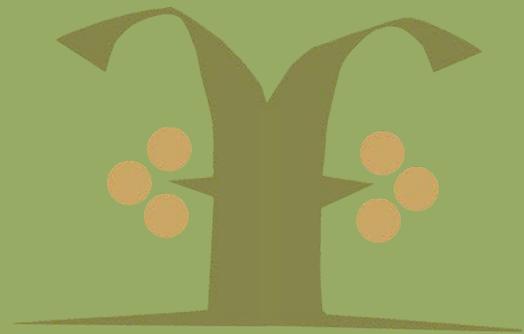


Martha's Vineyard Pollinator Pathways:  
*Promoting Pollinators on Island Farms*

Project Update - August 2022  
Reported by Matt Pelikan, BJFFF



The Betsy and Jesse Fink  
FAMILY FOUNDATION



Brown-belted bumblebee  
*Bombus griseocollis*



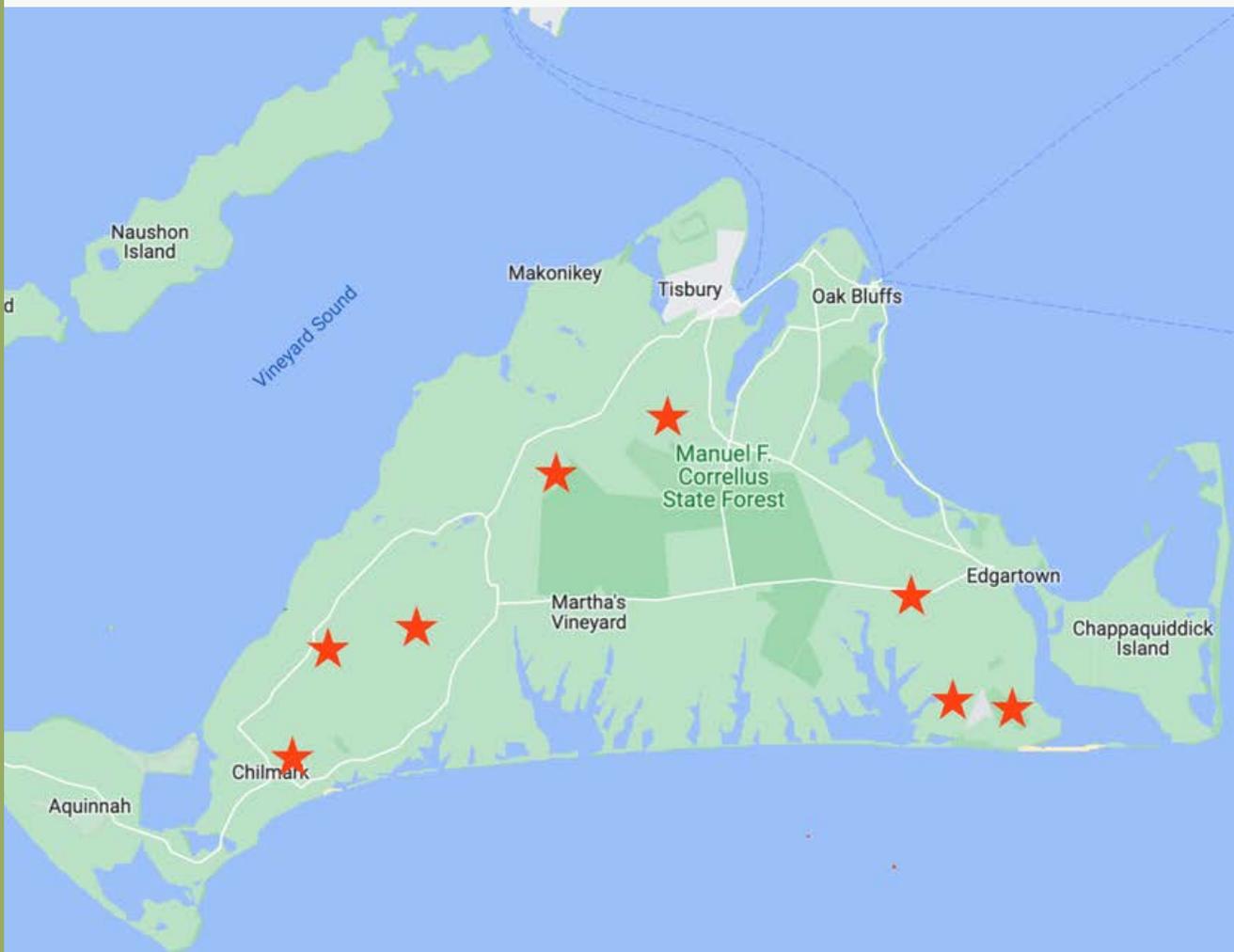
Broad-handed leafcutter  
*Megachile latimanus*

