

Appendix 4: The Cropland Working Group Best Management Practices

Kansas Cropland Best Management Practices for Monarchs and Native Pollinators

Cropland acres in Kansas play a large role in the management and recovery of Monarch Butterflies and native pollinators. As a component of the Kansas Monarch Conservation plan, our Best Management Practices (BMP's) as outlined in this document aim to maintain, enhance, and create suitable habitat for Monarch Butterflies within working cropland systems. The priority is to keep “working lands working,” while still identifying opportunities to be good stewards of current habitats, cropland, and the recovery of native pollinators. The following BMP's are outlined into five major areas of best practices.

1. Identify opportunities to create habitat.

By creating new habitat for native pollinators, you provide the resources necessary for monarchs to produce successive generations in the spring and sustain their migration south in the fall. Additional habitat will beautify your farmstead and decrease mowing efforts.

Creating New Habitat

- Where?

- Near current structures or old farmsteads
- Gardens and landscaping
- Along roadways or ditches
- Brushy or wooded areas
- Field edges and buffer strips
- Grassed waterways
- Plant on unproductive pieces of current cropland
- Around ponds or irrigation lakes
- Riparian corridors and creeks

- How?

- Purchase established plants from a reputable native plant nursery close to home or collect seeds from native plant prairies near your home.
- Avoid digging up native plants from the wild. Often this is illegal and most mature plants will not survive transplanting.
- For a list of local plant and seed sources visit Kansas Native Plant Society website.
- A combination of early, middle and late blooming species with overlap in flowering times will fuel pollinators and butterfly during breeding and migration.

- Continuous Management

- Avoid the use of insecticides in or surrounding your pollinator habitat.
- Mowing should be limited and carefully planned
 - Untimely mowing can result in high levels of insect mortality.
 - Mowing also destroys landscape features that provide structural diversity and may impact nesting areas used by pollinators.

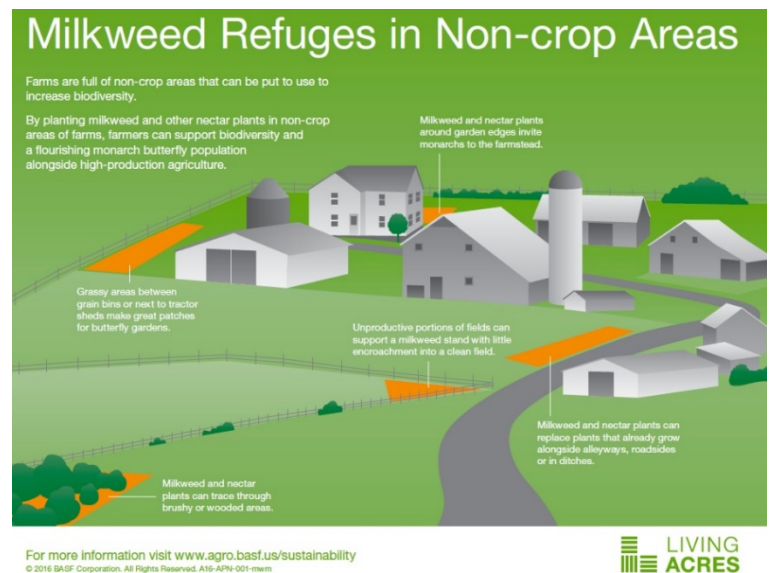


Image courtesy of BASF Corporation

- Consider registering your habitat!
 - o It is important that your conservation efforts are documented to show what is being done to help conserve the Monarch Butterfly. While your efforts through the Farm Service Agency (FSA), Natural Resource Conservation Service (NRCS), Fish and Wildlife, and non-governmental organizations will be accounted for within their programs; smaller plots that you do on your own, can be registered (if you choose) through one or more of the following programs:
 - Monarch Joint Venture, Monarch Conservation Map
<https://monarchjointventure.org/our-work/monarch-conservation-efforts-map>
 - Monarch Watch, Monarch Waystation registry
<https://www.monarchwatch.org/waystations/certify.html>
 - U.S. Fish and Wildlife Service, Monarch Conservation Database
<https://www.fws.gov/savethemonarch/MCD.html>

Funding Opportunities

Various government programs exist to aid in creation and continuation of Monarch and native pollinator habitat. These programs are listed below.

