

SHORT COMMUNICATION

Participatory Analysis of Welo Bush Cricket (*Decticoidea brevipennis*) Problem in Wag-Himra Zone

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Abstract

Participatory rural appraisal on Welo bush cricket (*Decticoidea brevipennis* Ragge.) was conducted during August 19 to 23, 1997 in Wag-Himra administrative zone. The main objective was to provide information on Welo bush cricket status and control methods with system perspective. One hundred four farmers identified Welo bush cricket locally called "Degeza" as one of the major constraints to increasing agricultural productivity. Most farmers are aware that Welo bush cricket is found in bushy and weedy areas around and inside the cereal crops (tef, barley and wheat) fields. Welo bush cricket control measures practiced in the area are conventional insecticides, cultural, mechanical, botanical and biological control.

Introduction

Tef, barley, wheat, and sorghum are the major food crops in the surveyed areas. However, Welo bush cricket (*Decticoidea brevipennis* Ragge) threatens the production of these food crops. The yield loss caused by Welo bush cricket was estimated between 15 and 35% (Bayeh and Tsedeke 1995). Every year since 1974 peasants in parts of the highlands of Ethiopia, especially in Welo region including Wag, Lasta, Wadla Delanta, Warehimanu, Waraillu and Borena (Crowe 1974) have complained that their ripening cereals were being attacked by a flightless bush cricket locally known as "Degeza". It was also recorded in North Shewa, East Gojam, South Gondor, Welo and Tigray (Jaggo 1977; Stretch et al. 1979).

Due to its severe incidence, it can cause very serious damage to the milky grains as well as matured grains of cereals. The pest is extremely damaging and starts feeding during the hottest part of the day. It is usually found in borders, uncultivated bush and/or weedy lands that provide it with alternate food source and hiding place during early morning until the temperature increased. The late instar nymphs and adults damage cultivated crops; early instar nymphs predominantly feed on weeds. Farmers have a role in problem identification, determination of

causes, evaluation of potential solutions and in the development and implementation of a research master plan (Chambers et al. 1989; Tripp and Wooley 1989; Ashby 1990). Therefore, a starting point of research on Welo bush cricket control strategies is to understand the farmers present management practices, identify problems, their causes, potential solutions and set priorities for future research work that solve the problems. The incidence of Welo bush cricket is strongly influenced by many aspects of farming systems/practices, which include cropping practices and systems, which are also influenced by the way, in which production systems are evolving. To obtain information on the status of Welo bush cricket problem, its major hosts and alternate hosts, farmers' attitudes and control methods a participatory rural appraisal was conducted in wag administrative zone.

Materials and Methods

An informal survey was conducted from August 19 to 23, 1997 by team that consisted of an entomologist, pathologist and agro-economist from Sirinka Agricultural Research Center and extension experts from respective woredas.

The staff worked in groups to make the survey work interdisciplinary and to have common recognition and professional balance. The informal survey was conducted using PRA techniques for group discussion with farmers. A checklist previously prepared by the research scientists guided the discussion. The issues addressed in the checklist were land ownership, crop production, soil fertility/agroforestry, livestock production and general socio-economics of Welo bush cricket problem in the area. The secondary data were reviewed before the field survey in order to base discussion with farmers and identify information gaps. The discussion was attended by 104 farmers of whom seven were women. The farmers participated in the group discussions were from Netsa work (Zequala Woreda) and Bela, Wolch and Hamusit (Sekota Woreda) peasant associations.

Results and Discussion

Major insect pests

The farmers well recognized about 9 major insect pests in the surveyed area. These are Welo bush cricket "Degeza", aphids, shoot fly, weevil, armyworm, ants, beetles, grasshoppers and stalk borers (Table 1). The most problematic insect pests

according to the farmer's pair wise ranking were "Degeza", aphids, weevils, armyworm and shoot fly in order of their importance (Tables 2 & 3).

The types of crops attacked by Welo bush cricket in the surveyed area are tef, barley, wheat and field pea rarely. Pest infestation and distribution is not the same to all crops, for instance, tef fields are affected by Welo bush cricket starting from flowering up to harvesting and the insect could damage all the farms within a short time. Whereas in barley and wheat fields, the infestation starts from booting stage, but after the crop reaches fully matured stage, the seed becomes hard, the insect couldn't attack it. Welo bush cricket is the most serious insect pest on tef, barley and wheat. According to farmers, the proportion of farmland infested by Welo bush cricket can reach up to 25 to 50 %.