## Included in this report:

- [Summary of Activity](#)
- [Bee Summary](#)
- [Overall Pollinator Summary](#)
- [Tentative Conclusions About Plant Popularity](#)
- [Next Steps](#)
- [Additional Resources](#)

# Thank you!

Thanks to the eight farms that volunteered to participate in this pilot project to enhance pollinator diversity on Martha's Vineyard agricultural land! This three-year project involves installing plots of flowers selected to be attractive to specialized pollinators; monitoring those plots and surrounding farmland in order to determine what effects (if any) these added floral resources produced; and formulating recommendations for future management that will give farmers feasible methods to increase pollinator diversity on their farms. The project is a cooperative effort of the Betsy and Jesse Fink Family Foundation (BJFFF), the Martha's Vineyard Atlas of Life project at BiodiversityWorks, and the eight participating farms. Also, a special thanks to Elisabeth Sheldon of Land-ho! Farm and Parker Fyfe-Kieran (BJFFF's summer field assistant) for all of their work in the fields.



Farms participating in the pilot: Beetlebung Farm, North Tabor Farm, Mermaid Farm, Whippoorwill Farm, IGI's Farm Hub, Morning Glory Farm, Slough Farm, The Farm Institute

# Summary of Activity

Project planning this past spring included sourcing plant material and meeting with each of the participating farms to designate the project site and plan for irrigation and other kinds of plot maintenance. We created “projects” in iNaturalist to collect data and developed field data sheets to assist with the recording of information and observations on site visits. We gave trainings at two farms to seasonal staff on using iNaturalist, and two BJFFF staff members also received training on data collection and bee identification.

The project was assisted in mid-May by Molly Jacobson, a pollinator ecologist at the State University of New York/Syracuse, and a BJFFF fellow. Molly visited the Vineyard for five days to assist with project planning, early-season fieldwork, and bee identification. Chilly, overcast, and windy weather limited the effectiveness of the fieldwork performed, but Molly was able to visit and assess most of the participating farms and identify a number of difficult bee specimens. During a visit last November, Molly had been instrumental in refining our plant selections for the project plots. We expect that Molly’s contributions will continue for the duration of the project, particularly in the area of photography and specimen identification.

Project plants were installed in June. Our main source for plant material was Pinelands Nursery in New Jersey which specializes in propagating plant species native to the coastal Northeast. Our mix of species included several varieties of sunflower, two species of clover, two species of Monarda, asters, goldenrods, and butterfly weed. While we hope to see these selections attract a wide range of pollinators, the project puts particular emphasis on supporting certain pollen specialist bees that are infrequently reported on Martha’s Vineyard.

