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FARMERS' PERCEPTION OF PROBLEMS INFLUENCING MAIZE STORAGE IN ABUJA, NIGERIA

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ABSTRACT

Excess maize (*Zea mays*) grains need to be stored in order to maintain constant supply all-year-round. However, most of the small scale farmers sell large proportion of their produce immediately after harvest when price is low due to high supply. In view of this, a study was conducted to identify the problems that prevent farmers from storing maize in Abuja. A multi-stage sampling technique was adopted while structured questionnaires were used for data collection. A total of 160 maize farmers were interviewed in four agricultural zones (40 farmers from each zone) of Abuja. Data obtained were analyzed using one-way analysis of variance and mean separation was done at 5% probability level. Results showed that there was significant difference ($P < 0.05$) in the perceptions of maize farmers regarding problems that militated against their desire to store part of their maize grains after harvest. The most limiting problem against maize storage was rodent attack (2.70) and the cost of storage materials (2.33). On the other hand, the least limiting problem to maize storage was fear of the quantity the household would consume if stored (0.74). In all the zones, Abuja East Agricultural Zone was the worst hit (1.95) in terms of the problems. Based on the findings, it is recommended that government and non-governmental agencies should embark on campaign to sensitize the farmers on the use of rodenticides and other cultural means of controlling rodents.

Keywords: rats and rodents, storage materials, mean perception, agricultural zones

INTRODUCTION

Maize (*Zea mays*) is one of the most important cereals in the world. It has the highest world average yield per hectare among cereals followed by rice, wheat and millet (ASCE, 2008). It has its significance as a source of raw materials to a large number of industrial products besides its uses as human food and animal feed. According to Iken and Amusa (2004), the cultivation of maize was initially for subsistence purposes, but it has gradually become an important commercial crop on which many agro-allied industries depend for raw materials. According to Philip *et al.* (2006), it is the third

most important cereal crop and is grown largely in the rainforest and Guinea Savannah vegetation zones. Because of the importance of maize, Thamaga-Chitja *et al.* (2004) stated that maize needs to be stored from one harvest to the next in order to maintain its constant supply all-year-round and to preserve its quality until required for use. Nigeria is one of the few countries where maize can be grown all the year round either through irrigation or rain-fed. Edache (1999) stated that maize is produced across the country right from the mangrove region in the southern to the sahel savannah in the northern part of Nigeria. The author further added that the largest maize producing belts

are in Kwara, Benue, Kaduna, Oyo, Ondo, and Ogun states. In support of the fact that maize can be grown in any part of Nigeria, Ado *et al.* (2004) also stated that maize is grown throughout Nigeria from Bayelsa State to Kebbi State and from Delta State to Borno State. In terms of output, ASCE (2008) stated that Nigeria produces over 6 million tonnes of the 624 million tonnes of maize produced annually worldwide.

From the forgoing, it is very clear that maize occupies a prime position among the food crops grown in Nigeria because it is one of the staples widely grown in the country. Nigeria has favourable conditions for the production of maize. Apart from the favourable conditions, there are different ways of storing maize which the farmers can adopt. The various storage techniques according to Sokumade and Oluwatayo (2009), range from open field storage, polyethylene, jute bags, and platform/tree storage to built structures.

In spite of the favorable conditions in Nigeria, the price is high and unstable (fluctuating) indicating that there is a problem. For instance, the average prices of maize per 50kg in Abuja in 2008, 2009 and 2010 were N2,640, N3,500 and N3,000, respectively (ASCE, 2008; 2009; 2010). Motivated by the fluctuations in price, the aim of this study is to find out the problems that prevent some farmers from storing maize after harvest in Abuja. This is necessary because according to Garba (2000), Abuja lies in the transitional zone between the grain dominated agriculture of the north and the predominantly root crop farming of the forest zone. In other words, it is situated between the savannah in the north and forest vegetation in the south with enough potentials for supporting agricultural production.

