 or < leaves per plant showing damage during the season. This result was very exciting and encouraging, because no insecticides were used, indicating that these varieties might have some resistance to insects in our territory.

The number of insect pests seen on the plants (by visual sampling) is shown in Figure 2. The main damage-causing insect pests observed were hoppers (Cicadellidae), flea beetles, and Japanese beetles. There were also occasional cucumber beetles and other beetles in the family Chrysomellidae. Where damage was seen, it seemed to be primarily due to flea beetle or Japanese beetle. Habenero peppers, sour sour, and amaranth had the least amount of pests on them during the whole season (Fig. 2), with < 0.25 insects per plant on average. Jute had a similarly low number of pests, ~ 0.5 per plant. The green sour sour had more pests than the red variety of sour sour, but the pest pressure was still very low (~ 1 pest per plant). The sweet potatoes had the highest pest incidence of all varieties, with ~ 1.5 pests per plant.

In terms of disease, we found no disease pressure all season long on all crops. If there was any disease, it was never evident on the leaves that we examined visually. This was surprising and was an excellent finding, indicating that the African varieties are suitable for organic production without encountering disease problems here in our climate.

A summary of the cost-benefit analysis is presented in Table 2. Since land space and soil building practices were the same for all crops, these items were not addressed in the cost-benefit analysis. The only crop we lost money on was the jakato (African eggplant), which never made it out of the seedling phase of production. We would definitely not recommend growing this crop in areas that have high flea beetle pressure! All the other crops ended up being profitable, but to different extents. The habenero peppers had the greatest yield (845 lbs) and were the most cost efficient crop to produce, netting a total of $1837.50 after all input expenses were factored out. This was probably due to both their high resistance to insect pests and their low labor requirements to pick and package. Once they were planted into the black plastic, they required no further attention until harvesting. The green sour sour type was the next best crop in terms of cost efficiency, yielding 280 pounds ($336.50 net sales). Interestingly,

the green sour sour was more productive than the red variety, which only yielded 60 pounds all season. Since the red and green varieties had virtually the same pest damage levels (Fig. 1), we would recommend that farmers grow only the green variety, which is highly productive. Overall, the habenero peppers and greens for cutting were excellent vegetable varieties for the niche markets. The sweet potatoes did net $89.25 over the season, but we were never able to sell the leaf portion as intended, due to problems with establishment in the beds. Since the tuber portion was salable, we did not loose money on this crop. However, we would not recommend it for sale in niche markets, when valuable land space could be devoted to the other greens or peppers.

VII. Specific Conditions.

The 2002 season was considered a drought year in our region, and this may have impacted the tests we ran. But the crops we tested are all from a tropical climate (Africa) and grown under hot, dry conditions, so we are not certain if the drought conditions were a significant factor for the plants we tried. Our region (med-Atlantic) tends to be typically very humid in the summer months, leading to disease outbreak. However, we saw no disease problems on the varieties we tested.

IIX. Economic Findings.

Our economic findings were discussed earlier (section V). However, we did not factor in the cost of the soil building practices, land use, or plowing and disking. These operations involved labor, tractor use, and diesel. In addition, the project involved a significant amount of labor for sampling and data collection. We believe that if we were to grow the African crops solely for profit, they would provide a good addition to our yearly earnings (that is, if we didn't have to pay a worker and myself to do the data collection and sampling that were involved in the experimentation).

IX. Ideas for Future Steps.

The results from this project lead us to believe that more African vegetable varieties should be tested in the future. The sales in the niche markets in Washington, DC were steady, and we were not able to meet the demand for the products. The next step would be to try additional crops and determine if they are compatible to our climate type.

X. Continued Practices.

We plan to continue growing the greens (except for red sour sour) and the habenero peppers in the same manner as was investigated here at our farm.

We plan to put these crops into full production next year, to see if we can sell a larger quantity. We will not grow the jakato or the sweet potatoes, because they were too problematic.

XI. Outreach.

Two farm tours highlighting our research on African vegetable varieties were conducted during the season. Tour participants included local farmers, Sustainable Agriculture students from Shepherd College and the University of Maryland, our Extension Agent, and a representative from our local Soil Conservation Office. We had a very favorable response from tour participants, who planned to further disseminate the information at their institutions or among fellow farmers.

Our farm research project was highlighted this year in a Soil Conservation presentation (February 2003) on minority farmers. In addition, our local Extension Agent has agreed to publish an article detailing our research in the monthly Extension Newsletter.

We prepared a flyer (enclosed) describing our research results, to be disseminated to local growers. We have made copies of the flyer available to both our local Soil Conservation Service and Extension offices and to the Sustainable Agriculture program at a local college (Shepherd College).