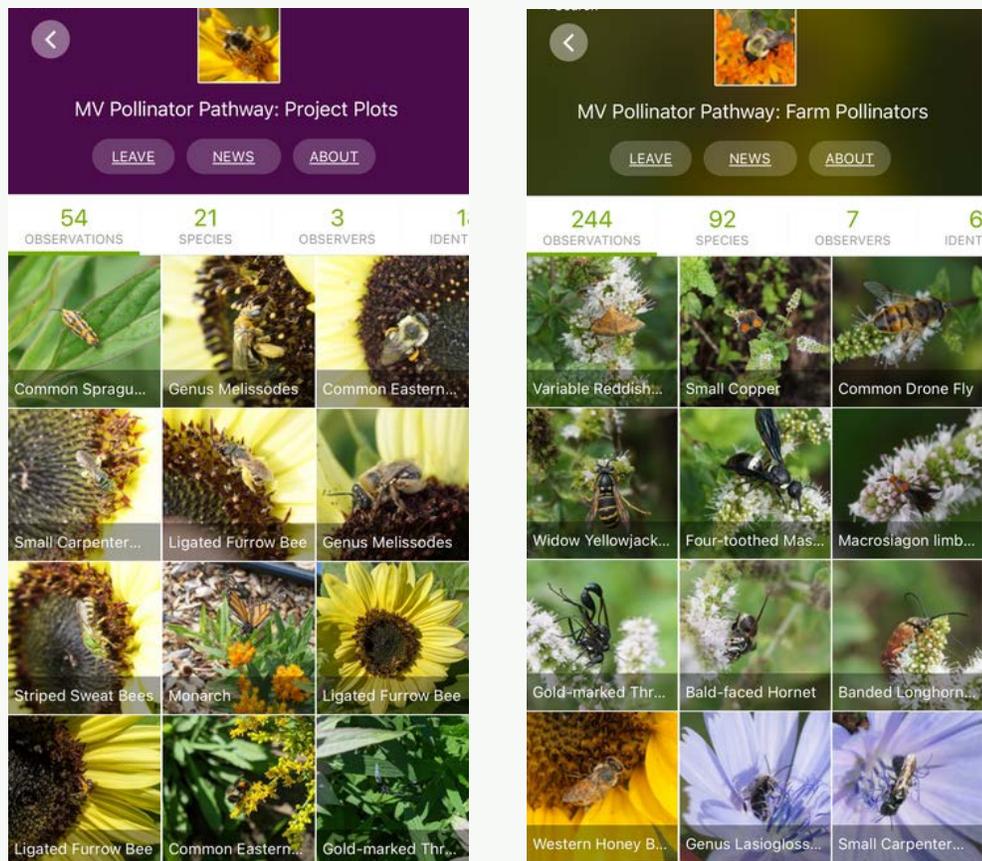
With the cooperation of the farms, BJFFF staff installed the plants and, in most cases, mulched the project plots to help suppress weeds, and arranged irrigation to support the plants as they got established. Despite minor problems with the availability of some of our target species, the sourcing and planting process went smoothly. In general, the plants have done well with the exception of butterfly weed (*Asclepias tuberosa*) which was purchased locally and experienced very high mortality. The cause of the mortality remains a mystery. By mid-August, the surviving plants and some replacements, though still rather stunted, had begun to bloom. So we anticipate these survivors will overwinter successfully, and we can augment their numbers with another planting in spring of 2023.

Also blooming by mid-August were sunflowers and both of our Monarda species.

# Bee Summary

A main focus for this project is bees, both because of their importance as pollinators and because of their vulnerability from a conservation perspective. So far we have monitored bees closely on sections of farms around the project plots, as well as within the plots once some of our flowers began blooming. We've relied extensively on photography, with identifications developed or confirmed in iNaturalist, to document bees. Our field notes contain records of bee species that can be readily identified by sight under field conditions. But recognizing that many, perhaps most bees can't be confidently identified to the species level from photographs, we've also collected bees for identification under a microscope, using scientific keys. Even some of these identifications are tentative; bee identification is not always a clear-cut process. But one reason for collecting specimens is that physical evidence will remain available indefinitely for refining or confirming identifications.

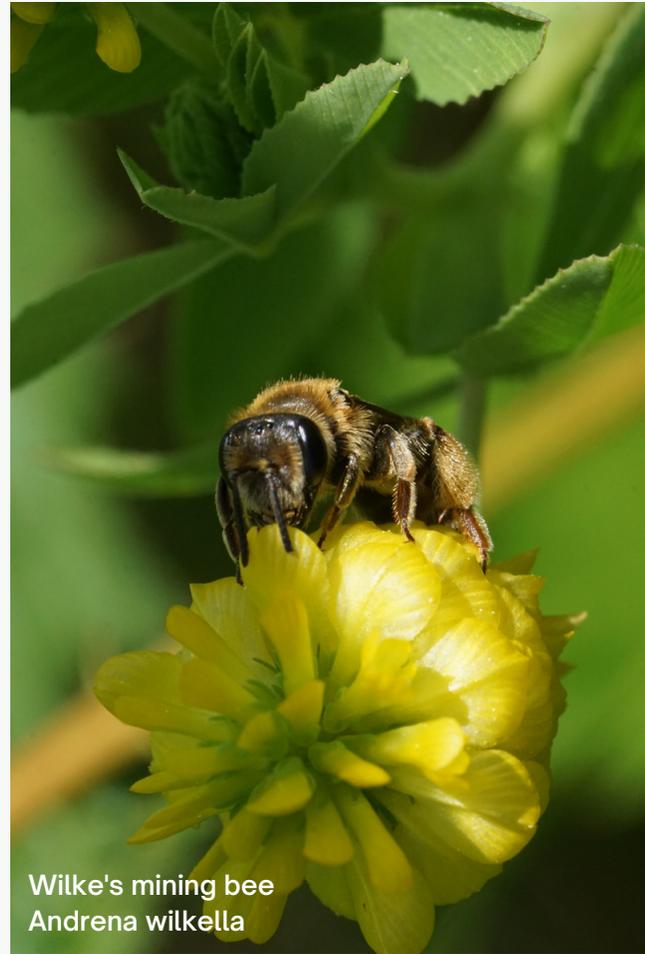
To date, 29 species of bees have been documented visiting flowers on participating farms. Because flowers in the project plots have only just begun blooming, the vast majority of bees have been found on flowers outside the plots. The balance of this season, and the two subsequent field seasons planned for this project, should show more bee activity within project plots, which will allow us to identify effects (if any) of the plants we installed.



