



THE ECONOMIC ADVANTAGES OF SPRAY PESTICIDES ON COWPEAS (*Vigna unguiculata L. Walp*) PRODUCTION IN GOMBE LOCAL GOVERNMENT AREA, GOMBE STATE, NIGERIA.

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ABSTRACT

The research focused on the economic advantages of spray pesticides on cowpeas production in Gombe local government area of Gombe state. The research used both primary and secondary data, obtained via pre-tested questionnaires by interview method. The study employed descriptive statistics. Gross margin analysis established the economic effect of pesticides application on cowpea production. Also, ordinary least square regression analysis was adopted to isolate the variables affecting cowpea output in the area. The study revealed that factors dictating the output of cowpea are; quantity of seeds sown, man-labor supplied and expenditure on insecticides applied in the area. It also confirmed the fact that economic profitability in the production of cowpea is the function of the adoption of spray pesticides application. The study recommended that farmers should embrace the use of insecticides since it is accompanied by more economic gains in terms of output and cash returns to the farmers and well-articulated extension services of storages, market and loans facilities be provided to the farmers.

INTRODUCTION

Cowpea originated in Africa and it is widely grown in Africa, Latin America, South-east and in the southern part of the United States (Davis, 1999). The crop is an important source of cheap and available plant protein in Nigeria. Its popularity stems from variety of dishes that are made from it. Cowpea production is mostly found in the savannah ecological zone where it is traditionally grown as sole crop or intercropped with cereals such as millet, maize and sorghum (Adewuyi and Okunmadewa, 2005). Cowpea was mostly cultivated by small size

farmers in the last decades, but now the crop is cultivated in a relatively larger farm size. With adoption of technology in cowpea pest control, the crop is presently witnessing higher yields. (Mohammed, 1989). Okike, Kristjamson and Singh (2007) also stressed that there is a significant increase in cowpea production with the adoption of spray pesticides by farmers in northern Nigeria. Singh, Asante, Ajeibe and Mohammed (1996) stressed that cowpea is an important crop to the livelihood of millions of relatively poor people in Nigeria. From the crop, rural families derive food, animal feeds, cash as well as spill over benefits to their farm lands. It is a cheap source of plant protein to many who cannot afford enough of the expensive animal protein. Gongula and Garjila (2005) stated that the crop yield is generally low as a result of insect pest and diseases, draught, excessive mixture, weeds and mixed cropping. According to him, yield on farmers' plot are usually less than 1000kg ha⁻¹. However, pest and diseases were considered to be the major problem to cowpea yield (Robert 2004). It is in this regard that International institute for tropical agriculture (1994) urged entomologist at national and international research centers to develop ecological sustainable pest control strategies that are affordable and accessible to small scale farmers. The economic benefits of pesticides application in cowpea is not popular among the farmers because of inadequate records to portray the profitability of pesticides application in the study area (Noma 2006). This study was designed to assess whether it is worthwhile using pesticides in cowpea.

OBJECTIVES OF THE STUDY

- i. To determine the economic advantages of spray pesticides on cowpea production in Gombe local government area of Gombe state, Nigeria.
- ii. To determine the socio-economic profile of cowpea farmers in the area.
- iii. To determine the yield of cowpea using spray pesticides as pest control measures during the production period and profitability of using pesticide application in cowpea production in the area of study.

MATERIALS AND METHODS

Study area.

The study area was Gombe local government area of Gombe state, the capital city of the state and the commercial nerve center of the state. The local government is composed of business men and women in all endeavours. And about 70% of its residents are potential farmers. Gombe state has a population of approximately 2.4 million people (2006 census) and lies between

latitude 9°30' and 12°30' north and longitude 8°45' and 11°45' east. The area shares common boundary with Borno, Yobe, Taraba, Bauchi and Adamawa states. The climate of the area consists of both dry and rainy seasons. Gombe temperature is between 17°C minimum and 30°C maximum. The vegetation is mainly guinea savannah grassland with concentration of woodland in the southeast and southwest.

Sampling technique.

