Assessment of garden egg production in Giri town, Gwagwalada Area Council, Federal Capital Territory, Abuja, Nigeria

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The study, assessed garden egg production in Giri, Gwagwalada Area Council, Federal Capital Territory, Abuja, to determine the level of garden production in the area, identify the varieties of garden egg being produced in Giri, cropping systems being practiced in the area, the strength, weakness, opportunities, the major production problems facing the farmers and to recommend possible interventions for improvement. Results revealed that 86% of the farmers were males while 14% were females and 62% were within the ages of 20 to 30 years. Out of the 4 varieties of garden egg identified in the area (yellow, white, green and small green types respectively), farmers grow significantly, the white variety. The dominant cropping system (65%) is sole cropping in block farming system, or phased cropping system or relay cropping system. For the 35% mixed cropping being practiced, the main component crops include maize, yam, guinea-corn, okra, groundnut, pepper and tomato. The identified problems of the garden egg production in the area include, soil fertility maintenance, inadequate finance, poor transportation system and lack of storage facilities etc.

Key words: Garden egg production, eggplant, farmers, soil fertility maintenance

INTRODUCTION

Vegetables (leafy and fruits) are widely grown in most parts of sub-Saharan Africa, especially, in the urban areas, and they constitute the most affordable and sustainable source of micronutrients in diets.

The name “Garden egg plant” was derived from the shape of the fruits of some varieties which are white and shaped like chicken eggs (Chen et al., 2001). The plant (Solanum spp) is a vegetable with increasing popularity in the world (Pessarakli and Dris, 2003), and it originated from Tropical Africa (Norman, 1992). It is an economic flowering plant belonging to the family Solanaceae, of which members of about 1,400 species found throughout the temperate and tropical regions of the world are mostly herbaceous plants. The fruit of the plant comes in a wide array of shapes and colours, some are yellow and small with green stripes; there are the big yellow ones with white colour and flat ribbed green types among others (Chen et al., 2001).

The importance of the garden-egg cannot be over emphasized. It is consumed on daily basis by urban families and also represents the main source of income for producing households in West Africa (Danquah-Jones, 2000). Nutritionally, garden egg contains water (92.5%), protein (1%), fat (0.3%), and carbohydrates (6%). They contain between 30 and 50% of iron (Fe), fiber, potassium (K), manganese (Mn), copper (Cu) and vitamins; thiamin (vitamin B₁), B₆, folate, magnesium and niacin. Egg plant also contains phyto-nutrients such as nasunin and chlorogenic acid (Sabo and Dia, 2009). It is a very good source of dietary fiber, potassium, manganese, copper and vitamin B₆, folate, magnesium and niacin. Egg plant also contains phyto-nutrients such as nasunin and chlorogenic acid. It is a valuable vegetable for canning industries for garden-egg paste,
sautéed garden-egg and other products. The fruits are fried, stewed, marinated and prepared in other ways. The garden egg plant with its bitter taste and spongy texture could really make an amazing pot of stew with a nice aroma. When eaten with boiled yam or rice, it becomes a delicacy you do not want to miss at the slightest opportunity.

Medicinally, they are processed and used in the preparation of condiments and products used in treating different diseases and health problems (Burkill, 1985). A meal of garden egg is proven to be of benefits to patients suffering from raised intraocular pressure (glaucoma) and convergence insufficiency, as well as in heart diseases and Arteriosclerosis (Harish et al., 2008).

The plant can be regarded as a brain food because it houses the anthocyanin phytonutrient found in its skin, Nasunin, a potent antioxidant and free radical scavenger that has been shown to protect cell membranes from damage.

Studies have shown that nasunin protects the fats in brain cell membranes. Nasunin is not only a potent free-radical scavenger, but is also an iron chelator. Iron is an essential nutrient, necessary for oxygen transport, normal immune function and collagen synthesis, but when it becomes too much in the blood stream; it becomes a major concern. Excess iron increases free radical production and is associated with an increased risk of heart disease and cancer. Menstruating women, who lose iron every month in their menstrual flow, are unlikely to be at risk, but in post-menopausal women and men, iron, which is not easily excreted, can accumulate.

By chelating iron, nasunin lessens free radical formation with numerous beneficial results including protecting the blood cholesterol from peroxidation, preventing cellular damage that can promote cancer, and lessening free radical damage in joints, which is a primary factor in rheumatoid arthritis. The predominant phenolic compound found in garden eggs is chlorogenic acid, which is one of the most potent free radical scavengers found in plant tissues.