Dedicated projects were set up in iNaturalist to capture species observations made on project plots and sections of farms around the project plots.

## Bee Summary Continued

Three of those bee species – western honeybee (*Apis mellifera*), *Andrena wilkella*, and *Anthidium manicatum* – are introduced species; the remaining 26 are native to our region. In terms of both numbers and diversity, bees observed so far are preponderantly common generalist species. Two bees, the western honeybee and the common eastern bumblebee (*Bombus impatiens*), have been found on all eight participating farms, sometimes in considerable numbers. The widespread presence of these bees is not a surprise, and given their numbers and versatility as pollinators, it is reasonable to assume that a good percentage of the total pollination being performed by bees can be attributed to these two species. The sweat bee (Halictidae) *Halictus ligatus* has likewise turned up on every farm; this small bee may well be the most common solitary bee on Martha's Vineyard, turning up pretty much everywhere there are flowers and therefore also playing a large role as a generalist pollinator.



Wilke's mining bee  
*Andrena wilkella*



Ligated furrow bee  
*Halictus ligatus*

## Bee Summary Continued

But less common or more specialized bees have also turned up in our surveys. The half-yellow bumblebee (*Bombus vagans*) has been found so far at two farms. This species is one of our less commonly reported bumblebees, and while it would be a mistake to put too much weight on a small number of observations, it's certainly possible that farms offer particularly congenial habitat for this bee. Perplexing bumblebee (*B. perplexus*), another uncommon *Bombus* on Martha's Vineyard, was documented at one farm. Longhorn bees (*Melissodes* sp.) have been recorded at seven of the farms so far, invariably in association with sunflowers (both within and outside our project plots). Some observations and even specimens of *Melissodes* remain identified only to the genus level; all members of the genus that we have positively identified so far have been *M. trinodis*. The association of this genus with composite flowers, and of *M. trinodis* with sunflowers specifically, is well established. But it was still gratifying to find a bee this specialized on so many farms, sometimes in considerable numbers.



Squash bee  
*Peponapis pruinosa*

The squash bee *Peponapis pruinosa*, which true to its name associates very closely with *Cucurbita*, has been found on five farms so far, and we expect it will eventually turn up on every farm that grows squash if we look hard enough. (Males, in particular, spend much of the day sleeping deep inside squash blossoms and can readily be found by looking into flowers. We've also observed bumblebees and sweat bees snoozing in squash flowers along with many striped cucumber beetles, *Acalymma vittatum*). Because of its association with squash, *Peponapis* is probably being supported on Martha's Vineyard mainly on farms, or (to put it another way) commercial production of squash is likely responsible for the persistence of this highly specialized bee on the Island. Less is known about the true status of many of our more obscure solitary bees, but the presence of less commonly reported bees such as *Hylaeus* sp., *Lasioglossum cressonii*, *Andrena miserabilis*, *Andrena nasonii*, and *Andrena nuda*, and *Megachile latimanus* on farms in this project suggests that agricultural land can indeed play a significant role in supporting bee diversity.

# Overall Pollinator Summary

An impressive diversity of other pollinators has also been documented on participating farms. As this report was being prepared, we've entered 244 iNaturalist observations of animals visiting flowers on general farm habitat, representing 92 species. Included in this list are 19 species of flies (Diptera), 12 species of butterflies, 14 species of non-bee Hymenoptera (i.e., wasps and sawflies), and even a bird (ruby-throated hummingbird, *Archilochus colubris*). Several of the wasps and sawflies we documented were first iNaturalist records for Martha's Vineyard. A dearth of iNaturalist records does not demonstrate that an organism is truly rare (it may simply be hard to detect, hard to document, or just not common in places where people typically look). But in adding these species to the [Martha's Vineyard Atlas of Life](#) project in iNaturalist, these records have contributed to our knowledge of Vineyard biodiversity.

Because they were newly established plantings that had no flowers at all until midsummer, numbers of pollinators documented in the project plots have been lower. It's also important to remember that, at roughly 250 square feet, project plots represent a much smaller area than do the sections of the farms that we've been surveying. To date, we've put 54 observations representing 21 species into iNaturalist from the project plots.