The study is important because Sokunade and Oluwatayo (2009) stated that some of

the functions of agricultural produce storage are quantity equalization and market price stabilization. Again, effective storage, according to Thamaga-Chitja *et al.* (2004), plays an important role in stabilizing food supply at the household level by smoothing seasonal food production. In other words, successful farm storage according to Sokunade and Oluwatayo (2009) enables farmers to sell maize when the price is most attractive (off-season).

RESEARCH METHODOLOGY

This study was conducted in Abuja, Nigeria located between latitudes 8°25' and 9°25' North of the equator and longitudes 6°45' and 7°45' East. The population for the study comprised the small scale maize farmers in Abuja. A multi-stage sampling and structured questionnaires were used for data collection. The area were delineated down to cells by Agricultural Development Programme (ADP). Presently, Abuja has four (4) agricultural zones - Central, Eastern, Northern and Western Zones with twelve (12) agricultural blocks and ninety three (93) cells (AADP, 2009). In each of the four (4) agricultural zones, two (2) agricultural extension blocks were randomly chosen giving a total of eight (8) agricultural extension blocks. From each of the agricultural extension blocks, ten (10) cells were randomly chosen giving a total of 80 cells. In each of the cells, three (3) small scale maize farmers were randomly selected and interviewed. From those that were returned, two (2) properly filled questionnaires from each cell were used for the analysis. This gave a total of twenty (20) and forty (40) respondents per agricultural extension block and agricultural zone, respectively. For the four (4) agricultural zones, a total of 160 respondents were used for the analysis. Equal number (40 from each of the agricultural zones) was used because one-way repeated measure Analysis of Variance (ANOVA) was used for the analysis. By

implication, the forty (40) respondents for each agricultural zone served as replications. The model specification is:

$$Y_{ij} = \mu + T_i + e_{ij}$$

Where,

Y_{ij} = Individual farmer's response on the seriousness of the problem

μ = General mean (constant)

T_i = Treatments here refer to the 13 problems specified in the questionnaire that influence maize grain storage in the study area.

e_{ij} = Error term

The seriousness of the problems was verified using 0 - 4 scale viz: Very serious problem = 4; Serious problem = 3; Fairly serious problem = 2; Very little problem = 1; and, Not a problem at all = 0.

The above scores were used for data analysis in line with the study conducted by Shah and Madden (2004); David (2004); Fredrick and Wallnau (2004); Andy (2005). SPSS 15.0 package was used to run the analysis and it was tested at 5% probability level. Mean separation was also done using Bonferroni model.

Table 1: Farmers' mean responses on the problems influencing maize storage

Problems that Affect farmers in storing maize	Agricultural Zones in Abuja				Pooled data
	Northern Zone	Western Zone	Central Zone	Eastern Zone	
Problems of rats and other similar animals in the farm and at home	2.48	2.78	2.88	2.68	2.70
Problems of birds destroying the maize in the farm if allowed to ripe	2.03	2.03	1.58	2.45	2.02
Money to construct local silo	2.30	2.22	1.30	2.28	2.03
Cost of storage materials like plastic cans, bags, etc.	1.95	2.78	2.08	2.53	2.33
Lack of insecticide/pesticide to preserve the grain	2.15	1.70	1.88	2.18	1.98
Problems of shelling the grains	1.78	1.38	1.90	1.55	1.65
Lack of space to construct local silo in the farmers' homes	2.00	0.93	1.13	1.25	1.33
Inadequate space to pack the maize in the house	1.78	0.90	1.13	1.23	1.26
Fear of thieves harvesting the maize if allowed to ripe in the farm	2.13	1.50	1.53	2.30	1.86
Uncertainty in the future price of maize if stored	1.48	1.70	1.45	1.88	1.63
The period of the year the maize matures	1.13	1.15	1.30	2.08	1.41
Low yield after harvest, hence nothing to store	1.28	1.95	1.08	2.33	1.66
Quantity consumed by the family when stored	0.68	0.60	1.00	0.70	0.74
Grand mean total	1.77	1.66	1.55	1.95	1.73

