JoMUN XV

Forum: Economic and Social Council (ECOSOC)

Issue: Assessing and minimizing the harmful effects of pests on Southern African crops

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INTRODUCTION

Crops in Africa play a significant role in Africa as millions of African populations depend on them as their primary food source. In South Africa, crops occupy more than 60% of hectare of its land, which emphasizes that crops are essential for residents in the country. However, since early February 2017, massive amounts of fields of maize and staple crops have been invaded by armyworms consequently affecting the countries' economies. Affected regions include: South Africa, Zimbabwe, Malawi, and Zambia. Crops affected by armyworms range from sorghum, and soybeans, up until groundnuts, and potatoes. According to DAFF (The Department of Agriculture, Forestry and Fisheries), "little is known on how this particular pest entered Southern Africa". Currently, armyworms have been spreading rapidly throughout Southern Africa and it is irrefutable that eradicating this pest is almost impossible - one of the reasons being that they are able to lay up to 2000 eggs.

These troops of armyworms destroy crops by eating the leaves and the reproductive parts of the plant, which means that they damage the maize cob as a whole. Consequently, destruction of crops may lead to a country's economic crisis. As the number of healthy crops become more scarce, the price of these crops possibly will increase which, therefore, pressures customers – especially the poor population. The harmful impacts of pests have forced experts in this field to call upon an emergency meeting of 16 African nations. For further development of Africa and for Africa's economy to expand, it is imperative that immediate solutions are established.

DEFINITION OF KEY TERMS

Armyworms

Pests that have life cycles of 24 to 40 days. These pests are known as worms that can lay approximately 50 eggs in a single location which consequently leads to rapid colonization and destruction of maize and staple crop territory. They are also able to migrate large distances.

IPM

An acronym that stands for Integrated Pest Management. IPM is a wide approach that integrates actions for controlling pests that degrade economic productivity. IPM's main goal is to reduce the pest population below the EIL (Economic Injury Level).

Maize

Most widely grown staple crop in Africa. Over 300 million people in Africa depends on this as it is their main food source.

WFP

An acronym that stands for United Nations World Food Programme. WFP is a UN-branched humanitarian organization that aims to promote food security and eradicate hunger.

FAO

An acronym that stands for Food and Agricultural Organization. FAO is a neutral organization where nations meet equally and negotiate policies and other issues pertaining to food supply. Its main goal is to eradicate hunger.

FAW

Fall armyworm. They are caterpillars that mainly attack maize crops, eating up all the food supply in a certain area. Once the maize gets exhausted, these FAW move on to another destination where they can find new food supply.

Pesticides

Chemical materials that are used to kill pests, including rodents, insects, and unwanted plants.

Microbes

Tiny organisms that interact with soils and plants. Although these microbes are yet to be appreciated in Africa, this organism has an effect of improving plant growth and protecting plants from being attacked by pests.

BACKGROUND ON THE ISSUE

WFP stated that in Zimbabwe, "Over four million people, or a third of the population, are in dire need of assistance" due to food shortages. Because of this, the Zimbabwean government began using pesticides more than before. However, it is very difficult to control pests with only one type of pesticide.

In Zambia, approximately 124,000 hectares of crops have been destroyed because of armyworms. In Namibia and Malawi, there have been 2000 hectares worth of maize destruction.

According to the FAO Sub-regional Coordinator for Southern Africa, Dr Chimimba David Phiri, any outbreaks can have a devastating impact on a country's food security. He also added that if pests interfere the sugar plantations in Zimbabwe, economically devastating problems will arise inevitably. A lot of Southern African countries have managed to develop into MICs (middle income country). Thus, continuous pest crisis will harm the continuously increasing economic growth in these countries.

The armyworms were found in Nigeria and Togo at first. After, it has been predicted that they have spread very rapidly to Southern Africa. An entomologist at the International Institute of Tropical Agriculture, Georg Goergen predicted that the next destination of these pests will be Kenya and Tanzania, and these pests will spread from Southern Africa to the Northern part of the continent.

