

IPM Innovation Lab Trip Report

Country(s) Visited: Ethiopia

Dates of Travel: June 20 to July 9, 2018

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

Purpose of Trip: to assess the progress made in rearing, release and monitoring of the two approved biocontrol agents, the leaf-feeding beetle (*Zygogramma bicolorata*) and the stem-boring weevil, (*Listronotus setosipennis*) in Ethiopia.

Specific objectives of the trip were to:

- (i) To visit the bioagent mass rearing sites at Guder and Wollenchiti and assess the status of each biological agent.
- (ii) To discuss with staff about the challenges and opportunities at each rearing site.
- (iii) To confer with partners about the progress of bioagent rearing, release and monitoring.
- (iv) To review the progress of the rearing activities at each site and make changes if needed on the procedures followed to raise parthenium stock and rear *Zygogramma* as well as *Listronotus*.
- (v) Visit sites where *Zygogramma* and *Listronotus* were released and see the conditions of the bioagents.
- (vi) To identify potential field sites for bioagent release during the coming season.
- (vii) Release *Zygogramma* and *Listronotus* at parthenium infested fields.

Sites Visited: Melkassa Agricultural Research Center (Ethiopian Institute of Agricultural Research), Wollenchiti bioagent rearing site, Ambo University (Guder Campus), Koka parthenium infested field and parthenium infested fields at Harar.

Description of Activities/Observations:

Itinerary:

June 20: Traveled to northern Virginia to spend the night for the morning flight.

June 21: Fly from U.S. to Addis Ababa, Ethiopia

June 22: Arrived in Addis Ababa, Ethiopia.

June 23, 24 and 25: 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. The biocontrol agents could be released after the last week of July. Returned to Addis Ababa on June 25.

June 26: Met Ms. Sintu (Lidya) Alemayhu, VSU's Parthenium Project Coordinator in Ethiopia. Travelled to Wollenchiti to meet the workers at the rearing facility and examine the statuses of the *Zygogramma* and *Listronotus* cultures. Suggestion were made on how to grow quality parthenium stock to rear the bioagents and improve the handling of the agents. Delivered supplies brought from U.S. for rearing the bioagents. On the way back from Wollenchiti to Addis Ababa Lidya Alemayehu and Wondi Mersie stopped at Mojo where *Listronotus* and *Zygogramma* were released in July 2017. The field was inspected for the presence of *Listronotus* and *Zygogramma* on parthenium plants. Oviposition marks made by female *Listronotus* were observed on the flowers of parthenium. Data was then collected on the establishment and spread of *Listronotus* by counting the number of oviposition marks on each parthenium flower in a 0.25 m² area. The spread of the biocontrol agent was assessed by measuring the distance between the release spot and the location where parthenium plants with *Listronotus* were found.

June 27: Traveled to Melkassa Agricultural Research Center to inspect sites where *Zygogramma* was released in May 2018 and scan the area for new parthenium-infested fields. *Zygogramma* has adults were found on the sites where it was released in May. At the sites where parthenium was still standing the larvae of *Zygogramma* can be seen on the newly emerged shoots. Fields with parthenium were identified for future release.

June 28: Mersie went to the USAID Mission office in Addis Ababa to visit with Dr. Faith Bartz Tarr, AAAS Science and Technology Policy Fellow & Agriculture Officer at Office of Economic Growth and Transformation. Mersie briefed Dr. Tarr on the progress of the Parthenium Project in Ethiopia. Discussion was held on the impact of parthenium on Ethiopia's agriculture and the effort of the project in managing the weed using biocontrol agents. Its ability to change the taste of milk when cows graze on it is adversely affecting infant nutrition in Ethiopia. Dr. Tarr also noted its possible effect on the honey supply after bee forage on parthenium flowers. Dr. Tarr reiterated her support for the Parthenium Project and wants to be informed on its progress.

June 29: Traveled to Koka (60 miles southeast of Addis Ababa on the road to the city of Hawassa) to visit sites where *Zygogramma* was released. Examined parthenium plants for eggs, larva and adults of *Zygogramma*. Also collected parthenium seedlings for transplant

at Wollenchiti rearing site along workers hired from the nearby town. Large numbers of high quality parthenium seedlings were transported to Wollenchiti to be used for rearing biocontrol agents.

June 30, July 1 and July 2: Stayed in Addis Ababa and worked on a manuscript under review, responded to emails and conferred with partners including Dr. Kassahun Zewide of EIAR about identifying secure release sites. Made several phone calls to partners in different regions of Ethiopia regarding biocontrol releases and monitoring their establishment.

July 3: Travelled to Guder to visit the rearing facility and confer with staff who works there. The rearing facility is located on a satellite campus of Ambo University (AU) at Guder. Met AU faculty who are collaborating on the parthenium project and held discussion with Gonfa Kwessa, Dean of the College of Agriculture and Veterinary Science. Met with staff at the rearing site and discussed the challenges they face. Delivered supplies brought from U.S. for the rearing site. Met with Tesfay Amare, and Fulae Gelana a faculty member and at technical staff at Ambo University. Visited a field experimental site established to demonstrate the safety of *Zygogramma* on the oil seed crop, noog. Five noog varieties in three replications were planted at two sites one that will receive *Zygogramma* adults while the other site will serve as a control growing without the bioagent. Noog has emerged along parthenium and *Zygogramma* will be released on the experimental site in August.

July 4: Went back to Wollenchiti rearing site to have further discussion with staff who are rearing the two biocontrol agents. The dialogue with staff included about the impact of parthenium on their health, wearing protective clothes and other supplies needed to accomplish the tasks at the facility. In the afternoon Mersie traveled back to Koka to visit the site where *Zygogramma* was released and to have a close look status of the bioagent. *Zygogramma* is laying eggs in large numbers and a lot of larvae was seen on parthenium buds.

July 5: Traveled back to Melkassa Agricultural Research Center to confer with administrators there about securing additional sites to multiply the biocontrol agents. Two new fields with heavy parthenium infestations were identified that can be fenced and used as a safe places for the agents to reproduce.

July 6. Met with Lidya and discussed the tasks that need to be accomplished in the coming months.

July 7: Spent the day making phone calls to partners about the on-going work and plan for the coming months.

July 8: Traveled back from Addis Ababa to U.S.

July 9: Arrived at Dulles Washington D.C. Airport and drove home.

Training Activities Conducted: no formal training session was organized on this trip.

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 Zygomma and Listronotus reared at each site.

List of Contacts Made:

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