

Assessment of Insect Pest and Their Damage Level on Crops in Oromia, West Shoa Zone, Ethiopia

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ABSTRACT

Insect pest of crop is one of the most damaging plant parts and yields. Insect pests cause enormous loss to litchi through direct and indirect invasion on various plant parts. The study was conducted during the month of April to June 2019 in Goda Galan kebele. The aim of study was to differentiate the key insect pest, to estimate the economic loss of this insect pest and to identify the types of control measures in study area. Data was collected by using observation of farmers' farm land, by interviewing farmers and village extension workers and by reviewing recorded document from office of agricultural of the study sites. The researcher was carried out on the selected 84 households. The finding indicates that the major key insect pest in study area were armyworm, steam borer and grasshopper. The yield loss due to key insect pest different was based on types of crops. On corn yield lost was due to armyworm and steam borer was 2-6Qu per hectare. Behind to this the way to farmers' control those insect pest of crops were chemical methods and cultural methods like crop rotation, sanitation early crops and removing debris. It is recommended that integrated pest management approach should be introduced in the study area to control key insect pest.

Keywords: assessment, insect pest, crops damage, economic losses

INTRODUCTION

Insects are the most diverse species of animals living on earth. Insect pests cause enormous loss to litchi through direct and indirect invasion on various plant parts. Insects are organisms considered as the significant and primary pests of stored products that present damage to the grains through direct feeding during some of their lifecycles; resulting large populations and considerable damages (Rees, 1990). The higher level of insect infestation, and the associated percentage grain damage, weight loss and germination loss that occurred in all of farmers traditional storages methods in the present study also confirmed that the quantity, quality, resources, labor and income, and food security of poor farmers is affected (Berhanu & Emanu, 2018).

In farming, an insect may be classified as a pest if the damage it causes to a crop or livestock is sufficient to reduce the yield and/or quality of the 'harvested product' by an amount that is unacceptable to the farmer. Apart from the open ocean, insects can be found in all habitats; swamps, jungles, deserts, even in highly harsh environments such as pools of crude petroleum (Gullan & Cranston, 2014). Insects are undoubtedly the most adaptable form of life as their total numbers far exceed that of any other animal category.

The status of any given pest (major or minor) depends largely on how often and in what numbers it occurs, as well as the economics of managing the pest. Factors that contribute to choices about insect management

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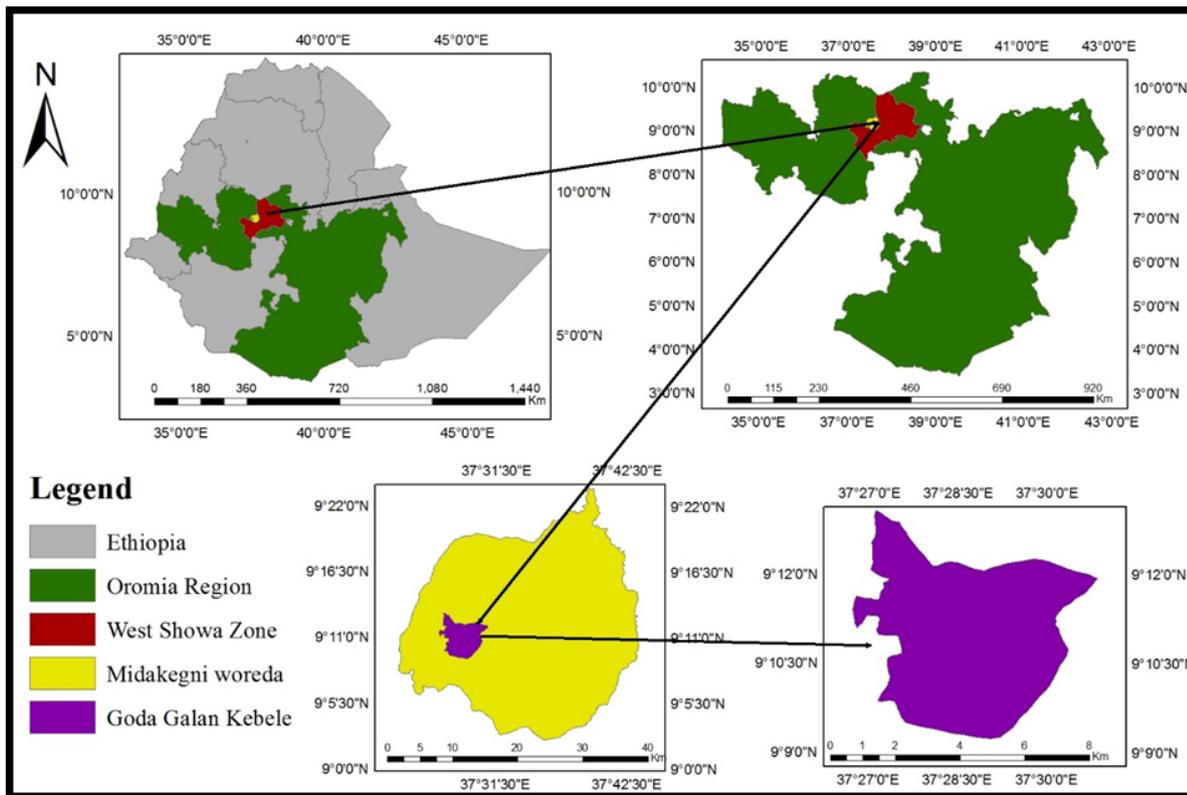