- Conservation Reserve Program (CRP)
 - o Offers a yearly rental payment to farmers who enroll and agree to remove environmentally sensitive land from agricultural production and plant species that improve environmental health and quality. Contracts are 10-15 years in length. Learn more by contacting your local County FSA office.
 - o Through CRP, the Pollinator Habitat Initiative and its associated practice, *CP-42 Pollinator Habitat*, is specifically designed to provide better access to nutrition for pollinators.
- Natural Resources Conservation Service (NRCS)
 - o Offers technical and financial assistance to help landowners plan, implement, and manage monarch habitat on farms, ranches and forests. Learn more by contacting your local County NRCS office.
 - o Environmental Quality Incentives Program (EQIP)
 - o Conservation Stewardship Program (CSP)
 - o Regional Conservation Partnership Program (RCPP)
- Kansas Partners for Fish and Wildlife Program (USFWS)
 - o Assists private landowners to restore, enhance, and develop thousands of acres of highly functional wetland, grassland, and woodland habitats throughout the state.
- Non-governmental Organizations (NGOs)
 - o Many NGOs such as Pheasants Forever, are involved in innovative partnerships such as the Bee & Butterfly Habitat Fund. This assists in funding efforts to restore forage and breeding habitat for the iconic butterfly within its primary migration corridor

2. Implement Integrated Pest Management (IPM) Practices in Farmed Acres.

Integrated Pest Management is an effective and environmentally sensitive approach to pest management. According to the Environmental Protection Agency (EPA), IPM is not a single pest control method but a series of pest management evaluations, decisions and controls.

Creating an IPM

1. Set Action Thresholds – Before taking any pest control action, set an action threshold. This is a point at which pest populations or environmental conditions indicate that pest control action must be taken. Sighting a single pest does not always mean control is needed. The level at which pests become an economic threat is critical to guide pest control decisions.
2. Monitor and Identify Pests – Not all insects, weeds, and other living organisms require control. Many organisms are innocuous and even beneficial. Monitor pests and identify them accurately, so that appropriate control decisions can be made.
3. Prevention – As a first line of pest control, aim to manage the crop from becoming a threat. This may mean using methods such as crop rotation, selecting pest-resistant varieties, and planting pest-free rootstock. These control methods can be very effective, cost-efficient and present little to no risk to people or the environment.
4. Control – If monitoring, identification, and action thresholds indicate that pest control is required, IPM programs then evaluate the proper control method. Effective, less risky pest controls are chosen first, including highly targeted chemicals, such as pheromones to disrupt pest mating, or mechanical control, such as trapping or weeding. If further monitoring, identification and action thresholds indicate controls are not working, then additional pest control methods would be employed, such as targeted spraying of pesticides. Broadcast spraying of non-specific pesticides should only be considered as a last resort.

3. Be a Pesticide Steward.

Pesticides are a vital tool in agriculture and the ability to utilize them must be maintained. Pesticide stewardship is necessary to maintain, enhance and expand Monarch habitat in Kansas. Pesticide stewardship begins with reading and following the label, knowing which insecticides are toxic to Monarchs and other pollinators, and proper application practices.

Good Practices

1. Follow label instructions every time a pesticide is used
 - o Label restrictions are legally binding. Many pesticide labels have advisory Environmental Hazard statements and/or compulsory directions for use specific to pollinator protection. Be aware of label instructions.
2. Use insecticides that selectively target the pest of concern
 - o When effective and economical chose an insecticide that has lower toxicity profiles for bees and other pollinators or have residues that are toxic for shorter durations.
3. Take steps to reduce or avoid pesticide drift
 - o Avoid spraying near areas with flowering vegetation and actively foraging pollinators.
 - o Check the weather forecast prior to application and avoid applying during high winds or temperature inversions.
 - o Select spray nozzles that adhere to label recommendations and requirements and keep them in top working condition with regular cleaning, adjusting, and replacing.
 - o Use appropriate level of pressure on a well-calibrated and maintained sprayer. Reducing pressure and increasing droplet size (where possible) can reduce drift.
4. Delay pesticide applications until monarchs and other pollinators cease foraging for the day
 - o Typically occurs in early evening, e.g. 6:00-8:00 PM during summer months
5. Consider seed treatment technologies

- Delivers a precise application, shielding seeds from insects and diseases that exist in the soil during their early developmental stages
- Decreases the number of broadcast spray applications of non-specific insecticides lessening potential exposure to Monarchs and other pollinators.
- It is important to note that seed treatments, especially Neonicotinoid seed treatments, be used sparingly, since they may be harmful to pollinators. In certain high-risk situations such as fields with a known, harmful insect population, seed treatment may be unavoidable.

