

Available online at www.ijit.net**International Journal of Integrative sciences, Innovation and Technology (IJIT)**

(A Peer Review E-3 Journal of Science Innovation Technology)

Journal homepage: <http://www.ijit.net/>

eISSN 2278-1145

Research Unlimited

Vol. V Iss 4

Impact of Pests on Stored Cereal Crops in Selected Market Sites of Axum Town, Tigray, Ethiopia

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ARTICLE INFO

Article history:

Received 15 July 16

Received in revised form 05 Aug 16

Accepted 15 Aug 16

Keywords:

Cereal crops,

Impact,

market,

Pests

ABSTRACT

The crop pests are animals that injure (killed) the cultivated plants. This study was aimed to assess the impact of stored cereal crops in two selected market sites of Axum town. A total of 64 respondents, were selected purposively and allowed to interview them using opened and closed ended questionnaires. This study showed that most (45.3%) of respondents found between 30-45 years old and least (7.8% of them found between 57-70 years old, within their sex females (43.7%) and males (56.3%) were participated in this study. The Merchants are losing their stored cereal crops mostly (51.6%) by both insects and Rodents in which they damage these crops but these Merchants are trying to control these pests by using mostly in modern (64%) and least (12.5%) of them by traditional methods. Generally those merchants should be preventing their stored cereal crops by controlling pests more properly using integrated pest management practices.

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How to cite this article: H Areaya, M Kore, H Reddu, and Y Abebe (2016). Impact of Pests on Stored Cereal Crops in Selected Market Sites of Axum Town, Tigray, Ethiopia, International Journal of integrative Sciences, Innovation and Technology (IJIT), 5(4), 15-18.

Introduction

Crop pests are animals that injure or kill cultivated plants and cause disease (David, 2005). Some pests are vertebrates but others are invertebrates. Among vertebrate animals many crop pests are small mammals especially rodents. Among invertebrate animals certain species of gastropod and large number of round worm, from the class of nematodes are harm crops.

The most varied and numerous species of crop pests are arthropods. Insects, mites and crustaceans (Wood lice) of these the most injuries pests are insects, because of their biological characteristics, abundance of species, high fecundity and Rapid reproduction (Dhaliwal, 1996). According to David (2005) these crop pests are considered as the basic factor for reducing the economical, ecological and health of the country. In our country many people mostly depend on the cereal crops

in both rural and urban areas, thus these crops affecting by pests cereal crops are also major stable and cash crops for millions of small holder farmers in the sub-Saharan Africa, even Ethiopia is reach with different crop production, due to most of our life activity depend on productivity, so if the cereal crop affected by these pests our economic development become reduced (Oerke, 2006). In Kenya Maize is the stable food for most household and grown in most agro-ecologies with small holder farmers farming about 70% of growers of commodity (David, 2005). According to David (2005) the insect pest forms the most important biotic constraints to efficient production of cereals in the country. These productions of cereal crops constrained by number of factors which are biotic and a biotic.

Insect pests are forming the most important biotic constraints to efficient production of cereal crops in the country. There are two ways of evaluating the direct effect stem borer damage on crops growth and yields. These are natural and artificial infestation. Natural infestation is

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Peer review under responsibility of IJIT – AGSI Board.



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conducting under field condition, either under research or farmer management (Gray, 1964). Insects and other pests can also destroyed or decrease the value of stored crops and other possession such as cloth, books, paper and other tools. Since insects are adaptable form of life as their total numbers exceed that of any other category. Several insects are predators or other harmful pests and others are pollinators, decomposers of organic matter or producer valuable products like honey, milk less than 0.5% of total numbers of known insect's species are considered as pests. Therefore these pests are controlled by different methods such as Biological, Physical, and Chemical methods (Baessler and Klotz, 2006).

Pests are one of the indicators of health environment and affect the economic development of society, due to lack of knowledge to control and prevent these pests. Although insects play a crucial role in their ecological, social and economic values, they also act as pests which can affect the cereal crops to reduce the economic and health of the environment. Therefore the food production source of urban societies depend on the cereal crop can reduce due to the impact of pest at large. Therefore, this study was aimed to assess the impact of pests on stored cereal crops in selected market sites of Axum town

2. Materials and Methods

2.1 Description of the Study Area

This study was conducted in Axum town of two selected market sites of cereal crop stores. This town is the ancient of historian place which is situated in central administrative zone of Tigray regional national state in the Northern tip of the Ethiopian plateau at 14° 07'N latitude and 38° 44' E longitude of 2100m above sea level. Geographically Aksum is located west of Adwa and East of Wukro Maray, at 1041km distance from Addis Ababa. Regarding to the climatic condition it is conducive for all activities which is "Weynadega" with mean annual temperature ranges between 9.3°C and 29.8°C whereas the mean annual rainfall ranges between 85.8ml and 428ml. The total population growth of Aksum town in 2012/2004 E.C was 56,576 of these population 30,293 were female and 26,283 were males (Gebreaninya Gebru, 2011).

2.2 Sample Size and Sampling Techniques

Sixty four (64) respondents were selected purposively and provide them to interview using questionnaires containing open and closed ended questions about the impact of pests on stored cereal crops in selected market sites of Axum town.

2.3 Data Collection Methods

All the information regarding to the impact of pests on the stored cereal crops were collected using questionnaires. The prepared questionnaires were exposed to the merchants, so as, to interview them one respondent at a time using a local language.

2.4 Data Analysis

Upon the completion of the data collection using questionnaires, tables that contain numbers and percentages were used to represent the data followed by descriptive explanations of each.

3. Results and Discussion

The collected data of the study described by the following two tables that contains the background information of the informants (Table 1) and the response of the questionnaires related to the title of the study (Table 2) respectively.

