

Economics of Onion Production in Malumfashi Local Government Area, Katsina State, Nigeria: A Comparative Analysis of Onion Bulb and Onion Seed Production.

ABDU BABANGIDA UMAR

Department of Agricultural Technology
Hassan Usman Katsina Polytechnic.
E-mail: abdubau@gmail.com

ABSTRACT

The study was conducted at Dayi irrigation site, Malumfashi Local Area, Katsina State, Nigeria. The objective was to evaluate the socio-economic characteristics of onion producers, profitability of onion production and compare the return from onion seed and onion bulb production. The study was carried out using well-structured questionnaire administered to 70 farmers, 35 for each category of producers (onion bulb and seed) randomly selected. The data was analyzed by using descriptive statistics, gross margin analysis and t-test analysis. The result indicated that majority the respondents were male, aged between 40-50 years with an average family size was 6-10. Onion seed farmers have higher average gross margin of ₦112, 917 with higher average variable cost of ₦11, 697 while onion bulb producer have lower average gross margin of 56,963 with lower average variable cost ₦241. The result of the profitability index also reveals higher benefits for investment in onion seed production enterprise with a profitability index of 9.7 although both methods of production are found to be profitable.

Keywords: Irrigation, Profitability, Onion Seed, Onion Bulb.

Introduction

Onion (*Allium cepa* L.) belongs to the family *liliacea*. The word onion comes from the Latin word unio meaning "one" because each onion plant produces only a single bulb and single seed stalk (Anyanwu, 2003). According to Basra *et al.* (1994) onions can be used usually chopped or sliced, in almost every type of food including cooked foods and fresh salad and as a spicy garnish. Many Archeologists, botanists and food historians believe that onions were first grown in Iran and West Pakistan (Hugues, 2001). Onion is close relative to garlic; the leaves are hollow cylindrical structures, differentiated in to two

parts, a sheathing base and hollow cylindrical green blade. Thickening of the leaf base give rise to the bulb during vegetative stage of growth. However, the fruit capsule bears the small black seed which are viable only for short period of time depending on the level of storage system (Adeneji *et al.*, 1991). From economic point of view, in any one year crop yield analysis, the total gross margin should not be less than overheads, if the farmer is to avoid extra borrowing, and a valid comparison can only be made in terms of a production unit such as land and labour common to all the farmers activities being compared (Aderinto and Abdullah, 2004). Onion production is an important enterprise for people living on the lowland (*Fadama*) areas of northern Nigeria, Katsina State inclusive. Aderinta and Abdullahi (2004) are of the opinion that economic analysis should help farmers and marketers to make better production and sales decision rather than depend only on local tradition and past experience. The study describes the socio-economic characteristics of onion farmers in the study area, asses the profitability of onion production for seed and for bulb.

Research Methodology

Description of the Study Area

The study was conducted in Katsina state, Nigeria. The state lies in the Sudan-Sahel agro-ecological zone (Anon 2006). The state lies between latitudes 11⁰ and 13⁰N and between 6⁰ and 9⁰E. The state is made up of 34 local government areas. The study was undertaken in Dayi irrigation site in Malumfashi Local Government Area, 14km away from the north east of Malumfashi town. It bordered with Musawa local government to the north, Dansarai village to the north east, Dansaka village to the south east, Gorar Fata to the south west and TugenNa'almato the west. The area has an average annual rainfall ranges from 600mm to 800mm and an average temperature of 34°C (Anon, 2007). The main occupation of the people in the area is farming and animal rearing. The Dam where most of the farmers used to cultivate onion seed and onion bulb is located at 2km away from south east of Dayi village settlement.

Sample and Sampling Technique

In this study, a total of 70 farmers were randomly selected from the list of onion seed farmers. A total of seventy questionnaires were distributed, 35 for onion seed producers and 35 for onion bulb producers.

Method of Data Collection

The method use in collecting the data from the farmers was by interview schedule with the aid of well-structured questionnaire. The questionnaire was designed to gather the required information about socio-economic

characteristics of farmers engaged in commercial onion seed and onion bulb production. Production variables (costs, incomes) and problems associated with the two method of production (onion seed and onion bulb production). The data obtained was analyzed by the following statistical methods:

Simple descriptive statistics: Using frequency and percentages.

