Insectary Plants: Flower Power for Natural Enemies of Vegetable Pests

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What are insectary plants?

Many natural insect enemies of vegetable pests, like predators and parasitoids, feed on flower nectar and pollen to meet or complement their nutritional requirements. Studies have shown that these floral resources aid in enhancing the survival and fecundity of these natural enemies. Thus, it is useful for growers to consider how the habitat for our insect allies can be enhanced through the addition of insectary plants – those documented to provide floral resources to beneficial insects.

Types and layouts of insectary plants

Some plant families, like the carrot and aster families, are outstanding sources of insectary plants primarily due to their flower shape. Insect natural enemies like parasitoid wasps have tiny mouthparts and they find floral resources in these families to be very accessible. Besides considering flower shape, another important aspect is the type of natural enemy that the plants are likely to attract and how likely an insectary plant is to be a host for an insect pest or plant pathogen. Thus, the use of insectary plants needs to be carefully designed based on the flowering plant information, natural enemy presence and local pest occurrence. For instance, elderberry flowers can attract many beneficial insects but this plant can also be a host to the spotted wing drosophila – a fruit fly pest. Thus, elderberry should be omitted as an insectary plant in farms where this fly is a problem to prevent an unintended pest reservoir.

Syrphid or Hover fly feeding on nectar from dill
Photo: A. Legrand, UConn

There are several choices on how one may incorporate insectary plants as part of the farm operation, including intercropping or planting as managed field borders or hedgerows. For example, the benefits of adding sweet alyssum as an intercrop within lettuce fields in California have been well established. Sweet alyssum attracts hover flies (aka flower or syrphid flies, pictured above) whose larvae are effective aphid predators.

Insectary plants can also serve multiple functions as in the case of buckwheat and clovers, which are cover crops. Native wildflowers are often suggested for natural enemy attraction. Culinary herbs, including dill and cilantro, can also be used. Specialty cut flowers can also be used, with the idea that growers can enhance the habitat for insect natural enemies of vegetable pests and at the same time gain income from the sale of fresh or dried flowers.

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Pink-spotted ladybird beetle feeding on nectar from Celosia.
Photo: A. Legrand, UConn

A study done at the University of Connecticut evaluated several cut flowers for their attraction of beneficial insects. For each plant type, observations were done on the type of beneficial insect that visited the flowers for nectar/pollen and shelter. Results documented a high diversity of natural enemies visiting the flowers (Fig. 1). Altogether, insects from 14 parasitoid families were collected, along with insects from 9 families that include mostly insect predators. *Ammi majus* stood out as the plant with the largest number of natural enemy families collected. Other flowers that attracted a good diversity of insect families include globe amaranth (*Gomphrena globose*) 'Vegas White' and cockscomb celosias (*Celosia argentea cristata*) 'Kurume' and 'Triangle Mix'. All of the flowers tested attracted a high number of anthocorids, which are important general insect predators. Most flowers attracted ladybird beetles and in particular the plumed (*Celosia argentea plumosa*) and cockscomb celosia were used by the pink-spotted ladybird beetle for nectar and for shelter (see photos). It was expected that cockscomb celosia would attract hover flies, however this was not the case. This plant is described by others as one that attracts these flies but the flower structure may not be accessible or a good fit to them. In regards to insect parasitoids, only *Ammi majus* attracted both braconids and ichneumonid wasps – two large families of parasitoids, many of which attack vegetable pests.

