Perception and Control of the Fall Armyworm and its Impacts on Livelihoods in Eastern Africa

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Abstract

Since 2016, the invasive species *Spodeptera frugiperda* (Fall Armyworm) has ravished though Africa causing substantial damage to cereal crops. Since their arrival they have been reported in over 30 African countries and are majorly affecting the livelihoods of subsistence farmers. Because of the recent invasion, farmers are coming closer to the point of food insecurity. My task was to find out how much local farmers knew, how much they were losing, and how that was affecting their livelihoods. I also examined the perceptions on the effectivity of the control methods the farmers were using and disseminated knowledge.

By compiling a four-page questionnaire I was able to compare famer's yields, knowledge, control methods, and social standards. I cross tabulated factors such as country locale and if the participant was a push pull farmer or not. With the help of my mentors and translators, I administered my questionnaires and received information specific to each farmer. I conducted one focus group where I gathered information on yield loss since the arrival of the Fall Armyworm and their general knowledge of the pest.

In the research I conducted, I gathered and compiled ideas of farmers from all around, finding that a majority of our respondents used chemical control even though it is very expensive. The reason for this was the level of effectivity compared to other methods such as ash or detergent. Knowledge and information of the Fall Armyworm is disseminated mostly from villager to villager or through radio broadcasts and about 60% of farmers are losing more than half of their yield every harvest due to Fall Army Worm. We asked many farmers where these pests could have come from to test their knowledge and found out that they had many wild stories and that the dissemination of correct knowledge can insure better harvests for farmers.

Objective

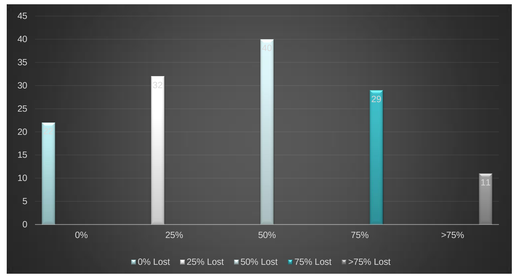
The goal of my research consisted of understanding how the livelihoods of East Africans was being affected due to the recent Fall Armyworm outbreak. On top of that, I was to gather information about the farmers yield loss and perception, so information on the Fall Armyworm and push pull could be more easily disseminated to local farmers. During my interviewing process I was to help disseminate knowledge to the participants in hopes to answer some of their questions about this new pest. I categorized my findings into 5 sections of farmer perception, yield loss, farmers knowledge, farmers livelihoods, and methods of control.

Introduction

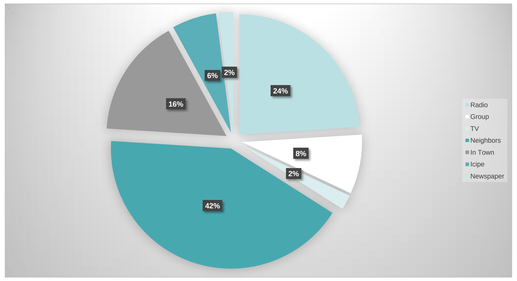
Fall Armyworm has become a huge agricultural problem in Africa. With no natural predators and their main source of food easily accessible they are destroying the livelihoods of small share farmers all over the continent. Because no specific control for this pest exists, farmers have resulted to trying anything to stop any further damage by this pest. Desperately farmers have been searching for a control method but to no avail. Pesticides that currently exist are very expensive and are out of reach of most subsistence farmers. In its home continent of South America, Fall Armyworm is controlled by a combination of pesticides and genetically modified crops that can be ecologically damaging. Genetically modified crops have yet to be approved for use in Kenya or Tanzania, so this option is not viable currently. However, in research done by senior scientists of push pull they reported that push pull is an adequate control for stemborer, striga and now Fall Army Worm. Farmers have turned to picking off the worms and burying them as a control method and some have given up and view any control as futile. If an adequate control method is not found, farmers could adapt to the lesser of these two cases causing widespread famine and poverty throughout Africa. Every farmer had ideas of government programs that could be implemented and enforced to prevent hardship to smallholder farmers, so all hope is not lost yet.

Results

Percent of Yield Lost



Methods of Disseminating Knowledge



Effectiveness of Control Methods

METHOD	Y1	Y2	Y3	N1	N2	TOTAL
CHEMICAL	6	16	8	2	2	34
PUSH PULL	2	7	5	0	0	14
ASH	1	2	3	2	2	10
HERBAL	0	0	1	1	1	3
SHAKE AND BURRY	0	1	0	2	0	2
SOAP	0	0	1	1	0	2
STAB	0	0	0	2	0	2
PULL UP CROP	1	0	0	0	0	1
NOTHING	1	0	0	0	0	1

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Conclusion

Farming in rural Africa can be a challenge in itself but when other barriers stand in the way such as drought, infertile soil, and pests, even surviving can become difficult. Farmers will do anything possible to save their crops from the dangers mother nature has to offer. Control methods I observed showed that participants were willing to try anything from stabbing the worms as they saw them, to dousing their whole fields in dangerous pesticides. A majority of farmers had little to no knowledge on this pest and their control methods reflected that. This invasive species is on average destroying almost fifty percent of farmers crops a year pushing them closer and closer to food insecurity. If something isn't done to stop the Fall Army Worm, subsistence farmers in Africa may not be able to provide for their families in years to come.

Methodology

All of my respondents were chosen with some regard to age, gender, push pull, and location, however the . To collect and organize data, I formed a questionnaire that was administered to each of my 50 participants..

After the individual questionnaire process was finished I conducted a focus group to compile ideas as a group and complement the individual results. This group, unlike my original sample, was equal in both gender, push pull and non-push pull farmers. To create my focus group questions, I compiled questions from the individual questionnaire. To collect data, I created a questionnaire by forming broad questions. After creating my general questions, I began to formulate easier yes, no and simple short answer questions that could help answer the broader points. After my draft was created, we briefly reviewed the questionnaire for topographical errors and tested it on five random participants. Once the trial run was finished I continued to edit my questionnaire to create less complex and easier to answer questions. My questionnaire was then put through a final review and test run to create my final product that was used throughout the rest of the process. I then compiled a list of questions for a focus group to gather a collective response to complement my individual interviews and spark a discussion.

To administer my questionnaire, we traveled to 6 different counties, three in Kenya and three in Tanzania, to meet groups of farmers where with the help of my translators we collected information. Before beginning questionnaires, we made sure that every farmer knew that there were no right or wrong answers, so we could avoid any obscured data. Once finished the 50 questionnaires were entered into a statistical analysis program, Statistical Package for Social Sciences (SPSS). After entry and coding, data was arranged to answer various questions and determine statistical data. Data was then averaged and turned into an equal percent value to compare unequal values.