The chlorogenic acid performs antimutagenic (anti-cancer) activities in the body. It also performs anti-LDL (bad cholesterol) activities by increasing the levels of HDL (good cholesterol) in the body and at the same time has antiviral and antimicrobial properties.

Consuming high amounts of garden eggs have been found to be beneficial for people with glaucoma because it lowers the eye pressure. Egg plant contains measurable amounts of oxalates which are naturally-occurring substances found in plants, animals, and human beings. When oxalates become too concentrated in body fluids, they can crystallize and cause health problems. For this reason, individuals with already existing and untreated kidney or gall bladder problems may want to avoid eating egg plant.

Chewing thoroughly while eating, can enable you get significant benefits, including absorption of calcium from calcium-rich foods plant foods that also contain oxalic acid. As such, eating garden eggs does not stop you from meeting your calcium requirements. Egg plant is low in calories and high in fibre. The egg plant is good for carbohydrate counters and dieters can actually snack on garden eggs in-between meals.

Production of garden-egg is highly concentrated with 85% of the output coming from five (5) countries. Presently, China is the world largest producer (56% of garden-egg output), followed by India (26%), Egypt, Turkey and Indonesia. Meanwhile, more than 2,048,788 ha are devoted to cultivation of garden egg (FAO, 2008). In the United State of America, Georgia is the largest producing State.

African garden-egg is one of the most commonly consumed fruit vegetable in the Tropical Africa, in quantity and value and probably, the third after Lycopersicum esculentum (tomato) and Alum cepa (onions) and before Okra. According to Girth et al. (1989), a rough estimate for a few countries indicates an annual production of 8,000 tonnes in Senegal, 60,000 tonnes in Cote d’Ivoire and 4,500 tonnes in Burkina Faso.

In Nigeria, garden egg is a very important vegetable crop grown on commercial scale in some parts of the country. However, the small scale growers account for at least 86% of the total production. In the South -East of Nigeria, specifically in Abia State, garden-egg popularly called "Mikimiki " (big sized green fruit with very deep and sweet “endocarp”) is grown commercially while in the savannah zone of Nigeria; the yellow, white and thick green skinned varieties are grown on large scale. Garden-egg production in Giri, Gwagwalada Area Council, Abuja, Nigeria, seems to be a lucrative venture for the peasant farmers. Production has been all year round and even unable to meet the market demand for the products. Quite a number of varieties of garden egg fruits are being sold in this area both in retail and wholesale sale. Unfortunately, there has been little or no information on the production of the crop in the study area.

Therefore, this trial is designed to assess garden-egg production in Giri, specifically, to identify varieties being grown in the area, the cropping systems used by the farmers, identify the strength, weakness, major constraints of the farmers in the business, market out-let and to recommend possible interventions for improvements.

MATERIALS AND METHODS

The trial was conducted in Giri village, Gwagwalada Area Council, Federal Capital Territory, Abuja. Abuja is located between latitude 6° 45’ and 7° 39’ E and longitude 8° 25’ and 9° 20’ N, while Gwagwalada is located on latitude 8° 10’ E and longitude 8° 50’ N. The population of Gwagwalada Area Council according to the National Population Census of 2006 is 157,770.

Gwagwalada is characterized by two distinct seasons;
the raining and dry seasons. The raining season starts fully from May to October while the dry season starts from November to April (Ishaya and Grace, 2007). The temperature ranges from 30 to 37°C yearly with the highest temperature experienced in the month of March. The mean annual rain fall is approximately 1,650 mm (Balogun 2001). 60% of the rain falls in the months of July and September.

The predominant soil type is the ferruginous tropical soils which are suitable for farming. Basically, the people in Giri village are the Gwari and other tribes who are mostly settlers such as the Hausas. Majority of the farmers are small-scale farmers with an average farm size of about one hectare. Farming practices involve the use of hand tools and other simple implements. The crops widely grown in the area are yam, maize, sorghum, millet, okra and pepper etc and vegetables like, fluted pumpkin and garden egg. 80% of them grow garden egg as main crop.