4. Manage Blooming Crops for Monarchs and Other Pollinators.

We all know that cover crops can reduce soil erosion and the costs of fertilizer, herbicides and insecticides while increasing soil health. They also can be managed for the specific benefit of Monarchs, other native pollinators and wildlife.

Cover Crops to Consider:

- Diverse mixes of flowering broadleaves are best for pollinators and can provide excellent nectaring opportunities when terminated past peak bloom (when practical).
- Buckwheat, sunflower, canola, clovers and others not only suppress weeds but enhance pollinator habitat when allowed to bloom.

Maintenance of Cover Crops:

- Terminate winter cover crops with grazing as this will allow maximum habitat and build soil organic matter.
- Terminate crops with as little physical disturbance as possible to benefit pollinators.
- One of the most useful online tools for evaluating cover crop options for specific situations and locations is the Midwest Cover Crops Council Decision Tool, <http://mccc.msu.edu/selector-tool/>

Growing Alfalfa:

- Any alfalfa grower will tell you that fields of blooming alfalfa attract butterflies, but alfalfa too, can be managed for the betterment of Monarchs and other pollinators.
- When the Monarch migration is passing through Kansas (north in spring and south in the fall), consider harvesting at late bloom, especially during the month of September in Kansas. This will provide excellent nectaring opportunities for Monarchs and greater energy reserves in the roots.
- Consider growing reduced lignin varieties, which better maintain forage quality at later harvest dates. These alfalfas provide growers the flexibility to delay harvest, maximizing both yield and nectar potential, while maintaining forage quality.
- Practice Integrated Pest Management (see above). Focusing on maintaining populations of “beneficial insects” and suppressing pest populations below the economic injury level (EIL) rather than broadcast spraying of non-specific insecticides.

5. Be aware of local Beekeeper Hives and inform them of your planned management activities.

Open communication is the basis for understanding where managed pollinators are in relation to cropland. Growers and applicators can take specific steps to reduce potential impacts to colonies if they know where these colonies are located.

How to Identify:

- Utilize the Driftwatch website to locate beehives that may be near your location, <https://ks.driftwatch.org/map>
- Check with beekeepers for locations of local hives and repeat this process annually as beekeepers may change locations of hives.

Methods to Inform:

- Communicate planting activities to neighboring beekeepers when practical and be aware of beehives adjacent to the planting area.
- Keep local beekeepers contact details nearby.
- Give at least 24 hours' notice of spraying and provide the name and active ingredient of product being used.
- Appreciate that beekeepers are facing a tough challenge to keep their honeybee colonies alive and productive.
- Always follow the label directions and avoid spraying any plants where bees, Monarchs or other pollinators may be foraging or areas that could be attractive to bees.

General FAQ's

- Why should I consider turning less productive areas of my cropland into monarch and native pollinator habitat?
 - o While there may be concern with the reduction in acres, your average profitability per acre farmed may increase. The cost and inputs for farming less productive acres is often greater than net income, resulting in a loss per acre. This is often due to inefficiencies such as excessive turning in small fields and odd shaped corners as well as reduced yields due to trees, hedge rows, and poorer soils.
 - o By converting these less productive acres to Monarch habitat, you can focus your efforts on your most productive land while at the same time, doing your part to help reverse the dramatic Monarch population declines.
 - o Ultimately as a grower, you must identify which areas you deem unproductive and determine overall costs and benefits.
- How can I identify less productive areas of my field?
 - o Utilizing your yield monitoring maps and other computer applications can be useful in identifying these lesser productive areas.
- Can native habitats help with water quality issues on my cropland?
 - o Monarch habitat provides the added benefit of improving water quality. Native grasses and wildflowers have extensive root systems which are more effective at holding water in the soil profile than non-native species.

Additional Resources

Conservation Reserve Program (CRP), <https://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/index>

CRP Pollinator Habitat Initiative, https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdfiles/FactSheets/2015/CRPPProgramsandInitiatives/Pollinator_Habitat_Initiative.pdf

Working Lands for Monarch Butterflies, Natural Resources Conservation Service
https://www.nrcs.usda.gov/wps/PA_NRCSCConsumption/download?cid=nrcseprd1369640&ext=pdf.