These armyworms are significantly threatening to farming due to many reasons. First of all, they are very hungry, and when these armyworms do invade the maize, up to three quarters of the crop can be destroyed. Also, these worms are unknown enemies. The African governments, communities, and farmers are not familiar with these worms since they have no previous experiences of dealing with these new pests (so it is harder for them to deal with them). Another reason is that armyworms are fast. According to the FAO, it only took 8 weeks for the armyworms to spread to 6 different Southern African countries where there are suspected infestations. Not only that, but they travel very far and can be widespread. Also, unfortunately, these worms do not target old crops as they have only been identified in maize with primary food staple. The difficult part about minimizing the armyworms is that they are very hard to find as they burrow into the stem of the maize plants. They hide inside the

plants where they are invisible. Lastly, they come after two years of record droughts that has already affected more than 40 million people in Southern Africa, consequently resulting in 15% of the food loss, which is a very bad timing.

The FAO stated that over 40 million people in Southern Africa are in need of food assistance before March 2018, when the next harvest starts.

According to May- Guri Saethre, a researcher from NIBIO (Norwegian Institute of Bioeconomy), as short- term measures to resolve the problem did not bring huge success, she recommended that long- term control measures are more appropriate in this case. This is to map out which natural enemies (pests) the species have in its's original areas. As pests are fairly new in Africa, it is important to still evaluate them while searching for solutions. Saethre added that normally, it takes years to obtain knowledge of pest control measures. So benefits in this case are such that species are identified, and that there is already some knowledge available concerning the biology of the moth and also the natural enemies.

MAJOR COUNTRIES AND ORGANIZATIONS INVOLVED

South Africa

South Africa is the biggest maize producer in Southern Africa, and is currently being attacked by FAWs. Unfortunately, the pesticides cost a lot to eradicate - approximately R200-600 per hectare – thus difficult to eradicate.

Zambia

321,236 acres of land have been destructed in Zambia due to the attacks of armyworm. In Zambia, 70% of its maize is produced and stored by small farmers, using a traditional storage method. Zambia's goal is to develop an Integrated Pest and Commodity Management Strategy in order to help small to medium scale farmers in order to suppress pest population.

Zimbabwe

Zimbabwe is fighting an outbreak of armyworms which is causing a massive damage on maize in Zimbabwe that has consequently led to drought in 2016.

FAO

U.N. Food and Agriculture Organization. FAO has hold an emergency regional meeting in Zimbabwe on the topic of the invasion of armyworm. The aim of the meeting is to find strategies to overcome the devastating situation.

DAFF

An acronym for Department of Agriculture, Forestry and Fisheries. Almost every countries have their own DAFF. DAFF is responsible for upkeeping with providing the country's population with sufficient and safe nutritious food.

TIMELINE OF KEY EVENTS

1957	Start of the armyworm invasion in the Americas. They have not been managed to eradicate the pests because of their ridiculous rate of evolution.

1993	LGB (Larger Grain Borer) restricted to the Nakonde District of Northern Province bordering Tanzania was reported in Zambia.
1995	Significant amount of LGB- infested crops imported from Tanzania to Zambia in order to offset a crop shortage because of three years of drought.
January 2016	Presence of fall armyworm reported on the island nation of Sao Tome and Principle for the first time.
December 2016	Zambia deploys the national air force to control the outbreak.
January 2017	DAFF met with role players of industries to regulate a plan of action for the devastating effect of pests on Southern African crops. Interim control program presented to industry members.

RELEVANT UN RESOLUTIONS, TREATIES, AND EVENTS

In the past, the Food and Agricultural Organization of the United Nations and the convention on Persistent Organic Pollutants worked together to decrease the abundance of harmful pesticides. They have also installed a Clean Sweep program (a program that serves appropriate clean-up and disposal of these pesticides). Another UN action is that they created control options for small to medium- scale farmers. They have strongly recommended farmers that use more developed storage spaces such as brick bin, cement- plastered basket, etc, to use chemicals in order to protect crops.

