

Initiating Pollinator Stewardship in the Nursery, Landscape and Garden Center

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The Green Industry benefits from services provided by pollinating insects because plants bearing fruit at garden centers are often preferred by retail customers. Also, pollinators help urban landscapes thrive by fostering berry and other fruit production that assist in supporting wildlife (Figure 1). Therefore, recognizing the many types of pollinators and identifying practical ways to support them is good for pollinators, good for your clients and good for your business!



Figure 1. American robins rely on hawthorn (*Crataegus* spp.) fruit, along with other fruit and insects, to survive and reproduce, and in turn they disperse seeds within the fruit. Photo credit Laura Russo.

Pollination is an **ecosystem service** valued at billions of dollars in estimated labor, production costs and improvements in crop yield every year. Pollination allows plants to produce seeds and fruit, which is not only essential for plant reproduction and landscape aesthetics, but also supports wildlife in urban and natural landscapes. More than 200,000 animal species, including bees, butterflies, bats and birds, can act as pollinators by moving pollen between flowers (Figure 2).

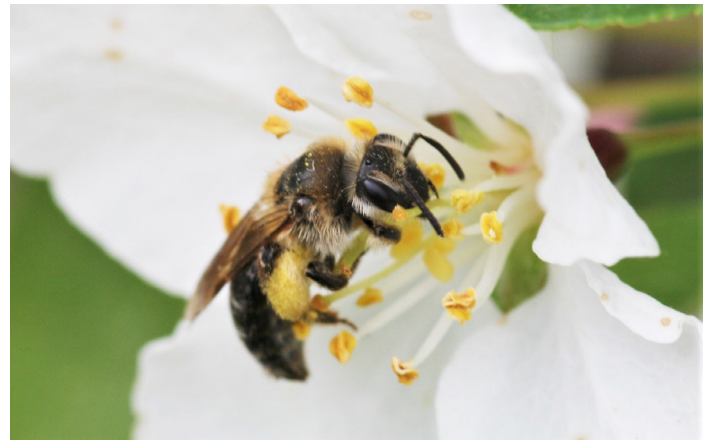


Figure 2. Mining bees (*Andrena* spp.) are important pollinators of apple (*Malus* spp.) flowers. Photo credit Laura Russo.

These species serve a crucial role in the pollination process for nearly 90 percent of all flowering plants. In the United States alone, pollinators contributed to agricultural products worth \$24 billion. Understanding and adopting pollinator-safe practices during nursery production and in managed landscapes and retail settings has wide-reaching implications for the Green Industry.

Ecosystem Services

Definition: Free services performed by organisms in the natural environment and functioning ecosystems that positively affect human health and well-being. The four main categories are producing (e.g., food and water); regulating (e.g., reducing/preventing flooding); supporting (e.g., nutrient cycles, generating oxygen for animals to breathe); and cultural (e.g., spiritual connections, recreation).

The relationship between managed plants and the pollinating insects that visit their flowers entered the public eye following some highly publicized bee deaths that appeared to be connected to a pesticide application or misapplication. The increase in public awareness that ensued created a more engaged consumer body. Events such as these where an application or misapplication of an insecticide causes large-scale bee deaths have the potential to lead to tighter restrictions on pesticides and can change market demand for plants treated with certain pesticides during production. Under these circumstances, all members of the industry who use insecticides responsibly still bear the cost of a few members who misapply a product and cause large-scale or very visible harm. Additionally, businesses that use products or practices that aren't aligned with bee health may develop a negative public image, whereas those adopting bee-friendly practices can help reach Green Consumers, customers who weigh environmental impact when making purchasing decisions. Therefore, it is "bee-smart" and business smart to use responsible management practices! By using appropriate pesticide application practices and adopting and fostering other bee-friendly practices, growers, landscape contractors and retail operators can develop a competitive advantage through stewardship of bees and other pollinators.

Did You Know?

The Advanced Tennessee Master Nursery Producer Program has modules on Understanding Green Consumers, IPM and Pollinator Protection. See the References and Additional Resources section for more information on this program.

General Pollinator Support Practices for the Green Industry

There are several pollinator-friendly practices that the Green Industry can adopt that do not require new equipment or changes to production or maintenance systems. Adopting these practices only requires awareness and small changes to existing operations so that land is managed in a way that also benefits pollinators.