For effective data collection, Giri village was divided into two zones; zone one, (GiriKpasele) and zone two (GiriShinka). The target population in these zones was the garden egg farmers only. Through the assistance of the local council department of agriculture, the list of garden egg farmers in the two zones, within the metropolis was obtained. Data for study were mainly primary data collected from the farmers during the 2009 and 2010 planting season with the use of a structured questionnaire. This was done through cost route approach. Information was collected on input use, output level and socio-economic characteristics. In zone one, 250 questionnaires were distributed while in zone two 150 questionnaires were distributed. More questionnaires were distributed in zone one than in zone two because it has more population of garden egg farmers than zone two. Thus, a total of 400 questionnaires were distributed for the trial. Percent recovery was 97%. During data collection, oral interviews were also conducted with the farmers.

Most of the farmers were visited at their farm sites, in their homes and others at selling points. Only those who produce and sell garden-egg were interviewed in the market. Data collected include, sex of the farmers, age distribution, farm size per farmer, varieties of garden-egg produced, cropping systems used in the area, component crops produced, Socio-economic problems confronting the farmers.

The data collected were analyzed using descriptive statistics (mean and standard deviation) (Coelli and Battese, 1996) as well as the student-t test statistic were used to analyze the data collected. Means of the results on the parameters were used to construct tables and bar charts to show the trends of results of the study.

RESULTS AND DISCUSSION

Figure 1 shows sex distribution of garden egg farmers in Giri town. 86% of the farmers were men while 14% were women. While more men were engaged in the field, the women were involved in harvesting, processing, marketing and taking care of their families. Short-term trainings and on the farm trials being conducted occasionally by Agricultural Development Project (ADP) were attended mainly by the male farmers. The significant involvement of the men in garden egg
Table 1. Proximate analysis of garden egg fruits.

<table>
<thead>
<tr>
<th>Nutrients</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>102 KJ (24 kcal)</td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>5.7 g</td>
</tr>
<tr>
<td>Sugar</td>
<td>2.35</td>
</tr>
<tr>
<td>Fat</td>
<td>0.19 g</td>
</tr>
<tr>
<td>Protein</td>
<td>0.01g</td>
</tr>
<tr>
<td>Vitamin B₆</td>
<td>0.084 mg (6%)</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>2.2 mg (4%)</td>
</tr>
<tr>
<td>Calcium</td>
<td>9 mg (1%)</td>
</tr>
<tr>
<td>Magnesium</td>
<td>14 mg (13%)</td>
</tr>
<tr>
<td>Iron</td>
<td>0.24 mg (2%)</td>
</tr>
<tr>
<td>Phosphorous</td>
<td>25 mg (4%)</td>
</tr>
<tr>
<td>Potassium</td>
<td>230 mg (5%)</td>
</tr>
<tr>
<td>Manganese</td>
<td>0.35 mg (13%)</td>
</tr>
<tr>
<td>Zinc</td>
<td>0.16 mg (2%)</td>
</tr>
<tr>
<td>Vitamin B₉</td>
<td>22mg (6%)</td>
</tr>
<tr>
<td>Fiber</td>
<td>3.4 g</td>
</tr>
</tbody>
</table>

Table 2. Frequency distribution of Technical efficiency of garden egg farmers in Giri Town

<table>
<thead>
<tr>
<th>Efficiency level</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.10-0.19</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.20-0.29</td>
<td>5</td>
<td>5.56</td>
</tr>
<tr>
<td>0.30-0.39</td>
<td>74</td>
<td>64.44</td>
</tr>
<tr>
<td>0.40-0.49</td>
<td>29</td>
<td>21.11</td>
</tr>
<tr>
<td>0.50-0.59</td>
<td>12</td>
<td>18.89</td>
</tr>
</tbody>
</table>

Source: field survey, 2010

production in Giri compared to the women may be attributed to the fact that all agronomic practices involved in garden egg production are done manually with hand tools (holes and matchets), thus, confirming the labour intensity of the crop. Several other studies (Umoh, 2006; Okezie and Okoye, 2006; Udoh and Etim, 2008) also had similar findings.

The study, as shown in Figure 2, indicates that 52% of the garden egg farmers in Giri were within the age bracket of 20 to 30 years, 28% were between 31 to 40 years, 14% between 41 to 50 years and 6% fell in the age bracket of 5 to 60 years. Thus, the farmers were young as indicated by the age bracket of 20 to 30 years. This implied that significantly, labour force for garden egg production in Giri was supplied by the youths (20 to 40) years. Perhaps, the absence of good schools (primary and secondary) and poor educational status of most parents in the area may have been responsible for the youths being involved mainly in farming activities. With relatively available cheap labour in Nigeria, extensive use of human labour for farming has been shown to make vegetable farming, especially, in the urban areas profitable (Enete and Okon, 2008).

