IPM Trip Report

Country(s) Visited: Ethiopia

Dates of Travel: April 13 to April 27, 2019

Travelers' Names and Affiliations: Dr. Wondi Mersie, Virginia State University (VSU)

Purpose of Trip: to assess the implementation of Parthenium Project objectives and plan activities for the coming rainy season.

Specific objectives of the trip were to:

(i) To assess the progress of rearing the leaf-feeding beetle *Zygogramma bicolorata* and the stem-boring weevil, *Listronotus setosipennis* at Wollenchiti, Ethiopia.

(ii) To meet staff from the rearing facilities at Guder and Wollenchiti to determine the major challenges faced in 2018 and discuss solutions for the coming season.

(iii) To visit sites around Arba Minch where the two biocontrol agents were released in 2018.

(iv) To plan rearing *Zygogramma* and *Listronotus* at Arba Minch Plant Clinic Center.

(v) To identify potential field sites for bioagent release during the coming season.

Sites Visited: Arba Minch Plant Clinic Center, Arba Minch Agricultural Research Center, Ethiopian Institute of Agricultural Research (EIAR), Harar and Wollenchiti bioagent rearing site

Description of Activities/Observations:

Itinerary:

April 13: Traveled to northern Virginia to spend the night for the morning flight.

April 14: Fly from U.S.A. to Addis Ababa, Ethiopia.

April 15: Arrived in Addis Ababa, Ethiopia.

April 16: Traveled to Harar to see parthenium infested fields and get first-hand information on potential sites for the release of the biocontrol agents. The rain has started in the Harar region and parthenium is beginning to emerge.

April 17: Returned from Harar.

April 18: Traveled to Wollenchiti to visit the biocontrol rearing facility. Held a meeting with staff to discuss the challenges and progress made at the rearing site. The primary challenge in 2019 has been lack of rain so far. Because of the lack of rain there were no parthenium seedlings around Wollenchiti for transplanting. Staff have to travel long distance to collect parthenium. Such frequent travel by staff outside of Wollenchiti takes them away from the maintenance of the biocontrol agents. Additional "BUGDOME" brought from U.S. were provided to the rearing center. These rearing cages are made of lightweight plastic and they will replace those that are made of metal covered with mesh. These BUGDOMEs are light and are sealed preventing the escape of biocontrol agents.

April 19: Visited the EIAR HQ to brief the EIAR Director General on the progress of the Parthenium Project and ask him to respond to emails sent to him about the funds advanced to his agency by IPM IL to implement its share of the Parthenium Project. However, he was called to attend another meeting and I was not able to meet with him. I left a message with his administrative assistant about the purpose of my visit.

April 20: Attended a forum on agricultural transformation in Ethiopia. The meeting was called by the State Minster and was chaired by the Ethiopian Minster of Agriculture. The forum was attended by one hundred and thirty people all engaged in some aspect of agriculture. The presentations and the discussions focused on the current challenges and opportunities faced in increasing the yield of the four major crops, teff, wheat, corn and sorghum in Ethiopia. There is a plan to eliminate the importation of wheat by 2023 by increasing its production in Ethiopia. The participants provided to the Minster suggestions and recommendations on how to address the bottlenecks in the agricultural sector.

April 21: Spent the day answering emails and preparing the trip to Arba Minch on Monday.

April 22: Flew to Arba Minch along Lidya Alemayehu. The town of Arba Minch is located 313 miles southwest of Ethiopia's capital Addis Ababa in the Southern Nations and Nationalities and Peoples Region (SNNPR) of Ethiopia. The area around Arba Minch

gets 830 mm of annual rainfall and is highly infested with parthenium. The fields are fertile and are usually separated by wooded area.

There is a Plant Clinic Center at Arba Minch operated by the Ethiopian Ministry of Agriculture. The Parthenium Project is collaborating with the Clinic in biological control of the weed. Both Zygogramma and Listronotus have been released in the area. The Director of the Clinic, Mulualem Mersha, Lidya Alemayehu and Wondi Mersie visited the sites where *Zygogramma* and *Listronotus* were released in 2017 and 2018 in the afternoon of April 22. We found eggs and larvae of Zygogramma on recently emerged parthenium seedlings from the releases done in 2017 and 2018. Mersha, Alemayehu and Mersie also visited Germaw Dolisso, Director of the Araba Minch Agricultural Research Center, a part of the Southern Agricultural Research Institute. The center provided land in 2018 for release of the biocontrol agents and the Director indicated that he will continue to collaborate with the Parthenium Project in the coming season.

April 23: In the morning Mersha, Alemayehu and Mersie visited additional release sites. At all the release sites, eggs and larvae of *Zygogramma* were found on parthenium. At the campus of the Araba Minch Agricultural Research Center, Lidya also found *Listronotus* larva in the stems of parthenium plants. *Listronotus* was released in the campus in 2018. At many of the release sites, *Zygogramma* has moved from the original spots to new locations. The rains recently started and parthenium is beginning to emerge around Arba Minch. It appears both *Zygogramma* and *Listronotus* were able to diapause in the soil during the dry season and were able to emerge as soon as it started to rain.

In the afternoon, Mersha, Alemayehu and Mersie returned to the compound of the Clinic to meet other staff members. The Clinic is in the process of repairing a small greenhouse for rearing first *Zygogramma* and later *Listronotus*. Lidya gave a quick training session to staff on handling and multiplying the biocontrol agents. Mersie gave materials brought from U.S. to the Clinic to help start rearing the biocontrol agents. Further discussion was held with Mulualem and staff on how to get the facility ready for rearing this season.

April 24: Alemayehu and Mersie flew back to Addis Ababa.

April 25: Alemayehu and Mersie traveled to Wollenchiti to visit the biocontrol rearing facility. Alemayehu inspected the parthenium stock as well as cultures of *Zygogramma* and *Listronotus*. She made recommendations to the staff on how to improve the quality of the parthenium stock and increase the number of *Zygogramma* and *Listronotus* adults

produced at the facility. Mersie held a meeting with all the staff and discussed each person's duties at the facility in the coming season.

April 26: Mersie flew back from Addis Ababa to Washington DC.

Training Activities Conducted:

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

Suggestions and recommendations were provided on how to produce quality parthenium stock for rearing the bioagents on a regular basis. Staff have been instructed to seed and transplant parthenium every week. They are also asked to fertilize and water the potted parthenium seedling on regular bases to produce quality stock for rearing. Recommendations were also made on how to increase the number of adult *Zygogramma* and *Listronotus* reared at each site.

List of Contacts Made:

Name	**Title/Organization**	**Contact Info (address, phone, email)**
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