Managing pesticide use: One way to promote pollinator survival is by limiting or refining the use of pesticides, particularly when plants are in bloom. Most insecticides do not distinguish between pollinators and other beneficial insects and those that are pests, so while the application of these products is intended to kill the targeted insects, it may also kill pollinators. Studies have shown that the application of pesticides and herbicides can sometimes lead to chemicals becoming concentrated in the pollen and nectar of plants during bloom periods. The contaminated pollen and nectar can then be consumed by pollinators and can harm their health.

To limit the number of pollinator deaths, the use of nonchemical solutions should be considered. If a pesticide must be used, select a product that is considered safer for bees and other pollinating insects. Some insecticides are known to be particularly toxic to bees and should be avoided or used with extreme caution. For example, some pesticides

in the neonicotinoid family, such as clothianidin, dinotefuran, imidacloprid and thiamethoxam, have labels that contain a bee box, highlighting their potential to harm pollinating insects (Figure 3). A way to limit the use of pesticides is by focusing on critical control points to prevent large-scale outbreaks of pest populations from occurring in the first place. Buying clean, pest-free plants, inspecting all incoming plants, and monitoring plants regularly can minimize pest problems and the need to apply pesticides. UT's resources on systems-based pest management have more information on preventing pest introduction. Links are provided at the end of this publication.

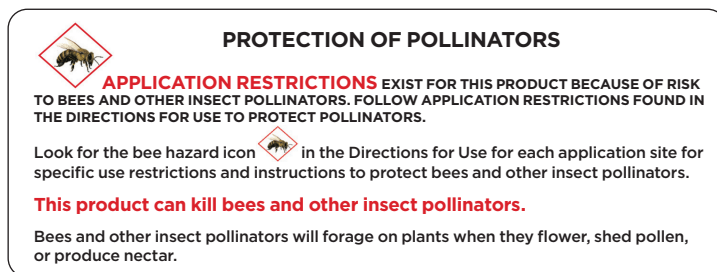


Figure 3. Some pesticide labels contain a bee box that illustrates the caution that must be exercised to safely use the product.

Reducing habitat loss: One major driver of the decline in pollinators is loss of habitat, so one of the most direct ways to promote pollinator survival is by allowing flowering weeds to grow in the buffer zones and borders of production fields that are not sprayed. Another option is to seed field borders, fallow fields or sections of landscapes with a flowering cover crop, such as clover, or wildflowers and other annual and perennial plants, to create habitat that will support beneficial insects (Figure 4). This not only promotes a safe refuge from mowing and pesticide applications, but also provides flower-visiting insects with a reliable source of pollen and nectar for survival. It also can encourage pollination and seed set or fruit yield of crop plants. Conversely, in driveways and in production blocks, growers may want to use cover crops that will not bloom before being turned under or that can be mowed to prevent bloom since these areas are exposed to pesticide applications and may inadvertently expose pollinators that are visiting cover crop blooms to insecticides.

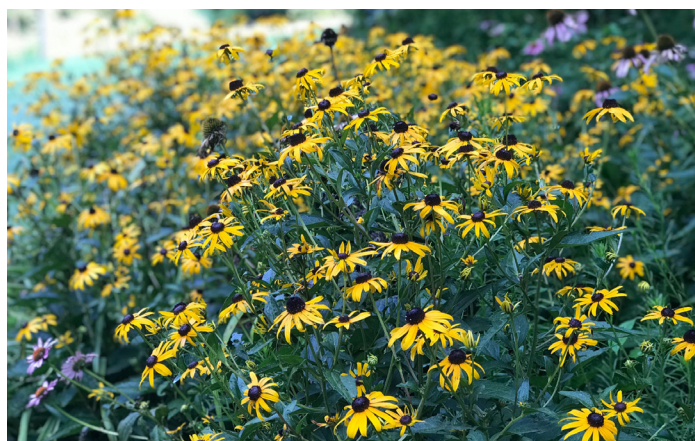


Figure 4. Black-eyed Susan (*Rudbeckia fulgida*) is a pollinator-friendly native plant that can be planted in buffer zones or in landscapes to help support beneficial insects, including pollinators. Photo credit Amy Fulcher.