Most parents, as a result of the profitability of the garden egg farming, push their children to farming instead of going to school. With poor education, the farmers generally have poor technical knowledge in the modern day farming which invariably might have been responsible for the overall low technical efficiency of the farmers in Giri Metropolis (Table 2). Thus, both experience and education could equip the farmers with relevant skills for enhanced farm management and hence, productivity. Therefore, the Federal Government needs to establish Schools in Giri town ranging from primary to secondary schools, even a college of Agriculture as an affiliate of the University of Abuja. In their study on the technical efficiency and its determinants in garden egg production, Ubokudom et al.
Figure 3. Farm size distribution of garden egg farmers in Giri town 1 (< 1 ha) and 2 (1 and >1 ha).

(2010) reported that age of the farmer had a negative coefficient but was not significant in its effect on production of garden egg. The study showed that Farmers in Giri village who are above 60 years were not involved in garden egg production. A greater percentage of them were involved in yam production which they described as a prestigious farm business.

Results on farm-size distribution of garden-egg farmers in Giri, is shown on Figure 3. Statistically, 82% of the farmers have farm sizes less than one hectare while 18% have farm sizes of one or more than one hectare. Investigation showed that women generally control smaller farm lands than men. The study also revealed that smaller farms are more technically efficient than larger farms. Considering the small scale nature of garden egg production in the area, this result further supports Schult's (1964) hypothesis that small farm households in developing countries are "poor but efficient". Also Mkhabela (2005) in comparing the efficiency of level between the small and large scale farmers, noted that small scale farmers (those who have below 1 ha of vegetable farm) were more efficient than large scale farmers (those who have more than 1 ha of vegetable farm). The above situation implied that men are less technically efficient than women in garden egg production. This is surprising, because men are usually more endowed with resource inputs than women. Thus, to improve garden egg production in Giri significantly, women should be encouraged to go into large scale production.

Of the three varieties of garden egg (white, eknu bubum; Yellow, Eknu kumbelu; and Green, Eknu byejhe) commercially sold in Giri town, investigation showed that only one variety, the White (Eknu bubum) is being produced in Giri. So far no study has been made on the possibility of growing on Giri soil, the other two varieties; Yellow and Green being brought to Giri from the Sudan and Sahel Savannah zones of Nigeria. Middle men who deal on garden egg marketing, bring in large quantities, the yellow and the green varieties to Giri, where as a result of its strategic position, favours large scale production and marketing of garden egg. These middle men in turn buy, in very large quantities, the white variety of garden egg that is produced in Giri and sent it to other parts of Nigeria. This variety is pure white, sweet and very attractive on display. Proximate analysis of the fruits to show its nutritional values is shown in Table 1.

Ubokudom et al (2010) in their study reported that the coefficient of labour was positive and significant at 5% level of probability, showing the importance of labour in garden egg production. From the study, it was found that the number of labour employed by the farmers was a function of farm size and finance. The average labour employed by a farmer is approximately 5, with the farmers having farm size less than 1 ha. and above 5 for farmers who have more than 1 ha. The study also showed that 55% of the farmers employ family labour while 45% employ hired labour. This factor of using family labour (55%) for garden egg production contributed significantly to poor education of their children.

Apart from garden egg production, the study showed that farmers in Giri town grow in commercial quantity the following crops; Maize, Guinea corn, Okra, Tomato, Ground nut and Pepper. 80% of the farmers practice sole cropping in block system or in phased form of cropping. Under block system, the farmer divides the farm into different blocks and different crops are grown in different blocks in sole cropping fashion. Others grow one crop at of garden egg. The study showed that farmers in Giri village who are above 60 years were not involved in garden egg production. A greater percentage of them were involved in yam production which they described as a prestigious farm business.

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The basic problems affecting garden egg production as identified in the study include inadequate finance, high cost of fertilizers, fluctuating market prices, high cost of labour, pests and diseases, poor transportation system, lack of storage facilities and poor soil fertility. The most significant problem affecting the farmers is lack of storage facilities. During the growing season, the farmers produce the garden egg fruits in excess quantity and since there are no storage facilities for the fruits, a greater percentage of it is lost due to spoilage. All fruits and vegetables contain enzymes and bacteria that, over time, breakdown the destroy nutrients and change the color, flavor, and texture of food during frozen storage. Investigation showed that a garden egg farmer in Giri town loses on average 30% of his total output in garden egg.

References


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