Best Management Practices for Pollinator Protection in Field Corn, National Corn Growers Association https://www.ncga.com/file/1650/HBHC_Corn_030119.pdf.

Pesticides and Bees, Kansas State University Research and Extension (KSRE)
<https://www.bookstore.ksre.ksu.edu/pubs/MF3428.pdf>

Creating and Managing Habitat Resources

Monarch Butterfly: Small-Scale Habitat Development in Kansas, KSRE <https://www.bookstore.ksre.k-state.edu/pubs/MF3290.pdf>

Growing Milkweed in Non-Crop Areas to Benefit Monarch Butterfly, BASF
<http://www.agro.basf.us/sustainability/living-acres-milkweed-brochure.pdf>

The Kansas Native Plant Society, <http://www.kansasnativeplantsociety.org/gardening.php>

Mowing: Best Practices for Monarchs, Monarch Joint Venture
<https://monarchjointventure.org/images/uploads/documents/MowingForMonarchs.pdf>

Integrated Pest Management Resources

Integrated Pest Management Principles, Environmental Protection Agency
<https://www.epa.gov/safepestcontrol/integrated-pest-management-ipm-principles>

Integrated Pest Management and Wildlife, Natural Resources Conservation Service
https://efotg.sc.egov.usda.gov/references/public/SC/IPM_for_Wildlife.pdf, along with the NCGA's [IPM document](#)

North Central Integrated Pest Management Center
<https://www.ncipmc.org/>

Kansas State University (KSU) and KSRE Publications

- *KSU Integrated Pest Management*, <http://www.k-state.edu/pesticides-ipm/integratedpestmanagement.html>
- *KSU Facts & Information on Crop Pests in Kansas*, <http://entomology.k-state.edu/extension/insect-information/crop-pests/>
- *KSRE Alfalfa Insect Management*, <https://www.bookstore.ksre.ksu.edu/pubs/MF809.PDF>
- *KSRE Corn Insect Management*, <https://www.bookstore.ksre.ksu.edu/pubs/MF810.pdf>
- *KSRE Cotton Insect Management*, <https://www.bookstore.ksre.ksu.edu/pubs/MF2674.pdf>
- *KSRE Sorghum Insect Management*, <https://www.bookstore.ksre.ksu.edu/pubs/MF742.pdf>
- *KSRE Soybean Insect Management*, <https://www.bookstore.ksre.ksu.edu/pubs/MF743.pdf>

- *KSRE Sunflower Insect Management*, <https://www.bookstore.ksre.ksu.edu/pubs/MF814.pdf>
- *KSRE Wheat Insect Management*, <https://www.bookstore.ksre.ksu.edu/pubs/mf745.pdf>

Pesticide Stewardship Resources

Pesticide Stewardship Website <https://pesticidestewardship.org/>

The Guide to Seed Treatment Stewardship, https://seed-treatment-guide.com/wp-content/uploads/2018/02/Seed-Guide_Farmers_fixed.pdf

EPA Pollinator Protection, <https://www.epa.gov/pollinator-protection>

Syngenta Practicing Responsible Pesticide Application, <http://www.syngenta-us.com/practicing-stewardship/responsible-pesticide-application>

University of Nebraska-Lincoln, Protecting Pollinators from Pesticides, <https://entomology.unl.edu/scilit/Protecting-pollinators-from-pesticides.pdf>

University of Georgia, Protecting Pollinators from Pesticides, <http://www.caes.uga.edu/departments/entomology/research/honey-bee-program/bees-beekeeping-pollination/pollination/pollination-protecting-pollinators-from-pesticides.html>

Cover Cropping Resources

Cover Cropping for Pollinators and Beneficial Insects, Sustainable Agriculture Research and Extension <https://www.sare.org/Learning-Center/Bulletins/Cover-Cropping-for-Pollinators-and-Beneficial-Insects>

Cover Crop Economics, Sustainable Agriculture Research and Extension <https://www.sare.org/Learning-Center/Bulletins/Cover-Crop-Economics>

Cover Crops and Pollinators, Natural Resources Conservation Service https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs141p2_029229.pdf

Identifying Managed Pollinator Locations

Driftwatch Website, <https://ks.driftwatch.org/map>

**This document was brought to you by the
Kansas Monarch Cropland Working Group:**