The study was carried out in 2007 and 2008 cropping season with a total of 120 respondents who are all seasoned farmers residing in different areas of the town. Both primary and secondary data were used for the study. The primary data were collected based on 2007 cropping season through the use of well-structured pre-tested questionnaires and oral interview schedules. The secondary data were obtained from the publications of the Gombe state agricultural development programme and state ministry of Agriculture. Descriptive statistics was employed to analyze the data obtained from the field which includes; percentages, means ranking and budgetary techniques (Bernard, 1995). The budgetary technique used was adopted from Ibrahim and Telson (2007) for the gross margin analysis that forms the basis for costs and returns analysis. Ordinary test of least square regression analysis was used to get the functional dependence that best fit cowpea production.

The model adapted was implicit form as follows:

$$Y_1 = f(x, X_2, X_3)$$

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + e$$

Where,

Y_1 = output of cowpea in kg ha⁻¹

X_1 = quantity of seeds sown in kg ha⁻¹

X_2 = labor in money ha⁻¹

X_3 = expenditure on pesticide application in naira ha⁻¹ e = stochastic error term

RESULTS AND DISCUSSION

Table 1 shows that majority of the interviewed farmers are within the age of 15-50 years. This suggest that they are strong, capable of making good productive decision and have potential for greater productivity. Hence, they are likely to be more efficient in agricultural production

than older and younger ones (Algahli, 2006).

Table 1: Socio-economic characteristics of respondents.

Variables	NO. of respondents	Percentage
Age		
15-26	8	6.6
27-34	8	6.6
35-46	84	70
>46	20	16.7
Total	120	100
Gender		
Male	109	90.8
Female	11	9.16
Total	120	120
Education qualification		
Non- formal education	35	29.2
Primary school leaver	17	14.1
Secondary school leaver	28	23.3
Tertiary school graduate	7	6.0
Adult education	33	27.8

Total	120	100
Family size		
<5	4	3.0
5-10	60	50.
11-15	38	32.
>15	18	15.
Total	120	100
Income level		
<N50,000.00	36	30.
N50,000.00-N100,000.00	76	63.
N100,000.00-N200,000.00	3	2.5
>N200,000.00	5	4.1
Total	120	100

Majority of the respondents were males constituting about 90.8%, in other words, males engaged in cowpea production more than females in the study area. Most of the farmers were educated (65%) and any increase in agricultural productivity by farmers of non-formal education could be as a result of accumulated experiences in farming (Ibrahim et.al.2007). On family size, most of the families are relatively large and extended in nature which provided read/steady labor for timely execution of farming activities. The income profile of the farmers per annum is very low. This revealed that most of the farmers are within income link of N50, 000.00 to N100, 000.00.

Table 2: Farmers gross margin analysis per hectare.

Treatments	GR (N)	TVC (N)	GM (N)	GM (%)
Cowpea with pesticides	34,056.00	11,291.00	12,613.38	54.32
Cowpea without pesticides	13,000.00	6,333.66	4,132.00	45.68
Total	47,056.00	17,624.66	16,745.38	100.00

Table 3: Regression estimates of coefficient of inputs in cowpea production of double log function.

Variables	Coefficient	t-value
Seed	0.21	2.05*
Labor	0.413	*1.811
Pesticides	0.107	9.13**

1Significant at 1% level.

Table 2 shows the gross margin of N12, 613.38 and N4, 132.30 of individual farmer per hectare for cowpea with pesticides application and without pesticides application respectively. This reflects the fact that cowpea production with pesticides application is very much more profitable about (74.32% per hectare) revealing a high profitability over cowpea production without pesticide application. This finding conformed to that of Alghali (2006) who recorded that yields and income levels increase with the adoption of pesticides in cowpea production. From the multiple regression analysis as contained in table 3, the double log function was selected as the best fit based on the magnitude of the coefficient of determination (R^2) and statistics significance of the estimated regression values. The R^2 indicated that 96.90% variation in yield was explained by the specified independent variables. This is confirmed by Analysis of variance (ANOVA), the F-ratio calculated; 1198.77 is greater than the tabulated F-ratio of 3.95, while in the test of statistical significant, the calculated t* ratio 2.05, 1.81 and 9.13 for quantity of seeds sown, labour and expenditure on pesticides applied respectively are greater than the t-value of 1.684 at 1.0% level of significant. This indicated that the output of cowpea is principally dictated by the variables; seeds(2.05), labour (1.81) and expenditure(9.13). This result tallies with Ibrahim Baba et-al (2007) The coefficients of the independent variables indicates that seeds (0.211), labour (0.413), and pesticides (0.107) are positively and significantly different from zero at 1% level i.e., a 1% increase in the amount of seeds planted, labour supply to the production and pesticides applied per hectare under cowpea production will raise cowpea output by 0.211 and 0.107 respectively.