Highly cultivated ornamental plants present divergent challenges. Recently, they have been bred to reduce or eliminate seed production in an effort to reduce unwanted reseeding. Breeding objectives that reduce pollen production can inadvertently reduce food sources for pollinators. Regardless, these plants may still produce nectar and attract nectaring pollinators, which can be exposed to pesticides in the flower nectar. Therefore, careful consideration before pesticide use is still important.

Pollinator tips for all sectors of the Green Industry:

- Foster development of school- and community-based pollinator gardens.
- Learn about native pollinators to better provide individual pollinator needs.
- Utilize a variety of plants that provide pollen and nectar throughout the year to create more diverse and ecologically healthy environments.
- Offer native and/or wild-type flowering plants that produce nectar and pollen.
- Support local beekeepers and organizations that research or promote pollinator health.

Specific Pollinator Support Practices for the Green Industry

The following include specific practices and strategies that retail, nursery and landscape businesses can incorporate into their daily tasks and share with their customers. These tips provide a range of options for promoting pollinators, regardless of type of business, space or resources.

Garden Centers: In the retail industry, providing customers with literature on the importance of pollinators and engaging suppliers in conversation regarding the importance of pollinator-safe practices can be one of the most impactful ways to promote pollinator health. By creating signage describing these pollinator-friendly practices and keeping low- and no pesticide use plants available in inventory to choose from, customers can make informed plant choices. Other impactful ways to promote pollinator-friendly strategies are to offer discounts on pollinator-friendly plants, such as coneflowers (*Echinacea* spp.), each week (Figure 5). In addition to offering discounts, emphasizing the importance of pollinators during gardening workshops and when hosting school groups are other fun ways to promote stewardship and educate the public.

Nurseries: Reducing, refining or eliminating the use of pesticides on plants where possible, especially when plants are in bloom, will help protect pollinators from accidental exposure. Adopting Integrated Pest Management practices can help protect beneficial insects, reduce risk to employees, and save money through more efficient and effective pesticide application. IPM practices include spraying only those plants with a pest problem of economic significance and only when the pest is at a vulnerable life stage, thereby limiting pesticide applications to only those applications that are likely to be

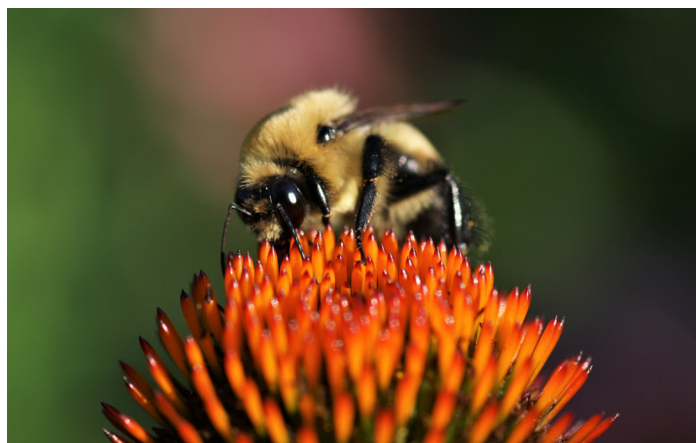


Figure 5. *Coneflowers (Echinacea spp.) are a popular choice for both the consumer and pollinators! Photo credit Laura Russo.*

effective and efficient. “Calendar spraying” and otherwise repeatedly spraying broad spectrum insecticides to the whole crop inventory can be harmful to pollinators and is also a wasteful, and thus costly, approach to pest control. An IPM approach also includes using the least toxic product to achieve the necessary control, which reduces exposure risk to beneficial insects and nursery employees. Another strategy is to target pesticide applications to the relevant plant part, for example, by closing sprayer nozzles to only spray tree canopies, not trunks, for certain pests. Directed sprays, such as those that are applied with a hand wand, can also focus applications on the intended part of the crop plant. Similarly, using laser-guided spray technology to sense the plant’s presence and its characteristics can greatly reduce nontarget application and drift, which can reduce the potential for accidental pollinator exposure (Figure 6).