Spotted wood fly  
*Somula decora*

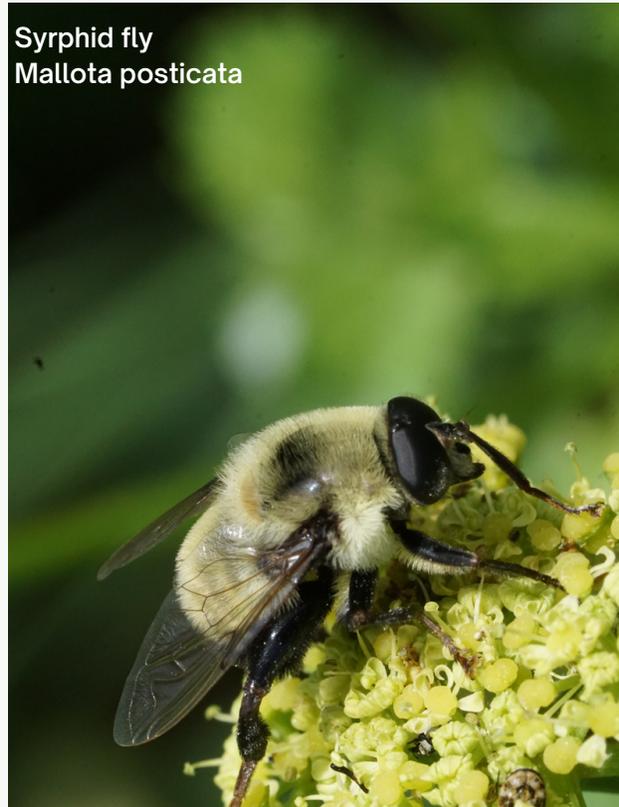


Common eastern bumblebee  
*Bombus impatiens*

# Overall Pollinator Summary Continued

If there is a main point to be made about our pollinator observations so far, it may be that flies (the order Diptera) are far more prevalent, and perhaps far more important in ecological terms, than most people would suppose. The most commonly recorded fly so far has been European drone fly (*Eristalis arbustorum*), a non-native Syrphid (or “hoverfly”) that appears to be virtually restricted to agricultural settings on Martha’s Vineyard. Another non-native Syrphid, the common compost fly (*Syrpita pipiens*), is found nearly everywhere on farms (indeed, nearly everywhere, period) and can achieve amazing levels of abundance. The native Syrphids in the genus *Toxomerus* were also widespread and numerous so far this year. Depending on their life histories, larval Syrphid flies may either be detritivores (that is, feeding on and helping break down decomposing organic matter) or predators of aphids; adults, because of their frequent visits to flowers, function as pollinators. So these flies, whether native or non-native, can be viewed as beneficial and perhaps very important components of farm biodiversity.

Syrphid fly  
*Mallota posticata*



In addition to common generalist flies, our monitoring has also documented some more unusual flies. *Mallota posticata* (another native Syrphid and a very convincing bumblebee mimic), found at one farm in late May, was a first Vineyard record in iNaturalist. An observation of a member of the genus *Lonchaea* remains the only Island iNaturalist record for this genus and is also just the second local iNaturalist record for the entire family it belongs to, Lonchaeidae. And an observation of *Ozodicermia* was one of just a handful of Island records for this obscure stiletto fly (Therevidae) genus.

