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# Conservation of native and domestic pollinators in managed turfgrass landscapes

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The ecological and economic services that bees and other pollinating insects provide are invaluable. Almost 85% of the world's flowering plants depend on pollinators to reproduce. Unfortunately, we are losing these important services due to an alarming decline in pollinating insects across the world. These losses in population and biodiversity are potentially being driven by a combination of interacting factors, including habitat loss, diseases, parasites, and insecticide exposure. Consequently, finding ways to promote and preserve pollinators is of utmost importance for homeowners and for professional landscape managers. If you wish to be a proactive part of pollinator conservation, you can do so through two simple practices.

## Use insecticides correctly

Insecticides can be lethal to pollinators or can induce non-lethal negative effects, such as memory loss, weakened immune systems, and loss of queen production. While nearly all insecticides can harm bees, most of the attention has focused on the neonicotinoid class of products. Neonicotinoids ("neonics" for short) are the most widely used class of insecticides in turf and other agricultural systems, and there are many different active ingredients in this class (see table below). In cultivated turfgrass plantings, neonics are mainly used for preventive management of white grubs.

**Common chemical and trade names for neonicotinoid products for managed turfgrass and homeowner uses.**

| Chemical name | Example trade names |
|---|---|
| Clothianidin | Arena |
| Dinotefuran | Safari, Zylam |
| Imidacloprid | Bandit, Mallet, Merit, Zenith, Complete Brand Insect Killer for Soil & Turf, Season Long Grub Control |
| Thiamethoxam | Meridian |

**Note:** Insecticide trade names and/or ingredients may change over time. It is always the responsibility of the applicator to check the active ingredients of a given product and to follow all directions on the label.

When we treat turf with insecticides, flowering weeds may also be present (figure 1). While plants such as white clover and dandelion are considered a nuisance to some, they serve as pollen and nectar resources for nearly 50 different kinds of pollinating insects.[1] If we create a situation where flowering weeds are oversprayed with insecticides, many species of pollinators could be at risk. It is of the utmost importance that pesticides are applied appropriately and with caution when working around weedy flowering plants. There are several options when managing turf to ensure you minimize chances to harm pollinators:

- If blooming weeds are abundant, one consideration is to use an herbicide to control the weeds before you apply an insecticide. Turf areas that are largely devoid of weeds should pose little risk to pollinators, even if a neonicotinoid insecticide is applied.
- Mow the turf area immediately before spraying a liquid formulation of an insecticide. Mowing should remove more than 90% of the flowers, reducing the number of bees foraging in that area. Neonicotinoids are systemic insecticides that are absorbed by plant roots. However, these residues are typically transferred to plant leaves rather than into nectar and pollen. As a result, flowers that grow after mowing and application do not contain hazardous levels of neonicotinoids.[2]
- If you can't control the weeds or blooms in an area, consider using granular or pelleted (spreadable) insecticide formulations. Granular or pelleted products will go directly into the soil following irrigation, leaving no residues in the flowering portion of the plant.
- Turf managers could also consider using a more "bee-friendly" type of insecticide. For example Acelepryn©, an anthranilic diamide, has been shown to have no adverse effects on pollinators that ingest it.[3]

More field realistic research is needed to gain a comprehensive understanding of the relationship between neonicotinoids and other insecticides, and their influence on native and domestic pollinators. In the interim, it is imperative that the turfgrass industry considers commonsense approaches in order to minimize potential hazards to bees. If, as an industry, we are proactive and implement simple stewardship practices that safeguard pollinator health, we can ensure these tools will be available to us for the foreseeable future.

## Improve pollinator habitats

Both general homeowners and turfgrass managers can help create habitat for pollinators by converting portions of their turf to pollinator sanctuaries and floral resources. Golf courses are especially well suited for this, as they may provide a large fraction of the green space in otherwise urbanized areas. To provide the best possible habitat for the bees and other pollinators in your area, plant a mixture of native flowering plants. Doing so helps in two key ways: First, the mixture ensures that pollinating insects with differing food preferences will have a variety of plants to choose from. Second, by having a mixture of flowering plants, there will be plants in bloom

**FIGURE 1. A lawn with blooming weeds can serve as an attractive floral resource for many species of pollinating insects. Care must be taken to follow label precautions to avoid harming these important insects.**

throughout the growing season to provide resources to pollinator species that may be present at different times of the year. Contact your local university Extension service to learn which flowering plants are suitable for planting in your area. In addition, the Pollinator Partnership offers free planting guides tailored to specific parts of the country (**www.pollinator.org/guides**).

Another key task when creating pollinator sanctuary is providing nesting sites for visiting insects. Sites can be provided for butterflies and moths by planting certain herbs or plants that adults prefer for egg laying. You can learn more about caterpillar food preferences online (**https://store.extension.iastate.edu/Product/Iowa-Butterfly-and-Caterpillar-Food-Preferences-Reiman-Gardens**). For bees, you can construct or purchase pollinator dwellings. Dwellings may include a hollow void in which bumble bees can nest, or they may house a bundle of hollow sticks or have holes drilled into a wood block that mason and leafcutter bees can use for egg laying.

For more information on pollinator dwellings, please refer to the Xerces Society's guide (**www.xerces.org/wp-content/uploads/2008/11/nests_for_native_bees_fact_sheet_xerces_society.pdf**).

It is our responsibility as homeowners and as a professional industry to make a conscientious effort to implement best management practices that will minimize potential negative impacts on pollinators. In addition, it is important for us to realize that our turf environments and urban areas can contribute to pollinator conservation efforts if the time is taken to create sanctuary for these insects. By ensuring that we follow label regulations and are contributing to overall pollinator protection measures, we can provide people with aesthetically pleasing lawns, golf courses, and sports fields, while also doing so in environmentally responsible ways.

## References


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