Source: Field data analysis, 2010

RESULTS AND DISCUSSION

Table 1 shows the farmers' mean responses to the problems hindering them from storing maize. The mean responses were arranged according to the four agricultural zones in Abuja. Based on the pooled data results, none of the problems was perceived as being *very serious* (4). The highest problem was that of rat (*Rattus rattus*) and other similar animals (rodents) that destroy maize both in the farm and at home (2.70). This problem was perceived by the farmers as *serious* (3). This confirms the observation of Ofor and Opara (2009) who stated that rodents, particularly, rats and grass cutters cause extensive damage to both maize and sorghum in the northern and southern Guinea Savannah. According to them, rats (*Rattus rattus*) and bush fowls (*Francolinus bicalcaratus*) attack seedlings causing wide gap in crop rows which results in supplying and consequently increased cost and low yield. The second problem was that of the

cost of storage materials like plastic can, jute bags, plastic containers, etc., (2.33) while the least problem was that of fear of the quantity of maize the household would consume if stored (0.74). By implication, the farmers perceived the problem (the quantity of maize the household would consume if stored) as being *very little* (1). At the zonal level, Abuja East Agricultural Zone felt the problems most (1.95) followed by the Northern Agricultural Zone (1.77). Furthermore, the grand mean perception is 1.73 implying that the farmers on average perceived the problems enumerated as *fairly serious* (2) in Abuja because the mean response tended towards two (2). This goes to show that the storage problems maize farmers encounter in Abuja were fair enough to allow them store maize. The value of the grand mean (1.73) indicated that the problems were not *serious* (3).

Table 2 shows the comparisons of the mean responses of farmers across agricultural

Table 2: Mean separation of problems influencing maize storage

Problems influencing maize storage	Mean response value
Problems of rat and other similar animals in the farm and at home	2.70 ^a
Cost of storage materials like plastic cans, bags, e.t.c	2.33 ^{ab}
Money to construct local silo (silo made with mud)	2.03 ^{ab}
Problems of birds destroying the maize in the farm if allowed to ripe	2.02 ^{bc}
Lack of insecticide/pesticide to preserve the grain	1.98 ^{bcd}
Fear of thieves harvesting the maize if allowed to ripe in the farm	1.86 ^{bcd}
Low yield after harvest, hence nothing to store	1.66 ^{cde}
Problems of shelling the grains	1.65 ^{cde}
Uncertainty in the future price of maize if stored	1.63 ^{cde}
The period of the year the maize mature	1.41 ^{de}
Lack of space to construct local silo in the farmers' homes	1.33 ^e
Inadequate space to pack the maize in the house	1.26 ^e
Quantity consumed by the family if stored	0.74 ^f
Grand mean response	1.73

^{abc} Means with different superscript letters differ significantly (P<0.05)

Source: Field data analysis. 2010

zones in the study area. Although the mean response value on rodents' attack (2.70) was higher than that of storage materials (2.33), the mean values did not significantly differ from each other. This implies that the two problems were perceived the same by the farmers. It is apparent that some of the mean responses are relatively higher than others but it is important to note that they are not statistically significant ($P>0.05$). This indicates that farmers' perception of the influence of some of the problems on maize storage was identical. This implies that some of the problems may be difficult to address in isolation. Remarkably, the least limiting problem to maize storage is that of the fear of the quantity the household would consume if stored. The mean value (0.74) of this problem, significantly differed from all other problems. The implication of this mean value is that, among the problems listed, the least problem the maize farmers considered was the quantity their households would consume during the storage period. This is expected because as Sokunade and Oluwatayo (2009) stated, Nigerian farmers store maize in various indigenous storage structures for the purpose of self sustenance and household food security.

CONCLUSION

The goal of food policy in Nigeria is to examine the country's food self-sufficiency status, the gaps between food demand and supply of the various types of food and to recommend appropriate measures which would raise production in quantitative and qualitative terms. To raise food production demands that some factors preventing farmers from storing food crops like maize should be indentified and addressed hence the need for the study. From the findings, it was obvious that several problems discouraged farmers from storing maize grains after harvest but the most outstanding problem was rodents' attack. The least limiting problem to maize storage was the

fear of the quantity the household would consume if stored. Based on the findings, it is, therefore, recommended that government and non-governmental agencies should embark on campaign to sensitize the farmers on the use of rodenticides and other cultural means of controlling rodents.