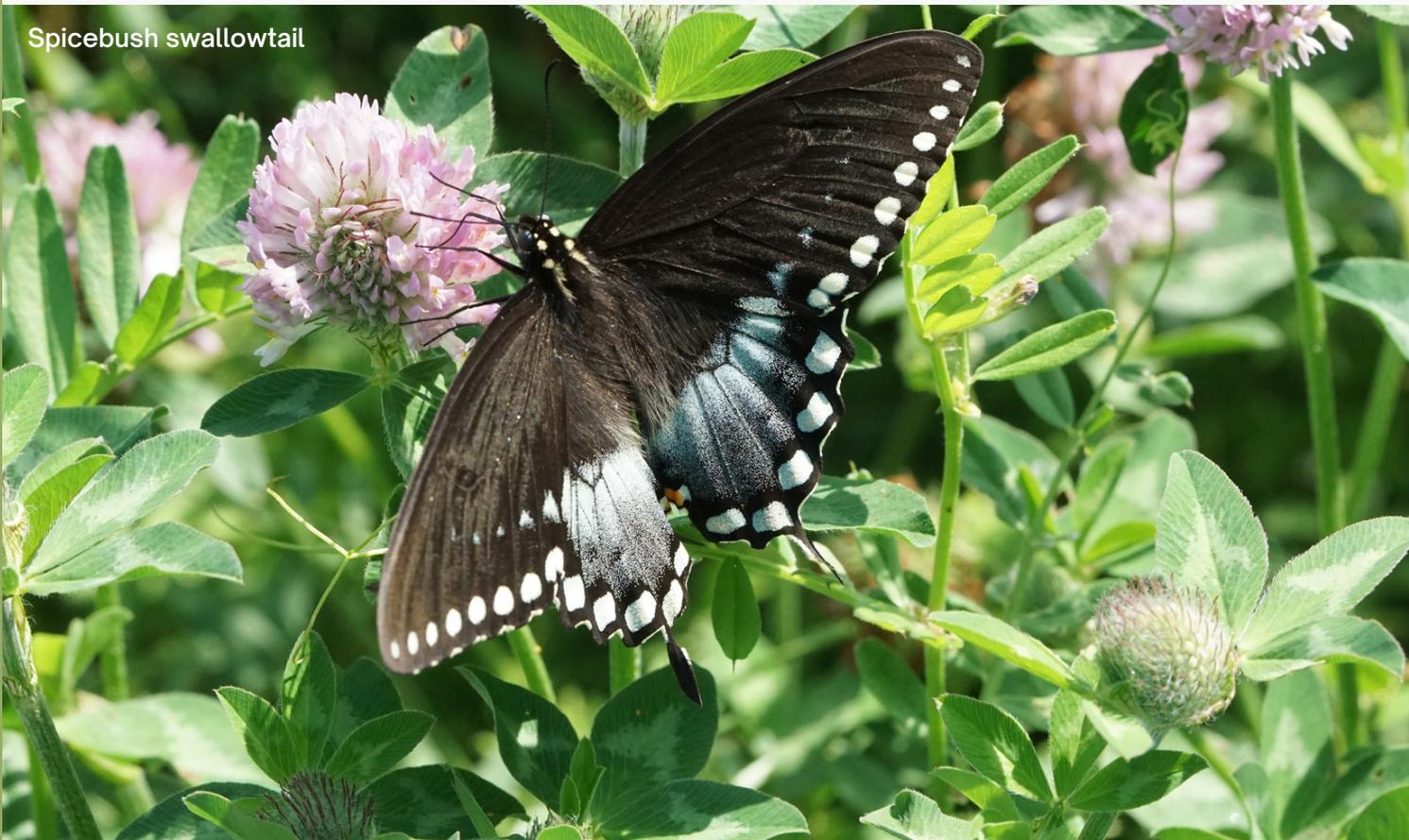
It is fair to say, then, that flies figure significantly in farm ecology, and that farms offer suitable conditions for a wide variety of flies, some of them uncommon or specialized. This makes sense. Not just Syrphid larvae but the larvae of many other kinds of flies are detritivores, and the wealth of decaying plant material on farms provides ample resources for these flies. Many flies visit flowers, whether to eat nectar or pollen or to find flower-loving insects to prey on or parasitize, and again, farms tend to be places where a lot of plants blossom over a very long season. Farms, therefore, offer particularly good habitat for flies.

# Tentative Conclusions About Plant Popularity

***Mixed cover crops appear to have considerable potential for supporting pollinators, if the cover crop species are chosen carefully and allowed to bloom.***

The best example was the early-season success of crimson clover (*Trifolium incarnatum*), either on its own or interplanted with what we took to be some variety of field pea (*Pisum sativum*) or a large vetch (*Vicia* sp.). On its own, crimson clover attracted a wide range of pollinators, including bumblebees, honeybees, and *Andrena* solitary bees. The combination of crimson clover with the pea or vetch produced an interesting division of resources, with bumblebees (in this case *Bombus griseocollis*) feeding almost exclusively on the peas while honeybees fed on the clover. Offering more than one kind of resource in this manner is probably a good idea, ecologically, since it allows pollinators to select their preferred food and reduces competition among species. Other clovers are also likely to be useful, whether grown as cover crops or simply allowed to flourish on their own on field margins. Our impression was that white clover (*Trifolium repens*) was generally more popular among pollinators than purple clover (*Trifolium pratense*); on several occasions we observed bees, especially honeybees, systematically passing over purple clover flowers in favor of white clover when both species were present and in full bloom.