Host plants of Welo bush cricket

The main crops attacked by the insect include tef, barley, wheat, sorghum and to some extent finger millet (Table 1). Welo bush cricket attacks different wild grasses (*Andropogon spp.*, *Snowdenia spp.* and *Cynodon spp.*) and Meskel daisies until cereal crops reach milky stage.

Table 1. Major insect pests with their hosts in Zequala and Sekota Woredas

Major insect pests	Host Crops
Welo bush cricket (<i>Decticoidea brevipennis</i>)	sorghum, tef, barley, wheat and finger millet.
aphids (<i>Diuraphis noxia</i>)	field pea, barley and lentil.
grass hopper	tef, barley, wheat, haricot bean and field pea.
army worm	sorghum, barley, finger millet, tef, wheat & grazing lands.
barley shoot fly (<i>Delia arambourgia</i>)	barley and tef
stalk borer (<i>Busseola fusca</i> (Fuller))	sorghum and maize

Table 2. Major insect pests in Zequala area.

Degeza (D)	Weevils (W)	Aphid (A)	Beetles (B)	Stalk borer (SB)	Ants (AN)	Shoot fly (SF)		Score	Rank
---	D	D	D	D	D	D	degeza	6	A
	---	A	W	W	W	W	weevils	4	C
		---	A	A	A	A	aphid	5	B
			---	B	B	B	beetles	3	D
				---	AN	SF	stalk borer	0	G
					---	SF	ants	1	F
						---	shoot fly	2	E

Table 3. Major insect pests in Sekota area

Degeza (D)	Army worm (AW)	Ants (AN)	Aphid (A)	Shoot fly (SF)	Weevils (W)	Beetles (B)	Grass hopper (GH)		Score	Rank
---	D	D	D	D	D	D	D	degeza	7	A
	---	AW	A	AW	AW	AW	AW	army worm	5	C
		--	A	SF	W	B	GH	ants	0	H
			--	A	A	A	A	aphid	6	B
				--	W	B	SF	shoot fly	2	F
					--	W	W	weevils	4	D
						--	B	beetles	3	E
							--	grass hopper	1	G

Historical profile

Farmers indicated that grasshoppers and armyworm appeared in 1966 and 1967, respectively. Welo bush cricket started to appear around 1972 within a small plot of land but not as important insect pest in agriculture. Since 1977, the insect started to attack crops and the infestation increased from year to year. The farmers had started to control Welo bush cricket using insecticide but it was not of agricultural importance before 1987.

Seasonal variation of Welo bush cricket incidence

The farmers perceived that if the area gets rain early in March and April, Welo bush cricket population pressure increases and appears early but if the rainfall is late the population pressure becomes low and the infestation comes late. The degree of incidence of Welo bush cricket becomes very high at early and mid instar than late instar. The

insect becomes active and moves by jumping in the day time and affects large areas within a short time. But in early morning and cool weather condition, the insect becomes inactive.

Farmers' Control Measures

Most farmers indicated that they used broad-spectrum insecticides supplied by zonal department of Agriculture. Traditional control measures are also practiced to reduce Welo bush cricket infestation. Some farmers used animal substances, ashes and biological control measures. Moreover, Welo bush cricket infestation can be reduced using chickpea boundary planting and resistant local cultivars.

Some of the well-known cultural control measures practiced by most farmers to reduce Degeza infestation as well as crop damage are slashing of weeds in field margins, early planting, maintaining of clear field margin where no vegetation grows, deep and frequent ploughing to expose the eggs to sunlight and predators, use of appropriate cropping patterns, use of resistant/tolerant varieties, growing trap/border crops (e.g. chickpea), flogging and digging ditches in the field.

Farmers use different broad-spectrum insecticides (Malathion 50% E.C., Fenitrothion 50% E.C., DDT and Carbaryl 85% WP) which are supplied by Bureau of Agriculture (BOA) and NGO's. If there is shortage of insecticides and labor to practice mechanical control, the farmers use chicken as biological control agent around homestead and fermented cow urine, sisal extracts and ashes as natural pesticides.

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