CONCLUSIONS AND RECOMMENDATIONS

This research work revealed that cowpea production without pesticides application is not economically profitable like that with pesticides application (Morgan 2006). It also Showed that the determinants of cowpea output are the quarterly seeds sown, amount of labour supplied and expenditure on pesticides. Pesticides are generally available in different capacities in the markets but the affordability depends on the income of the farmer. Low earned farmer may find it difficult to practice which always affect their yield. The application techniques of the substance also depend on experience and knowledge. Farmers who are illiterates will find the application difficult to practice and expensive which could result in excessive usage of the chemical leading to poor yield and harm to their lives. This research work therefore recommends that subsidized pesticides be provided by the Government in order to alleviate the suffering of the poor farmers to have access to the modern pesticides at a very low if not free pesticides. The Government should also provide specialists to train farmers on the use of pesticide sprays and its hazardous nature. Also storage, markets and loan facilities be made available to the small scale farmers to strengthen the production base of the small scale farmers.

R2-0.9690

R-0.9682

F-1198.77

REFERENCES

Adewuyi, S.A. and F.Y. Okunmadewa, (2005). Economic efficiency in cowpea farming in Kwara state, Nigeria. *Nigeria Development. Studies 1:*

Algahli, A.M. (2006). Studies on cowpea farming in Nigeria with emphasis on insect pest control.

Journal of Tropical Pest management 37; 71- 74.

Bernard Rosner (1995). **Fundamentals of biostatistics**. Harvard university press, fourth edition, page 299-344.

Davis, D. W. (1991). **Field crop manual**. University of Wilson Sin, extension department.

Dutta, A.C. (1979). **Botany for degree student**, fifth edition, new Delhi Oxford university press, page 353

385.

Gongula, D. I. and Y. Garjila, (2005). The effects of phosphorous on growth and yield of cowpea in Yola. *Journal of Sustainable Devevelopment in Agriultural Environment, 1: 96-101.*

Ibrahim I. B. and T. T. Kwagle (2007). The economic effect and spray pesticides on cowpeas (*Vigna unguiculata* L. walp.) production In Adamawa state, Nigeria. *Journal of agricultural research, 2 (7). 647- 650.*

International Institute of Tropical Agriculture (1994). Annual report, A International Institute of Tropical Agriculture, IITA, Ibadan, Extension Guide Series.

Margam Venu (2006). **Pest management II**. AFP publishers limited, 4 industrial avenue, Ilupeju, Lagos, third edition, pg.27-48.

Mohammed, R.A. and J.M. Teri, (1989). Farmers strategies of insects, pests and disease management in small scale production system. Mgeta Tanzania, *Bulletins of Insecticides Science Application*, 10:821-825.

Noma (1991): *News Magazine* vol.9 pp.9-10 Okike, I., S.A. Kristjamson and B.B. Singh,(2007). Potential adoption and diffusion of improved dual purpose cowpea in the dry savannah of Nigeria: An evaluation using combination of participatory and structured approaches.

Robert Mahanty (2004). **Agricultural pesticides and soils**. Third edition. Dalag print and pack Ltd, university press plc. Ibadan. Pg. 66-78.

Singh, B.B., S.K. Asante, H.M. Ajeibe and S.H. Mohammed, (1996). Highlights on IITA cowpea relevant to Northern Nigeria. Presentation at Lake Chad Research Institute, Maiduguri, Nigeria.