Spicebush swallowtail



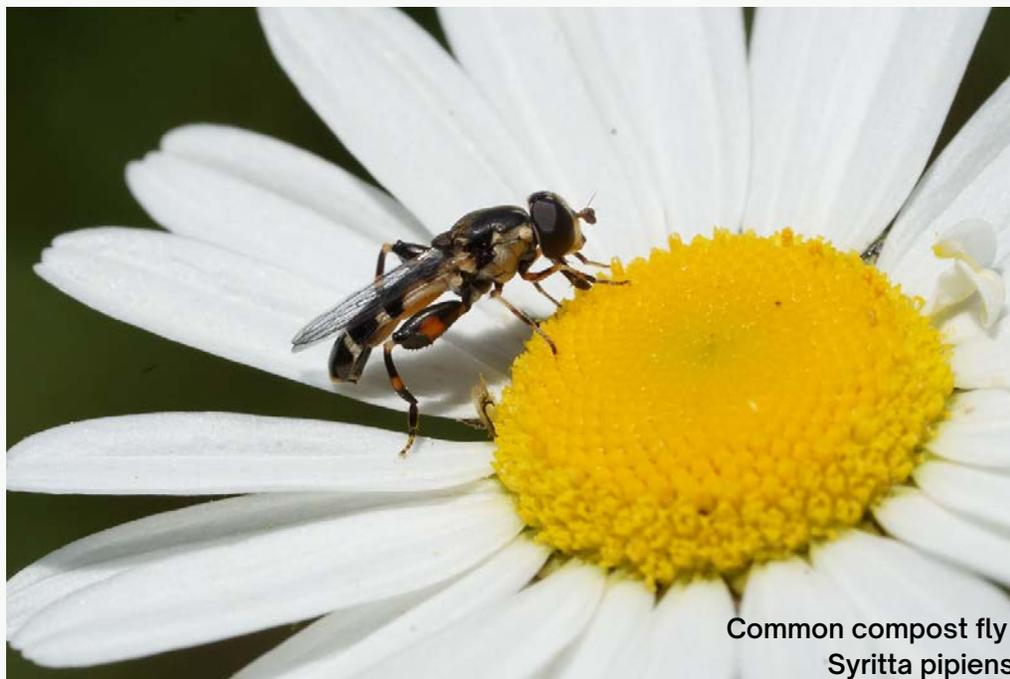
# Plant Popularity Continued

***Most farms offer very little in the way of floral sources for early-season native bees.***

Our native bee species become active as early as late March, and by mid-April, a substantial variety is on the wing. At this season, some participating farms had very little in bloom, and what was present was mostly non-native species (e.g., dandelions, *Taraxacum officinale*) that were evidently of little interest to native bees. Observations around the island generally suggest that willows (*Salix* spp.) from late March into mid-April and blueberry (*Vaccinium* spp.) from mid-April through the end of May are the main pollen plants for early-season native bees. Slightly later in the season (mid-May into early June), chokeberry (*Aronia* spp.) proved to be a wildly popular pollinator resource where it occurs. At a couple of farms, we've realized that blueberry patches exist that we weren't aware of this past spring; in 2023, we will make a point of investigating these.

It is noteworthy that, from the start of the season into mid-May, the roughly three-acre BiodiversityWorks property on Lambert's Cove Road produced records of more native solitary bee species than did all eight participating farms combined. Partly, this reflects landscape context and observer effort; but partly, it reflects the presence of a lot of blueberry on the BiodiversityWorks property, since it was on the blossoms of several blueberry species that most of those bees were found.

Adding woody plants like *Salix*, *Vaccinium*, and *Aronia* may not be easy for farms, since they will need to be permanent plantings. *Salix* may be challenging because it generally requires damp, wetland-edge conditions, and *Aronia* may be challenging simply because it appears to be difficult to source. But *Vaccinium* is easy to procure, relatively easy to grow, and depending on a farm's goals, could represent an additional early-season crop (some participating farms are already growing blueberry for the market). We think you can't go wrong adding any of these three plants to your farm, and in particular, we think that adding blueberry will substantially improve conditions for early-season native bees.



Common compost fly  
*Syritta pipiens*

# Plant Popularity Continued

## ***Sunflowers!***

As we started to move into late summer, sunflowers began blooming both in our project plots and, at most farms, in fields. As we expected, these flowers were pollinator magnets. As noted above, some long-horned bees (*Melissodes* spp.) are virtually obligate users of sunflowers and basically turned up wherever these flowers were available. But a wide range of other pollinators were also observed on sunflowers, and we are persuaded that *Helianthus*, planted widely and in large numbers, will reliably furnish a resource for both specialized pollinators and generalists.