Gross Margin Analysis: The Gross Margin (GM) per ha for an enterprise is given by the equation:

$$GM = Q_y P_y - \sum_{i=1}^n X_i P_{xi}$$

Where,

Q_y = total output of the product (Kg)

P_y = unit price of the product (N)

$Q_y P_y$ = total revenue derived (or gross returns)

x_i = quantity of the i^{th} input used.

P_{xi} = price per unit of the i^{th} input (N)

\sum_i = summation inputs 1 to n i.e. total variable cost

i.e. $GM = GR - TVC$ (Philippe and Komolafe, 2006).

T-Test analysis was used to compare the mean income obtainable from the two groups of farmers. It is given by the formula.

$$t = \frac{\frac{X_1}{n_1} - \frac{X_2}{n_2}}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

where:

X_1 = mean income of onion seed producers

X_2 = mean income of onion bulb producers.

S_1 = standard deviation of income for onion seed producers

S_2 = standard deviation of income bulb producers

N_1 = Number of onion seed producers, N_2 = Number of onion bulb producers

Results and Discussion

Table 1 shows the sex, age, family size, educational level and years of farming experience of the respondents. The data showed that majority (77%) of the onion seed farmers were between 31-50 years, this correspond with 71% onion bulb farmers.

Table1: Socio-Economic Characteristic of Onion Farmers in the Study Area.

| Variable | Onion seed Producers | | Bulb Producers | |
|------------------------------------|-----------------------------|------------|-----------------------|------------|
| Gender | | (%) | | (%) |
| Male | 35 | 100 | 33 | 94 |
| Female | 0 | 0 | 2 | 6 |
| Total | 35 | 100 | 35 | 100 |
| Age(years) | | | | |
| 21-30 | 6 | 17.0 | 6 | 7 |
| 31-40 | 14 | 40.0 | 10 | 29 |
| 41-50 | 13 | 37.0 | 15 | 43 |
| > 51 | 2 | 6.0 | 4 | 11 |
| Total | 35 | 100 | 35 | 100 |
| Family size(number) | | | | |
| 1-5 | 3 | 8 | 2 | 6 |
| 6-10 | 17 | 49 | 19 | 54 |
| 11-15 | 10 | 29 | 10 | 29 |
| >15 | 5 | 14 | 4 | 11 |
| Total | 35 | 100 | 35 | 100 |
| Educational level | | | | |
| No formal education | 10 | 29 | 11 | 31 |
| Primary school | 10 | 29 | 7 | 20 |
| Secondary school | 5 | 14 | 8 | 23 |
| Tertiary education | 3 | 8 | 3 | 9 |
| Islamic education | 7 | 20 | 6 | 17 |
| Total | 35 | 100 | 35 | 100 |
| Years of Farming experience | | | | |
| 1-10 | 12 | 34 | 12 | 34 |
| 11-20 | 9 | 26 | 9 | 26 |
| >20 | 14 | 40 | 14 | 40 |
| Total | 35 | 100 | 35 | 100 |

Source: Study data, 2010

This indicated that youth and mature adults are the most participants in onion production in the study area. This finding corresponds with (Onuk *et al.*, 2010). This implies that they are still in their economic active age which could result in a positive effect on production. 100% of onion seed farmers were male, while 94.0% of onion bulb farmers were males, and only 6% of onion bulb farmers were female. This is corresponded with Quisumbing (1994) who reported that

there has been a great disparity between women and men in term of participation in agricultural activities. In all cases male dominated the production process probably due to Islamic religious background of the respondents. On family size, 49% and 54% of onion seed and onion bulb farmers have 6-10 member of family respectively. The size of family has positive impact on agricultural production because of the predominance of family labour used for production. 71% of onion seed farmers and 69% of onion bulb farmers have varying levels of education respectively, while 29% and 31% of both the two categories did not have formal education. This shows that majority of those participants have one form of formal education or the other necessary to acquire the knowledge needed concerning variable costs and incomes associated with onion production in the study area. This is in line with Onuk *et al.* (2010) who states that formal education have a positive influence on adoption of innovation since low level of education or no education leads to poor adoption, as observed by Njoku, (1991) and Agbamu (1993) who maintained that inability of farmers to read or write can lead to poor adoption of improved innovations. Majority, (40%) of onion seed and onion bulb farmers have 20 and above years of farming experience which indicated that they have acquired enough knowledge and experience about onion production techniques in the study area. All the respondents have farm sizes ranging from 0-0.5 hectares. This shows the small size holdings of onion producers. This is because onion production is capital intensive as it is a high value crop that requiring adequate inputs, thus farmers adopt farm sizes within their management capability. Gross margin analysis was used to determine the profitability of onion production under the two systems in the study area. It is assumed that gross margin equivalent to net farm income because fixed cost is negligible in the production process.