A total of sixty four (64) merchants were taken from two selected market sites (37 merchants from site one and the rest 27 are selected from the second site) as respondents for this study, and considering their numbers in sex, males (36) and females (28). The majority of the respondents were males in terms of sex. About 45.3% of merchants were found in the age range from 30-45 years old and the least numbers of them are found between 57-70 years old. Comparing with educational status 22(34.4%) informants were illiterates and few of them namely one individual and two individuals were University and college graduated individuals respectively. Most of the respondents were married but only 14.06% are single (Table 1).

Table 1 Background of the informants

Item	Alternative		Responses in	
			Number	Percentage (%)
Personal Information	Sex	Male	36	56.25%
		Female	28	43.75
		Total	64	100.00
	Age	A. 25-29	17	26.56
		B. 30-45	29	45.3125
		C. 46-56	13	20.3125
		D. 57-70	5	7.8125
		Total	64	100.00
	Educational status	A. Illiterate	22	34.375
		B. 1-4	9	14.0625
		C. 5-8	11	17.875
		D. 9-10	13	20.3125
		E. 11-12	6	9.375
		F. College graduates	2	3.125
		G. University graduates	1	1.5625
		Total	64	100.00
	Marital Status	A. Single	9	14.0625
B. Married		55	85.94	
Total		64	100.00	

Source: questionnaire survey, 2015

Table 1 Responses of Informants

S. No	Item	Alternative	Responses in	
			Number	Percentage (%)
1	For how many years are you working in this job?	A. Below 3 years	11	17.1875
		B. Above 3 years	41	64.0625
		C. One year	6	9.375
		D. Two years	6	9.375
		Total	64	100
2	Is there any pest that affects cereal crops in your store?	A. Yes	50	78.125
		B. No	14	21.8705
		Total	64	100
3	Which one of the following pests do you think always affect your cereal crops in your store?	A. Only insect	10	15.625
		B. Only rodents	12	18.75
		C. Both insects and Rodents	33	51.5625
		D. Others	9	14.0625
		Total	64	100
4	How many kg do you think that you loss because of pest per year (month) week?	A. Greater than 5km	16	25
		B. Less than 5kg	18	28.125
		C. Unknown	8	28.125
		D. Others	12	18.75
		Total	64	100
5	Do you think all types of cereal crops in your store equally affected by pests?	A. Yes	16	25
		B. No	48	75
		Total	64	100
6	How do you tried to control those pests in your store? Using:-	A. Modern methods	41	64.0625
		B. Traditional methods	8	12.5
		C. Both	2	3.125
		D. Others	13	20.3125
		Total	64	100
Total			64	100

Source: questionnaire survey, 2015

Most of the merchants were experienced this job for the time duration above 3 years (64%) and few of them were having experience of 1 and 2 years (9%). 50 (78.2%) respondents respond that, the cereal crops in the storage were frequently affected by pests. Both rodents and Insects (Weevils) were the most important pests in the study area having 51.6% in causing damage on cereal crops in the stores (Table 2).

There were also other pests (14%) affecting the cereal crop stored such as birds and other factors like expired dates of crop using in the study area. Most (28%) of the merchants loss their crops less than 5kg per month and individuals which have equal number with this merchants do not know how many crops were loosed due to the impact of pests on their stored cereal crops. The most (75%) cereal crops in the store of respondents do not equally affected by pests due to the nature of their size small (Teff) which is difficult to rodents to crash and uncomfortable for weevil to enter into the body of Teff to affect it. Similarly Degussa was also difficult to be affected by rodents and weevils because of its hard cover to crash and inject to enter in to the body of seed. According to 25% of respondents estimated that all cereal crops cannot be equally affected by pests. This may be due to the variation of the cereal crops they have different thicknesses in their cover such as Barley, maize and wheat are easily affected by pests. These crops are most comfortable for rodent to crash and easy for weevil to enter inside the body of seeds and takes place their life cycle. More than 64% of responds were used modern techniques (poison chemicals like DDT, cephothiazine and traps) to control pests that affect their cereal crops and very few (3%) of them applies both

modern and Traditional (arrangement techniques and tsebel based on their believes) ways of pest control methods. 27 % of the merchants were used some chemical (drugs) which affect insects nervous system without more toxic to the crops and contain more ingredient than other chemicals called cephothiazine insecticides. The respondents indicate that all those control methods vary in their killing ability of pests due to their strength in their toxicity.

Other methods like traps used to control rodents were also practiced by merchants of the selected market sites of the town. These methods were practiced without adding any chemical which may affect the user of crops and other organisms rather than foods to attract the rodents towards the trap. Generally the modern methods easily destroy the pests by using small chemical for many pests in a short period of time but not easily available.

Conclusion and Recommendations

Pests are animals that affect or destroy cultivated plants. The result of this study indicates pest affect stored cereal crops in the market sites of Axum town that able to reduce the profit of the merchants. There is a variation on the impact of pests on cereal crops i.e. some of the cereal crops were highly affected by pests as compare to the other cereal crops. Modern and traditional pest control methods were also greatly practiced against pests in the study areas. The government has to help the merchants in providing pesticides by medium cost and giving comfortable place for crop storage. Further study and investigation in

this study area by focusing on resistance of the pests that affect the cereal crops should be exercised and Merchants should use nontoxic chemicals so as to prevent themselves from damage.

Acknowledgments

First we thank for respondents who were actively participated in responding the questionnaires accordingly. We also thank for those who contribute their comments to strengthen this research article. Finally we thank the Department of Biology, College of Natural and Computational Sciences for helping us in printing and stationary materials.

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ISSN 2278-1145



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