We do note that from the pollinator's perspective, all sunflowers are not created equal. We observed a marked preference among pollinators for yellow-petaled varieties with medium to large disk size. Sunflowers with brown or mahogany petals, domed rather than flat disks, very small flowers, or doubled flowers were much less visited by pollinators. Probably the more desirable varieties are the ones that most closely resemble the original, wild species that native pollinators co-evolved with. While the two types are not always distinguishable to our eyes in the field, "pollen-free" varieties (bred to not drop pollen all over people's dining room tables) can be expected to have little appeal to pollinators. So we caution that the sunflowers best grown to support pollinators may not be the same varieties grown for the cut-flower market.



Western honey bee  
*Apis mellifera*

# Plant Popularity Continued

## *Other pollinator resources*

Many farms are already growing flowers specifically for pollinator support in “pollinator rows,” and our observations so far suggest that this is a valuable strategy. Moreover, all of the farms featured flowers in unmowed field edges and waste areas that also appeared to represent important floral resources for pollinators. The plants listed here span a wide range in terms of desirability: individual farms will need to make their own decisions on which of these (if any) to tolerate, encourage, or deliberately plant. But purely from a pollinator perspective, we believe that all of these will represent useful resources to pollinators.

- Radish family members including Brassica and radish (*Raphanus*). We were surprised at how much activity centered on this group of plants, which includes both agricultural weeds such as wild radish and cultivated food crops such as kale. Allowing Brassica crops to bolt and flower before removing them might be a workable strategy to enhance pollinator resources.
- Mints including *Glechoma* (ground ivy), *Nepeta* sp. (catmint), and *Leonurus cardiaca* (motherwort), appeared to be fairly important early-season resources. While some of these may be grown deliberately as herbs, they also flourish as “weeds” on field edges and waste areas. While we didn’t make any exhaustive study of how bees were using these plants, our impression was that they were being visited for nectar rather than pollen (meaning that they may support adult bees but are not useful for nest provisioning). If that’s true, then these plants alone would be insufficient to support the entire life cycle of a bee and would need to be augmented by other flower types. But particularly early in the season, when there are not a lot of other resources available, providing nectar to sustain adult bees as they search for suitable nest sites and begin establishing nests or colonies is an important role.
- *Phacelia tanacetifolia* (lacy phacelia, a borage family member) attracted large numbers of pollinators where we observed it in a “pollinator row.”
- *Glebionis coronaria* (crown daisy) is another “pollinator row” plant that appeared to be a valuable resource. We noted both social bees (honeybees and bumblebees) and solitary bees using it in significant numbers.
- Apiaceae or Umbelliferae (umbel-flowered herbs such as coriander or dill and “Alexanders” such as *Smyrniun* spp.) were visited by a wide range of pollinators, especially flies and wasps. While bees are ecologically very important, flies and wasps are also important pollinators and often provide control of other insect populations, as well. So including these flowers as a resource is likely to produce multiple types of benefits on a farm.

We note that some other flowers often included in pollinator plantings appeared to be of little value, being visited by small numbers of insects or only by common generalist species (sometimes only by the non-native western honeybee). Zinnias and marigolds fell into this class, along with *Alyssum*. These flowers may offer aesthetic value, probably do no harm ecologically, and may serve as a resource for some pollinators under some conditions. But our observations suggest they are much less valuable to pollinators than the plants discussed above.

## Next Steps

We will continue to maintain and monitor the project plot plantings through the end of the growing season. In particular, we'll be curious to see what turns up on any asters and goldenrods that bloom in the project plots. By the season's end, we will assess the status of the plantings and begin making arrangements to refresh or augment the plantings next spring (e.g., trying again with butterfly weed).

During the autumn, we will be offering to assist farms in conducting a general assessment of their ecological condition using a simple, qualitative protocol developed by the Xerces Society. These assessments, which take about two hours to conduct plus another hour or two to finalize results, are totally optional but may help farms identify both ecological strengths and deficiencies.

We will prepare a season-end report building on this interim document and, if there is sufficient interest, set up a gathering in late fall or early winter to review the report, compare results, and discuss the future direction of the project.

In the meantime, thank you again for your cooperation on this project, and we wish you a productive and successful growing season!



# Additional Resources

- Attached is a copy of our project tracker which identifies all bee types found on farms/project plots and where specifically each type has been documented.
- To upload observations from your farm into iNaturalist, join the MV Pollinator Pathway projects on iNaturalist which can be found [here](#) or by searching MV Pollinator Pathway under "Projects" on iNaturalist.
- For Matt Pelikan's iNat 101, a beginners guide to using iNaturalist, see the webinar at [this link](#).
- For more on the Martha's Vineyard Atlas of Life and to contribute sightings visit the MVAL website click [here](#).



Metallic sweat bee  
Agapostemon sp