Figure 6. *A native pollinator, a green sweat bee (Augochloropsis metallica), forages from a blooming native perennial, common boneset (Eupatorium perfoliatum). Reducing insecticide drift from production fields to nearby flowering plants reduces exposure risk for pollinators. Photo credit Laura Russo.*

Landscapes: Communicating with clients and using products and plants that fit their preferences, for example, by promoting pollinator-conservation, could be sound business for landscape contractors. For properties that are in service contracts, decreasing, substituting or eliminating the use of pesticides that are considered harmful to bees and other pollinators may help to protect pollinator populations in landscapes while also appealing to clients interested in pollinator-friendly

practices. If trees or shrubs have insect, mite or disease problems that need to be treated with a pesticide, select a time of day with no wind. If the application must be made when there is a light wind, cover nearby flowering plants with an opaque tarp to prevent the pesticide from drifting onto the plants in flower. Another option to support pollinators is to supplement landscapes with flowering plants to increase floral resources. Or, provide pollinator havens by planting attractive flowering species near ornamental ponds and natural streams to allow access to fresh water, pollen and nectar. Where it is not possible to grow a diversity of native wildflowers on the landscape, using a ground cover, such as clover (Figure 7), in certain areas can provide access to nectar and pollen sources to support some types of pollinators. When landscapes are designed for newly constructed homes, a pollinator-friendly plant pallet and maintenance program could be presented that includes several of the features described in this publication.

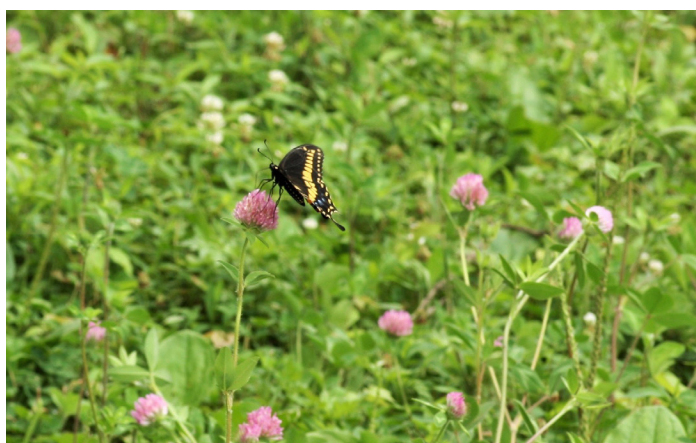


Figure 7. Clovers (*Trifolium* spp.) are a great cover crop and provide pollen and nectar to some pollinating insects. Photo credit Laura Russo.

There are resources available to members of the Green Industry who are seeking more information about protecting pollinators. The U.S. Natural Resource Conservation Service offers publications on how farmers can provide pollinator habitat, and some plantings to conserve pollinators will qualify

for funding from the NRCS's Environmental Quality Incentives Program, known as EQIP. "Best Management Practices for Bee Health in the Horticultural Industry," published by the Horticulture Research Institute, focuses on bee safety and management. This pamphlet is a reliable resource that can be utilized by landscapers, nursery owners and retail employees to ensure that safe and sustainable bee management practices are followed. For more resources, see the references and additional resources section at the end of this publication.

These tips act as a great starting point for Green Industry businesses becoming more pollinator friendly. Understanding the importance of pollinators, making pesticide applications in a way that minimizes risk to bees and other pollinators, and by fostering pollinator-friendly habitats, the Green Industry can help maintain healthy pollinator populations in their communities.

For more information, retailers, landscapers and nursery producers can contact their county UT-TSU Extension office. To find your county office click here:

<https://extension.tennessee.edu/Pages/default.aspx>

National Pollinator Garden Network (NPGN)

The NPGN created the Million Pollinator Garden Project to increase the number of pollinator-friendly landscapes. Between 2015 and 2018:

- >1,000,000 registered gardens
- >8,000,000 people participating
- >5,000,000 acres of pollinating habitat created

Check the References and Additional Resources Section to learn more about how your business can support the National Pollinator Garden Network.

<http://millionpollinatorgardens.org/partners>

References and Additional Resources:

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These tips are partially adapted from the Horticulture Research Institute's "Grow Wise Bee Smart: Best Management Practices for Bee Health in the Horticulture Industry" pamphlet. For more information, please visit the Grow Wise Bee Smart website: <http://growwise.org>.



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