XII. Prepared by Haroun Hallack, Redbud Farm, 2/20/03.

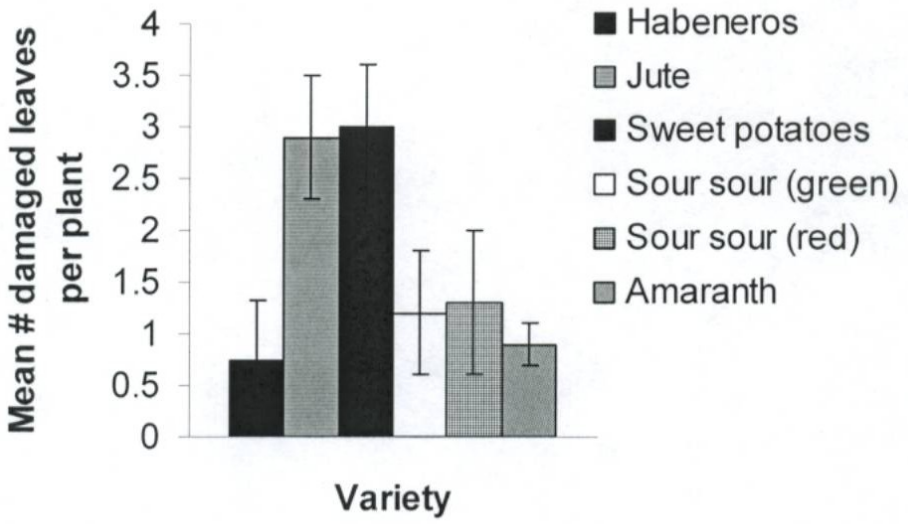

Figure 1. Insect damage to ethnic vegetable varieties grown in 2002

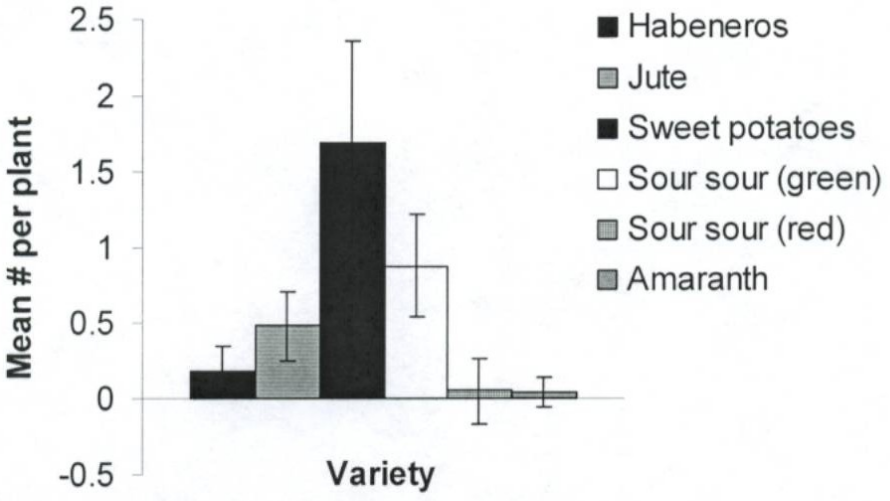

Figure 2. Insect pests on ethnic vegetable varieties grown in 2002: visual counts

Table 1. Summary of Production Methods used at Redbud Farm by African Vegetable Variety.

Crop	Production Methods*			
	Transplanting/Seeding	*Irrigation*	*Fertilization*	*Weed Control*
Habenero Peppers	Mechanical transplanter	none	none	Black plastic mulch
Jute	Push seeder	none	none	Hand cultivation
Sweet Potatoes	Mechanical transplanter	none	none	Hand cultivation
Sour Sour (green)	Mechanical transplanter dug holes; direct seeded into holes	none	none	Black plastic mulch
Sour Sour (red)	Mechanical transplanter dug holes; direct seeded into holes	none	none	Black plastic mulch
Amaranth	Push seeder	none	none	Hand cultivation

* Cover cropping was used to build soil fertility; all beds plowed and disked before planting.

Table 2. Cost-benefit Analysis for African Vegetables Produced at Redbud Farm in 2002.

Crop	Production Inputs*		Harvesting & Preparing	Total	Yield	Price	Total	Net Profit
	Labor	*Materials*	*Labor*	Expenses	(lbs)	($) per lb	Sales ($)	($)
Habenero	Transplanting 4 h @ $7 = 14	Black	Picking 22 h @ $7 = 154		845	2.5	2112.5	
Peppers	Transplanting 2 h @ $10 = 20	plastic $10	Picking 11 h @ $10 = 77					
Subtotals:	34	10	231	275			2112.5	**1837.5**
Jute	Direct seeding 3 h @ $7 = 21		Washing & boxing 3 h @ $10 = 30		200	1.5	300	
	Weeding 4 h @ $7 = 28	0	Cutting 3 h @ $10 = 30					
Subtotals:	49	0	60	109			300	**191**
Sweet	Transplanting 0.5 h @ $10 = 5		Digging 2 h @ $10 = 20		125	1.25	156.25	**156.25**
Potatoes	Transplanting 1 h @ $7 = 7		Digging 2 h @ $7 = 14					
	Weeding 3 h @ $7 = 21	0						
Subtotals:	33	0	34	67			156.25	**89.25**
Sour Sour	Transplanting 1 h @ $10 = 10	Black	Washing & boxing 3 h @ $10 = 30		280	1.5	420	
(green)	Weeding 0.5 h @ $7 = 3.5	plastic $10	Cutting 3 h @ $10 = 30					
Subtotals:	13.5	10	60	83.5			420	**336.5**
Sour Sour	Transplanting 1 h @ $10 = 10	Black	Washing & boxing 1 h @ $10 = 10		60	1.5	90	
(red)	Weeding 0.5 h @ $7 = 3.5	plastic $10	Cutting 1 h @ $10 = 10					
Subtotals:	13.5	10	20	43.5			90	**46.5**
Amaranth	Direct seeding 1 h @ $7 = 7		Washing & boxing 1 h @ $10 = 10	0	125	1.5	187.5	
	Weeding 1 h @ $7 = 7	0	Cutting 1 h @ $10 = 10					
Subtotals:	14	0	20				187.5	**187.5**

* Land use, irrigation, fertilizer inputs were equal for each variety and were not considered in this analysis.