Maintaining Colonies of the Tarnished Plant Bug

Raksha Chatakondi
USDA-ARS, Southern Insect Management Research Unit

Lygus lineolaris, also known as the tarnished plant bug, is one of the most abundant pests throughout the south. Plant bugs attack a variety of plants, crops, and fruit trees. In areas where they are found, they have been known to cause a lot of damage. Plant bugs are collected from their natural habitats by sweep nets and brought back to the lab to be studied.

Adult tarnished plant bugs are able to lay eggs in about four to eight days after becoming adults in the incubator. In order to keep all the eggs in one place, scientists place egg packs on the net covering the plant bugs. To make an egg pack, use a beaker filled with 20 grams of carrageenan and 500 mL of water and mix it until the carrageenan is fully dissolved in the water. A sheet of foil is placed on top of the beaker and the beaker is put into the autoclave for a little over an hour. The autoclave reaches temperatures above 100 degrees Celsius in order to completely sterilize the mixture. After the beaker is removed from the autoclave, the mixture needs to reach around 50-55 degrees Celsius before it is emptied into a squeeze bottle. Then four inch by four inch parafilm pouches are filled halfway with the mixture and sealed at the top to prevent spillage. The finished gel packs are stored in a Ziploc bag with the day's date on it and kept in the fridge.

Plant bugs in an incubator

Plant bugs can feed through the membrane of diet packs placed on the cloth covering the box they are in. Plant bug diet is composed of Component A (toasted wheat germ, lima bean meal, soy flour, egg yolk, and distilled water) and Component B (torula yeast, soy lecithin with oil, vanderzant vitamin mix, streptomycin, sugar, honey, benzoic acid, and distilled water). All of the ingredients in Component A are mixed together in a 1000 mL beaker, placed in the autoclave for sterilization, and removed after it has cooled to at least 50 degrees Celsius. The ingredients for Component B are mixed and placed in a blender with a cooled Component A. The two mixtures are blended together on low and high for two minutes. The final mixture is then poured into four inch by four inch parafilm pouches that are sealed shut to avoid outflow. The finished diet packs are stored in a Ziploc bag with the day's date on it and kept it in the fridge.

Artificial habitats are made for tarnished plant bugs to allow scientists to observe the species' reactions to certain variables. In order to create artificial habitats for plant bugs, the bugs are collected from wild host plants all over Mississippi. The bugs are then transferred to plastic boxes filled with shredded paper. To make an artificial habitat for plant bug nymphs, fill the box with shredded paper, place a stretched diet pack and gel pack on top of the paper, and put a very fine cloth on top of the box and close the lid. To make an artificial habitat for adult plant bugs, fill a plastic box with shredded paper, place a cloth with 1-2 mm openings on top of the box, close the lid, and place a stretched diet pack and gel pack on top of the net. Adult plant bugs are able to lay eggs and feed through both the net and stretched parafilm whereas nymphs can only lay eggs and feed through the stretched parafilm. Diet packs and egg packs have to be changed twice a week. In nymph habitats, remove the old diet pack and place a new stretched pack in its place. For adults, the egg pack must be placed in a new box filled with shredded paper and the diet pack must be replaced with a new stretched diet pack. Maintaining these artificial habitats allows scientists to continue their research on one of the South's most important pests.

Reference:
Allen, K. Clint, R.E. Jackson, G.L. Snodgrass, F.R. Musser. 2012. Comparative susceptibilities of different life staged of the tarnished plant bug (Hemiptera: Miridae) to three classes of insecticide. Southwestern Entomologist. 37(3): 271-280