PREVIOUS ATTEMPTS TO SOLVE THE ISSUE

Rhizobacteria (PGPR)

Researchers at Auburn University have studied and worked on the beneficial microbes that are plant growth-promoting, called rhizobacteria (PGPR). These soil- dwelling bacteria colonize plant roots which consequently benefit the plants as they increase the rate of plant growth and enhance capability of plants to fight against pests such as armyworms.

Integrated Pest Management (IPM)

The use of IPM (Integrated Pest Management) as it aims to minimize the use of chemicals (pesticides) which will also decrease the effect of pesticides contributing towards environmental damage.

Education

FAO has tried to inform governments that monitor and surveillance are crucial. Even if there is no threat, there might be signs of pests coming out. The Director of FAO's Social Policies and Rural Institutions Division Rob Vos emphasized the importance of investing in agricultural monitoring and research for immediate respond to pest threats. Also, in the 2017 FAO report, "The Future of Food and Agriculture: Trends and Challenges," they have highlighted that it is crucial that investment is needed to support private investment.

DAFF

The Department of Agriculture, Forestry and Fisheries (DAFF) already met with several countries and research organisations in January 2017 to figure out a plan of action. The DAFF worked on the identification of the pest, and once identified, they worked on implementing the emergency control strategy. DAFF also collaborated with the main producers of crops (Southern African regions) to develop an awareness program and an interim control. FAW is resistant to some pyrethroids (insecticides), therefore, emergency registration of agricultural chemicals is crucial to suppress the pest population. It is irrefutable that since “maize plants mature as the caterpillars feed inside the leaf whorl outside the reach of pesticides”, this specific pest is difficult to control and to eradicate. The interim control program (type of pest control program) was presented in order to improve this issue.

Peter Lungu, the head of the technical services at Zambia’s Ministry of Agriculture stated that currently "a number of government agencies and departments are collaborating and we have disaster management units providing chemicals and safety materials." Intensive surveillance is still ongoing.

Cultivars and crop sequences

Using cultivars and crop sequences (cultural practices) that will help prevent the pests.

Pest Forecasting Techniques

Plant disease forecasting is a management system that is used to predict the change in severity or occurrence of plant diseases. Usually, recommendations are made whether disease treatment is necessary or not in a certain situation. Usual pest forecasting techniques id a pesticide application. In addition, as computing power increases globally, disease forecasting systems will be more useful

POSSIBLE SOLUTIONS

such as it will become increasingly important with climate change and make more accurate predictions of where disease outbreaks may possibly occur as they might not be in the areas where it is not historically known for pests.

Equipment Standards

Assuring equipment that are used for handling agrochemicals have established safety and reach the maintenance standards.

Accurate Records

Maintenance of accurate records using agrochemical- that is, a chemical used in agriculture (e.g. pesticides, fertilizers). Regular check-ups of balance status between pests and crops using agrochemicals is essential as using agrochemicals may damage crops. Recording the number of crops damaged and pests killed through the use of this chemical will help determine the future use of the amount of pesticides. Using agrochemicals that matches the legal requirements such as registration for individual crops, timings, and rate will be vital to help secure crops in Africa.

Integrated Pest Management

Adapting Integrated Pest Management IPM strategies that include proper identification of problems, sampling to determine the extent of the problem, analysis to assess the problems’ importance, selection of appropriate management alternative, proper implementation of management action, and evaluation of effectiveness of management action. In the selection of appropriate management alternative strategy, examples of management tactics include: biological (parasites, predators,

pests), chemical (pesticides, pheromones), cultural (planting date, fertility, plant populations, sanitation), mechanical (cultivation, traps, fence), an physical (rain, solar radiation).

Rob Vos, the Director of FAO's Social Policies and Rural Institutions Division have stated that "successful management of recurrent and new threats, such as FAW, is likely to be best achieved through collaboration among governments and international and national organizations".

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