Figure 1. Map of study area

include the market value of the crop, the cost of controlling the pest relative to its potential for causing crop loss, the susceptibility of the crop to the pest, and the environment, all of which are variable. Consequently, effectively managing insect pests of field crops requires considerable knowledge about the pests and the factors that affect their populations. Insect pests inflict damage to humans, farm animals and crops. Insect pests have been defined by (Williams, 1947) as any insect in the wrong place. Depending on the structure of the ecosystem in a given area and man's view point, a certain insect might or might not be considered a pest.

One major reason why there are pests is the creation of manipulated habitats, that is, agro-ecosystems that fulfill man's needs, where crops are selected for their large size, high yield, nutritious value, and clustered in a confined area. This does not only satisfy man's demand, but provides a highly conducive environment for herbivorous insects at the same time. There are different types of insect pest in different parts of the world. Insect pest has been growing problem in Ethiopia which needs clearly controlling mechanism and assessing their damage level. Thus, assessing the insect pests and their damage level is important for to secure the crops.

MATERIAL AND METHODS

Description of the Study Site

This study was conducted on Midakagn district in West Shoa zone in Oromia regional state particularly in Goda Galan Kebele. The study area is located at 232 km away from Addis Ababa the capital city of Ethiopia, and 107 km from the zonal capital Ambo town. The altitude of the area range from 1450-1850 meter above sea level. The annual rain fall of the Woreda ranges from 800-1000mm and the temperature 23°C by average.

Farmers Activities

Farmers in the district were participating staple cereal crops production. These crops include corn, sorghum, pepper and Teff. The major food and cash crops grown in the area include field crops like millet, wheat, maize and, pea and bean.

Table 1. Major crop grown in the area

Item	Response	No of Respondents	Percentage (%)
1. Which crop is mainly cultivated at your local site?	Corn	28	33.33%
	Sorghum	10	11.9%
	Teff	21	25%
	Wheat	25	29.77%
	Total Respondents	84	100%

Table 2. Stage and season of crop damage by insect pests

Item	Response	No of Respondents	Percentage (%)
2. At what stage your crop damaged by insect pest?	Before harvest	54	64.28
	After harvest	21	25
	During harvest	9	10.72
	Total	84	100
3. At what season insect pest affects your crop more?	During Summer	31	36.9%
	During Winter	7	8.33%
	During Autumn	25	29.77%
	During Spring	21	25%
	Total	84	100%