Table 2 showed that labour and irrigation had the total average variable cost of 35% respectively, indicating that labour and irrigation constitutes the major proportion of total variable cost of onion seed production. This agrees with Muhammad (2007) who reported that onion require much labour and irrigation which lead to the high cost of these inputs among the farmers. While, 19%, 6% and 5% were for fertilizer, seeds and chemicals respectively. The result also showed that onion seed producers have total average variable cost of ₦11, 697 which is greater than that of the average total variable cost of onion bulb producers which is ₦8241, and the average gross margin for onion seed producers ₦112, 917 is greater than that of the onion bulb producers which is ₦56,963 indicating that the average gross margin obtained by the onion seed farmers is greater than that of the onion bulb farmers. This corresponds with Aderinto and Abdullahi (2004) who reported that: for simple changes in

activities, if one activity has gross margin of 20 naira per hectare on a particular soil type and another has 40 naira per hectare, then provided certain qualifications are met, the activity with gross margin of 40 naira should replace the one with 20 naira. Table 2 also showed the average costs and return of onion bulb farmers. The result showed that fertilizer and seedlings has 30% and 24% of TVC respectively. Labour and irrigation have the same average variable cost of 18% respectively and chemicals have 10% of the average variable cost. The result further showed that onion bulb farmers have total average variable cost (AVC) of ₦8,241 and the total average gross margin of ₦56,963 which all were less than that of the onion seed farmers. The return to investment (profitability index) of the two onion production methods indicated seed producers have higher profitability index (₦9.7) compared to bulb producer ₦6.9. This indicated the general profitability of onion production in the area using either of the methods of production.

Table 2: Distribution of the Average Cost and Return Analysis from the Two Categories of Onion Farmers.

| Items of variable | Seed Producers | | Onion bulb Producers | |
|------------------------------------|--------------------------|----------|----------------------|----------|
| | cost/income costs (₦/ha) | % of TVC | Costs (₦) | % of TVC |
| 1. Costs | | | | |
| a. Seed/seedlings | 742 | 6.0 | 1951 | 24.0 |
| b. Labour | 4139 | 35.0 | 1493 | 18.0 |
| c. Fertilizer | 2167 | 19.0 | 2455 | 30.0 |
| d. Chemical | 533 | 5.0 | 835 | 10.0 |
| e. Irrigation | 4117 | 35.0 | 1508 | 18.0 |
| f. Total variable cost (a+b+c+d+e) | 11697 | 100 | 8241 | 100 |
| 2. Income | | | | |
| g. Gross Income | 124614 | | 65204 | |
| h. Gross margin (g-f) | 112917 | | 56963 | |
| Return to Investment (Gm/TVC) h/f | 9.7 | | 6.9 | |

Source: Study Questionnaire, 2010

Test of differences of mean Incomes of Onion Bulb and Onion Seed Farmers

The test to ascertain if there was any difference in mean income of the two categories of onion producers is presented in Table 4. The table indicates that the average gross margin for onion bulb producers was N65204, while that of onion seed producers was N124614. This indicated that there is a significant difference in incomes of the two categories of onion farmers both at 1% and at 10% level of probability. It could therefore be concluded that there is significant differences between onion seed and onion bulb production in term of their incomes.

Table 3: Differences of mean Income of Onion seed and Onion Bulb Farmers

| Farmers | Number | Mean | Standard deviation | T-cal | T-tab | T-tab |
|----------------------|--------|--------|--------------------|---------|-------|-------|
| | | | | | at 1% | at 5% |
| Onion Seed Producers | 35 | 124614 | 128.2 | 3228.86 | 2.576 | 1.96 |
| Onion Bulb Producers | 35 | 65204 | 126 | NA | NANA | |

NA- not applicable

Source: Study data, 2010.

Conclusion

Onion production for seed and for bulb was found to be profitable among both categories of farmers in the study area. However, there was found to be a significantly higher return in production of onion for seed as indicated from the results of gross margin analysis and return to investment (profitability index) of ₦9.7 for seed producers and ₦6.9 for bulb producers. As such it could be concluded that commercialization of onion production can go a long way to increase farmers' income, reduce food crisis and malnutrition in Nigeria.