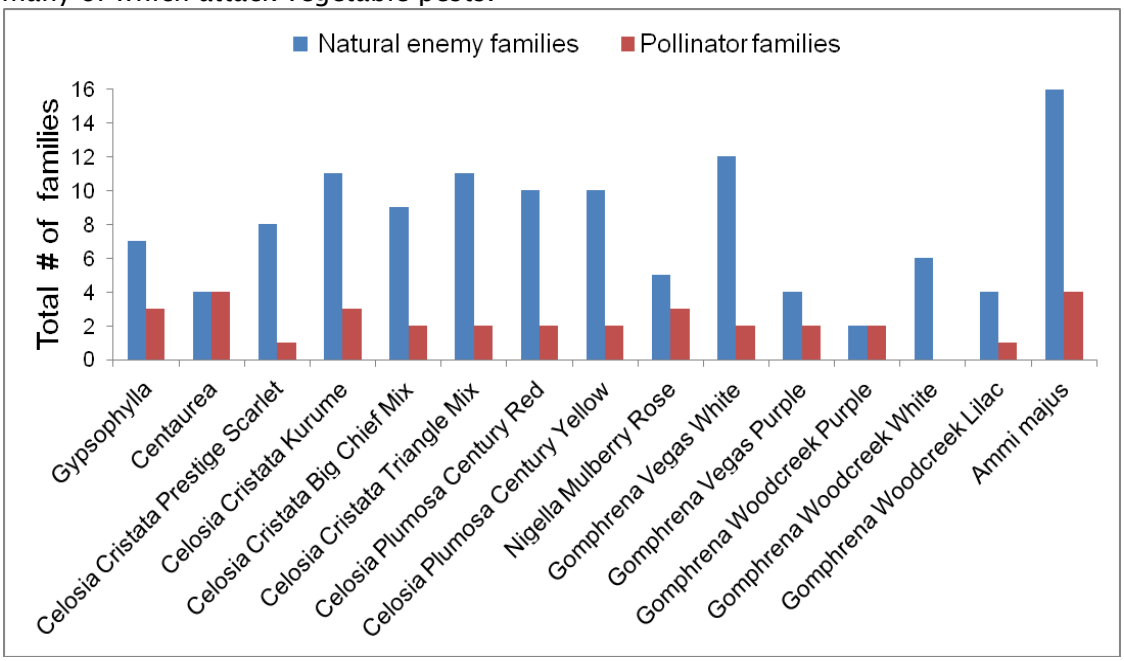

Figure 1. Total number of insect families represented by insects collected directly from flowers. Natural enemy families include insect parasitoid and predatory species. Pollinator families include all other insects classified.

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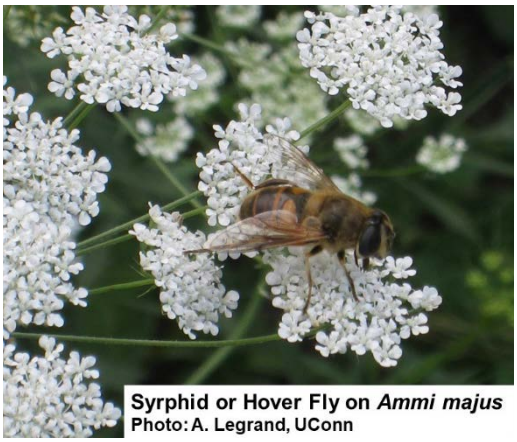
Around the country, research is ongoing on the best ways to deploy insectary plants within or outside the agricultural field and there is a lot of exciting work being carried out to further develop this IPM approach. Lists of insectary plants are available to assist growers in selecting a diversity of plantings that can fulfill multiple needs and provide blooms for the entire season. For a detailed list of insectary plants documented to attract natural enemies visit the UConn IPM website at this link:
http://ipm.uconn.edu/documents/raw2/html/555.php?aid=555



Syrphid or Hover Fly on *Ammi majus*
Photo: A. Legrand, UConn

Additional Resources

Use of cover crops and green manures to attract beneficial insects. By Jeremy Plotkin, NEVBC Proceedings 1999. http://ipm.uconn.edu/pa_vegetable/

Farmscaping to enhance biological control. By Rex Dufour, NCAT 2000. http://extension.oregonstate.edu/sorec/sites/default/files/farmscaping.pdf

Farmscaping: making use of nature's pest management services. By Geoff Zehnder, 2013. http://articles.extension.org/pages/18573/farmscaping:-making-use-of-natures-pest-management-services

Farming with native beneficial insects. Xerces Society Guide. 2014. Storey Publishing, MA.

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