REFERENCES

- AADP. 2009. Abuja Agricultural Development Programme: Document on the Delineation of Abuja into Zones, Blocks and Cells. Unpublished. p.1-2.
- ASCE. 2008. Essential Commodity Price Polling as at 19th November 2008: Abuja Securities and Commodity Exchange, Federal Ministry of Agriculture and Rural Development, 397 Muhammadu Buhari Way, Central Business District, Abuja Nigeria. www.abujacomex.com/pages/market-data/essential-commodities.php?g=0.
- ASCE. 2009. Essential Commodity Price Polling as at 25th November 2009: Abuja Securities and Commodity Exchange, Federal Ministry of Agriculture and Rural Development, 397 Muhammadu Buhari Way, Central Business District, Abuja Nigeria. www.abujacomex.com/pages/market-data/essential-commodities.php?g=0.
- ASCE. 2010. Essential Commodity Price Polling as at 3rd November 2010: Abuja Securities and Commodity Exchange, Federal Ministry of Agriculture and Rural Development, 397 Muhammadu Buhari Way, Central Business District, Abuja Nigeria. www.abujacomex.com/pages/market-data/essential-commodities.php?g=0.
- Ado, S. G., Adamu, R. S., Hussaini, M. N., Maigida, D. N. and Zarafi, A. B. 2004. Maize. In: N. U. A. Idem, and Showemimo (editors)

Cereals Crops of Nigeria: Principles of Production and Utilization. p. 79-114.

Andy, F. 2005. *Discovering Statistics Using SPSS*. (2nd edition), SAGE Publications, London, p. 427-482.

David, C. H. 2004. *Fundamental Statistics for the Behavioral Sciences* (5th edition), Thomson Higher Education Dan Drive Belmont, C.A., USA, p. 355 - 437.

Edache, O. A. 1999. Agricultural Policy in Relation to Sustainable Maize Production in Nigeria. In: Valencia, J. A., Falaki, A. M., Miko, S. and S. G. Ado (eds) Proceedings of the SG/200/IAR/FMARD/ADPs. National Maize Production Workshop, 22nd - 24th July 1999 held at ABU. Zaria, p. 24.

Fredrick, G. J. and Wallnau, B. L. 2004. *Statistics for the Behavioral Sciences* (6th edition), The Omson Learning Inc, USA, p. 395-471.

Garba, M. L. 2000. Agricultural Development in the Federal Capital Territory. In: Dawan, P. D. (ed.). *Geography of Abuja Federal Capital Territory*. Famous/Asanlu publishers, Minna, Niger State, Nigeria, p. 107-126.

Iken, J. E. and Amusa, N. A. 2004. Maize Research and Production in Nigeria. *African Journal of Biotechnology*, 3(6): 302-307.

Ofor, M. O. and Oparaeke, A. M. 2009. Crop Protection Challenges and Management in Production of Maize and Guinea Corn in Northern Guinea Savannah of Nigeria and Control Measures. Proceedings of the 43rd Annual Conference of Agricultural Society of Nigeria, 1 - 23th Oct., 2009, National University Commission (NUC) and Raw Material Research and Development Commission (RAMRDC), Abuja, p. 24 - 28.

Philip, O. A., Kehinde, A. O. and Ganiyu, O. O. 2006. Principles of Crop Production. IDEAS and INNOVATIONS Publication Ltd., p. 165-175.

Sokumade, A. B. and Oluwatayo, I. B. 2009. Comparative Analysis of Maize Storage Technologies in Kwara State, Nigeria. *International Journal of Sustained Crop Production*, 4(5): 24-31.

Shah, D. A. and Madden, L. V. 2004. Non-parametric Analysis of Ordinal Data in Designed Problemial Experiments. *Phytopathology*, 94(1): 33-43.

Thamaga-Chitja, J. M., Hendriks, S. L., Ortmana, G. F. and Green, M. 2004. Impact of maize storage on rural household food security in northern Kwazuru-Natal. *Journal of Family Ecology and Consumer Sciences*, 32: 8-15.