IPM IL Trip Report

Country Visited: Ethiopia

Dates of Travel: 16-20 December 2018

Travelers' Names and Affiliations:

1. Dr Richard Molo, National Agricultural Research Organization (NARO), Uganda
2. Mr Solomon Okuta, National Agricultural Research Organization (NARO), Uganda

Purpose of Trip: Workshop on Biological Control of Parthenium

Specific objectives of the trip were to:

i) To provide update on status of biological control of Parthenium in Uganda

ii) To get training on mass rearing and release techniques for biocontrol agents of Parthenium

iii) To interact with scientists working on biological control of Parthenium

Sites Visited:

1. Wollenchiti
2. Ambo University
3. Awash Melkasa Agricultural Research Centre

Description of Activities/Observations:

United States Agency for International Development (USAID) through IPM-IL project in Uganda facilitated the trip. Uganda has been facing challenges in mass rearing of biocontrol agents for Parthenium. Despite several workshops that were held in Ethiopia in the past years in regard to biocontrol of Parthenium, the Ugandan Principal Investigator (PI) on the project never attended any of the workshops due to past visa restrictions in Ethiopia. Similarly, following delays in signing the agreement between Kenya Agricultural and Livestock Research Organization (KALRO) and IPM-IL, Kenya is far behind in implementation of the Regional Parthenium Biocontrol Project in Eastern Africa. The workshop therefore played a significant role to update Uganda and Kenya in the implementation status of the Parthenium biocontrol project. During the workshop, a presentation was made by Ethiopian counterparts which enabled Kenya and Uganda

participants to know the various measures to be adopted in successful implementation of the Parthenium project. In the Kenya presentation, highlights were made on current challenges of Parthenium in crop and grazing land, and the environment. Concerns of various stakeholders about the weed were pointed out, including the need to eradicate the weed. It was also indicated that there is no appropriate control measure currently to manage the weed in Kenya and efforts are being made to urgently introduce Parthenium biocontrol agents. Uganda's presentation highlighted economic importance of Parthenium in cereal crop production (including maize and sorghum) despite current efforts by Uganda government to increase production of these staple food crops. On the other hand, while wildlife is the second highest foreign exchange earner in Uganda from tourism, Parthenium has already invaded 2 out of 10 national game parks and tourism is being threatened as grazing land for wild animals are being reduced due to Parthenium invasions. The presentation further highlighted the challenges in current rearing of the Parthenium biocontrol agents which has resulted in low numbers being produced. Dr Wondi from Virginia State University made an elaborate presentation on techniques for mass rearing of biocontrol agents for Parthenium that ranged from cultivation of Parthenium plants (quality, quantity and growth stage requirements for the biocontrol agents) to culturing bioagents at a rearing facility.

Training Activities Conducted:

Training at Wollenchiti Rearing facility

Participants were introduced to the Parthenium stock plants both in the nursery and in plastic pots in the screen house and requirements as well as procedures for raising healthy high quality plants were reviewed. The participants learned techniques for introducing Parthenium plants in cages and specific number of insects required for each cage, acquired knowledge on duration of egg laying in each cage before adult insects can be removed and transferred to the next set of cages, learned techniques for removal of late larval instars from plants and introduction in soil in eclosion boxes to raise adult insects, learned techniques for collection of insects for field releases and techniques for soil sterilization by using solar heat.

Training at Ambo University Rearing facility

The training helped to refresh the minds of participants. Additionally during the tour of the rearing facility, it was noted that at least 500 potted Parthenium plants are required at any one time in the

rearing facility. It was also noted that Parthenium plants in cages need to be sprayed twice a day with water to encourage feeding by *Zygogramma bicolorata* while *Listronotus setosipennis* survives under relatively dry conditions. At least 10 cages are required for each species in a rearing facility to raise adequate number of adult insects for field releases. A sample device was shown that facilitates daily watering of Parthenium plants in cages.

Training at Awash Melkasa Agricultural Research Centre

A trip was made to Awash Melkasa Agricultural Research Centre in order to learn techniques for release of the Parthenium biocontrol agents. The participants made inspection of fields in order to identify suitable sites infested with Parthenium and two release sites were identified. The participants received practical training on releasing of adult *Z. bicolorata* and a total of 5,000 adult insects were released.

Suggestions, Recommendations, and/or Follow-up Items:

During the training, no field trip was arranged to any of the previous release sites in Ethiopia for the Parthenium biocontrol agents that was necessary to inform participants on establishment of the two species of biocontrol agents and their potential impact. A technique for monitoring establishment of the Parthenium biocontrol agents in the field was described but no attempt was made to demonstrate it practically in the field to the participants. It was mentioned that it could not be possible to travel to the release sites that were quite far away. Also based on the fact that the two species of bioagents can undergo diapause during the dry season, it was not necessary to visit the release sites as adult insects could have gone in the soil due to dry conditions that were now setting in Ethiopia.

Both Uganda and Kenya missed the opportunity to visit field release sites to appreciate the performance of the biocontrol agents that can be addressed in the next workshop in Ethiopia. A workshop could therefore be arranged probably during the planning and review workshop in Ethiopia in future during the rainy season when the biocontrol agents have emerged after diapause and they are active in the field.

List of Contacts Made

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