Flowering plants for arthropod pest management in crop production

One of the important approaches under integrated pest management (IPM) is conservation biological control, which involves modifying or protecting a habitat or ecosystem by promoting flowering plant diversity and increasing natural enemy populations. The excessive use of chemical pesticides in vegetable production has created environmental, human health, and economic risks. Insectary plants serve an important role in conservation biological control as they promote eco-friendly pest control that aligns with IPM principles and enhances agricultural ecosystems. Insectary plants produce nectar and pollen and draw natural enemies towards them; thus, they can become an alternative to chemical pesticides for arthropod pest control in crop production. Multiple studies have been conducted on the use of insectary plants in other regions of the United States. However, their suitability as a pest management technique is still to be explored in the southeastern states, including Tennessee. Our objective was to evaluate the suitability of various flowering plants for attracting arthropod natural enemies using six different plant species, where buckwheat, sunflower, zinnia, marigold, and sweet alyssum are flowering plants and green beans (as a crop plant) were the control. Plant species were selected based on their USDA hardiness zones, which match Tennessee's hardiness zones. We conducted a field study in Nashville, Tennessee, from April to September 2023. We used a randomized complete block design with four blocks, using a field gradient as the blocking factor. We randomly assigned the treatments to each block and conducted weekly sampling once the plants were four weeks old after transplanting. Plants were evaluated for natural enemies like lady beetles, flower flies, big-eyed bugs, *Orius spp*., tiger beetles, goldenrod soldier beetles, etc., using plant tissue collection, beat sheet sampling, sweep net sampling, pitfall traps, and visual observation. Specimens of arthropods were collected and identified. The research provided significant information on the efficiency of these insectary plants in attracting and sustaining populations of natural enemies like insect predators. Incorporating these insectary plants within diverse crops, considering specific preferences of natural enemies for various stages of flowering plants, offers a sustainable technique for arthropod pest management. We will discuss some of the results.