References:

- Abinbola O.A, F. Udoh and A.M Ademola (2001): *Fundamentals of Agricultural Science for Schools and Colleges*. Resmed Publication limited, Ibadan Nigeria pp178.
- Abott J.C and J.PMakeham (1986): *Economic and Marketing in the Tropics*. Longman Scientific and Technical pp 168.
- Adeneji M.O, A. C. C. Udeogabanja, G.C Okeke, Y. Abullahi and C. A. Ihekawumure (1991): *Countdown Senior Secondary Certificate*

Examination Agricultural Science. Evans Brothers Nigeria Publishers limited pp214.

Aderinto A.A and S.H. Abdullahi (2004); *Comprehensive Certificate Economics for Senior Secondary Schools.* Revised Edition University Press Pic, Ibadan pp355.

Agbamu, J.U. (1993). The Analysis of Farmers' Characteristics Associated with Adoption of Management Innovation in Ikorodu LGA of Lagos State, Nigerian Journal of Rural Extension and Development, Vol.1, No. 2.

Anonymous (2007) Malumfashi Local Government Agricultural Department information handbook.

Anyanwu B.O. (2003): *Agricultural Science for Senior Secondary Schools.* Africana Publishers limited pp431.

Basra A.S, B. Singh and C.P Malik (1994): *Growing Onions and Scallions.* The Book mark Organic Gardening Department of Botany, Punjab Agricultural University Ludhiana, India. Retrieved 8th June, 2010

Baumol W.J. (2006): *Business Behavior Value and Growth.* Harcourt and Brace UKpp225.

Brewster J.C (1995): *Crop Production Science in Horticulture.* 3rd Edition. Onion and other Vegetables Allium CAB International pp678.

Elmore A.S. (1997): *An Introduction to Positive Economic.* Oxford University Press London pp599.

Fajuna F.J. (2004): *Managerial Economics.* New Delhi; Vikas Publishing House. PVT limited, pp 677

<http://www.organicgardening-101.com/growinonionshtml>

Hugues, D. Z and Philippe D.L. (2001): *African Gardens and Orchards.* Macmillan Publishers, Ibadan, 33 pp.

Iwena O.A. (2008): *Essential Agricultural Science for Senior Secondary Schools.* Tonad Publishers limited Ibadan Nigeria pp339.

Lowe, R.G. (1986). *Agricultural Revolution in West Africa.* Macmillan Publishers pp295.

- Malumfashi Local Government Information Handbook (2006).
- Mougeot, I.J.A. (2005). The Social, Political and Environmental Dimension of Urban Agriculture. Earth Scan London pp200
- Muhammad, R.G. (2007): *Comprehensive Study of Vegetable Crops*. Geokint Graphical limited Belgium pp601.
- National Population Commission(NPC), (2006). Population Census of the Federal Republic of Nigeria. Analytical Report of the National Population Commission, Abuja, Nigeria.
- Njoku, J.E .(1991). "Factors influencing the adoption of improved oil palm production Technologies by small holders in Imo State, Nigeria."In *Appropriate Agricultural Technologies Resource poor Farmers*. Edited by Olukosi, J.O., Ogungbite, A.O. and Kalu, B.A pp 207-28
- Onuk J.B, J.N Lewis and G.C. McFarlane (2010) *Farm Management and Agricultural Economics*. New Edition. Angus and Robertson limited London pp201.
- Philippe D.L and K. Komolafe (2006): *Agricultural Economics and Agri-business* 3rd Edition. John Wiley and son Inc. New York. pp.677.
- Quisumbing A. (1994): *Gender Differences in Agricultural Productivity, A Survey of Empirical Evidence*. *Nigerian Agricultural Journal* Vol.41 No.1
- Ronald E. Voss, Muke Murray, Kent Branford, S. Keith Mayberry and Ivan M. (1991): *Onion Seed Production in California*, Publication 8008.University of California Division of Agriculture and Natural Resources. Retrieved March 20th, 2010 from <http://anrcatalogue.ucdavis.edu>Upton M. (1989): *Success in Farming*. Macmillan Publishers limited London pp60.
- Upton M. (1989): *Success in Farming*. Macmillan Publishers Limited, London.pp60

References to this paper should be made as follows: Abdu Babangida Umar (2014), Economics of Onion Production in Malumfashi Local Government Area, Katsina State, Nigeria: A Comparative Analysis of Onion Bulb and Onion Seed Production. *J. of Agriculture and Veterinary Sciences*, Vol. 6, No. 2, Pp. 126 - 134.