Table 3. The main key insect pest in the study area

Item	Response	No of Respondents	Percentage (%)
4. Is there insect pest that cause crop damage in your area?	Yes	84	100%
	No	0	0
	Total	84	100%
5. Which pest affects your crops seriously?	Armyworm	25	29.77%
	Steam borer	33	39.28%
	Grasshopper	20	23.81%
	Other Termite, Aphid	6	7.14%
	Total	84	100%
6. Did you use pesticide for your damage?	Yes	63	75%
	No	21	25%
	Total	84	100%

Study Design

The research design was descriptive as Kothari (2004), states that descriptive research is concerns with describing the characteristics of a particular object or phenomena. The research design was also survey design. Where survey is type of design which taken in to account the entire steps involved in a survey concerning a phenomenon were studied.

Primary Data: Primary data refers to information collected for the first time. Primary data was collected by employing data collection techniques like Questioner, key informant interview and observation.

RESULT AND DISCUSSION

Crops Grown at Study Site

The most of the people in the study area were grown Corn 28 (33.33%) which followed by wheat 25(29.77) (Table 1).

Stage and Season of Crop Damage

Based on the analyzed result, high amount of crops were damaged before harvest 54 (64.28%) and during summer 31 (36.9%).

Types of Pests and Usage of Insecticides at the Study Site

As shown in Table 3, of respondents said that Steam borer (33(39.28%) is the main insect that damage crops in the study area. On the other hand, Termite and Aphids is the least insect pest that damages their crops in the area. This insect distribution is confirmed with similar study so far conducted (Grisley, 1993).

Table 4. Type of crop loss and insect type

Item	Type of insect cause crop loss	Type of crop loss	Yield loss		No of Respondents	Percentage (%)		
			Yield loss by quintal per hecter.	Yield loss by ET- birr				
Is there economic loss by pest problem? How much estimated?	Armyworm Steam borer	Corn	1-2Qu	800-1600	45	53.57%		
			2-4 Qu.	1600-2400	20	23.81%		
			4-6 Qu.	2400-4000	19	22.62%		
			>6Qu	>4000	0	0%		
			Total		84	100%		
	Grasshopper	Wheat	1-2Qu	1400-2800	26	30.95%		
			2-4 Qu.	2800-5200	37	44.05%		
			4-6 Qu.	5200-8400	21	25%		
			>6Qu	>8400	0%	0%		
			Total		84	100%		
			Armyworm Steam borer	Sorghum	1-2 Qu	1200--3000	27	28.7%
					2-4 Qu	3000--6000	22	26.2%
4-6 Qu	6000-8000	35			45.1%			
>6Qu	>8000	0%			0%			
Total		84	100					

Table 5. Control Method of insect Pest in study area

Item	Response	No of Respondents	Percentage (%)
What control methods you use for these pests?	Crop Rotation	32	38.1%
	Sanitation	19	22.62%
	Chemical use	22	26.2
	Early cropping	11	13.08%
	Total	84	100%

Level of Yield Loss by Local Insects

53.57% respondent said that 1-6 quintal of corn was loosed due to insect pest per hecter. This finding is related with the report of (Youdeowei, 1989) observed stem borer and army worm as a serious pest (**Table 4**).

Management Practice to Control Insects

Most of farmers 32 (38.1%) were use crop rotation mechanism to control insect pests from their crop grown followed by chemical method 22 (26.2%) while 19 (22.62%) of respondents were use Sanitation method to control key insect pest. In the other hand some respondents 11 (13.08%) of respondents were use early cropping method for their crop grown on field. This finding is in line with the investigation of (Tefera et al., 2011) to control insect pest various control mechanisms have been evaluated including chemical, cultural, host plant resistance and biological in different parts of Africa.

CONCLUSION

From this study, Armyworm, Steam borer, and Grass hopper were the main key insect pest in the study area. Most of the crops were damaged by pests before harvesting at summer and autumn seasons.

Disclosure statement

No potential conflict of interest was reported by the authors.

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