Practical Pollinator Support for Your Farm

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Mini-needs inventory: important factors for your production system

Use this as a guide to identify what is important to you in deciding to implement more pollinator support on your farm. This will help identify why you want to try a pollinator support method so that you can assess your success later. This will also help identify major production considerations that will determine what practices are feasible for your farm.

Interests and goals					
I want to see more quantity and diversity of pollinators on my farm.	Not at all important	Not very important	Somewhat important	Very important	The most important
I want to enhance my enjoyment of my farm's natural beauty.	Not at all important	Not very important	Somewhat important	Very important	The most important
I want to boost my crop yield, or I'm seeing crop defects due to not enough pollination.	Not at all important	Not very important	Somewhat important	Very important	The most important
I want to see more wildlife on my farm, like birds and mammals.	Not at all important	Not very important	Somewhat important	Very important	The most important
	Not at all important	Not very important	Somewhat important	Very important	The most important
	Not at all important	Not very important	Somewhat important	Very important	The most important
Production resources and considerations					
Constraints on land area available	Not at all important	Not very important	Somewhat important	Very important	The most important
Constraints on financial resources	Not at all important	Not very important	Somewhat important	Very important	The most important
Constraints on time and labor	Not at all important	Not very important	Somewhat important	Very important	The most important
Use only my existing equipment	Not at all important	Not very important	Somewhat important	Very important	The most important
Provide additional income opportunities	Not at all important	Not very important	Somewhat important	Very important	The most important
Boosting pest control	Not at all important	Not very important	Somewhat important	Very important	The most important
Weed pressure and management	Not at all important	Not very important	Somewhat important	Very important	The most important
	Not at all important	Not very important	Somewhat important	Very important	The most important
	Not at all important	Not very important	Somewhat important	Very important	The most important

Mini-habitat inventory: through the eyes of a bee

Use this as a guide to take stock of your existing assets and potential vulnerabilities for pollinators on your farm or site. It may be helpful to do this before and after implementing pollinator support methods and compare the scores. These scores are not a hard-and-fast rule and can't be fairly compared between sites, just meant to be a useful way to understand your assets and track your progress.

Resource	1	2	3	4	5	Score
Foraging						
Number of flowering crop species grown on farm	0-2	2-5	5-7	7-9	10+	
% of farm area in semi-natural habitat (woodlands, pastures and fields, wetlands)	0%	1-3%	3-6%	6-9%	10% +	
% of surrounding area (within ~1/2 mile) in semi-natural habitat	0-5%	5-15%	15-20%	20-30%	30% +	
Number of existing pollinator support features (ex. native trees and shrubs, native plant prairies, flowering cover crops)	0	1	2	3	4+	
Number of native flowering plant species on farm	0	1-3	3-5	5-10	10+	
Foraging subtotal						
Stability over time						
Number of blooming species in **spring** (Feb-May)	0-2	2-5	5-7	7-9	10+	
Number of blooming species in **summer** (June-Aug)	0-2	2-5	5-7	7-9	10+	
Number of blooming species in **fall** (Sept-Nov)	0-2	2-5	5-7	7-9	10+	
% of site that is tilled annually	90-100%	60-90%	30-60%	10-30%	0-10%	
% of natural areas on site that are developed annually (put into crop, built or paved on, etc.)	100%	80%	50%	20%	0-5%	
Stability over time subtotal						
Nesting habitat						
Frequency and type of tillage	Very frequent, deep	Frequent, deep	Occasional, deep	Frequent, shallow	Infrequent, shallow, or none	
Areas of bare ground or sparse vegetation	None	Scarce	Some	Moderate	Abundant	
Dead wood, brush piles, rock walls near crop areas	None	Scarce	Some	Moderate	Abundant	
Shrubs, grasses, woody plants where stalks are left over winter	None	Scarce	Some	Moderate	Abundant	
Nesting habitat subtotal						

Risk factors						
On-farm insecticide use	Frequent, conventional products	Less frequent, conventional products	Frequent, organic products	Less frequent, organic products	None	
Surrounding area insecticide use	Frequent, conventional products	Less frequent, conventional products	Frequent, organic products	Less frequent, organic products	None	
Herbicide, fungicide, etc. use (on-farm & surrounding)	Frequent, conventional products	Less frequent, conventional products	Frequent, organic products	Less frequent, organic products	None	
Risk mitigation factors: give 1 point for each practice used (or if not applicable)	Non-chemical pest control methods are used	Sprays are based on scouting threshold	Measures to prevent insecticide drift	Sprays don't occur during peak crop bloom	IPM plan in place	
Risk factors subtotal						
Total inventory score (add together subtotals)						

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Low barrier-to-entry methods

Method	Annual or perennial	Production system	Land area required	Costs	Labor	Effectiveness for pollinator support	Effect on crop yield	Multifunctional benefits	Drawbacks and mgmt considerations
Leave unharvested crops to bolt	Annual	Any	none Integrated into existing production	Start-up: none Maintenance: none	Start-up: none Maintenance: none	1 flower Adds attractive food resources Doesn't provide long-term habitat or food	neutral Crop harvest already completed	Seed harvest if wanted Benefits natural enemies	May create pest or weed explosion Don't use systemic insecticides Remove after flowering but before seed set Delays reusing area
Leave non-crop areas unmowed	Perennial	Any site with enough land area	none Uses non-crop areas	Start-up: none Maintenance: none	Start-up: none Maintenance: none	2 flowers Quality will vary Even grasses and flowering weeds provide some pollinator resources Provides permanent habitat and food	neutral to positive "Semi-natural habitat" like fields are among the best for pollinators	Labor saving Benefits other insect allies Wildlife habitat Beauty (depending on your taste)	May prevent recreational use of area Tick habitat Appearance Could increase weed pressure Mow paths for foot/ equipment traffic
Provide nesting habitat and water	Perennial	Any	none	Start-up: $ -- none Maintenance: $ -- none	Start-up: 1 shovel Maintenance: 1 shovel	3 flowers Provides resources that are often hard to find and may be limiting	modestly positive Boosts native bee population over time	Conserves other insect allies Make use of scrap/ waste materials Engage in teaching and learning about insects	Create with kids or volunteers Annual maintenance (bee hotels) or replacement over time Attracts stinging insects

Annual or perennial Does the system need to be replaced every year or does it persist on its own?

Land area required ● = low ●● = medium ●●● = high

Cost $ = low $$ = medium $$$ = high

Labor 1 shovel = low 2 shovels = medium 3 shovels = high

Effectiveness for pollinator support 1 flower = least support provided 5 flowers = most support provided

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Integrated into production methods

Method	Annual or perennial	Production system	Land area required	Costs	Labor	Effectiveness for pollinator support	Effect on crop yield	Multifunctional benefits	Drawbacks and mgmt considerations
Insectary strips	Annual	Best for smaller-scale market gardens, veg farms, high tunnels	● Use small areas of field Use margins or borders that aren't productive	Start-up: $ Maintenance: $-- none	Start-up: 1 shovel Maintenance: 1 shovel	3 flowers Provides quality food resources and can extend season, especially if diverse	**modestly positive** Facilitates pollinators into crop field without much distraction	Save seed to reuse or sell Cut flowers Benefits other insect allies Beauty and enjoyment	Work equipment around temporarily Self-seeding may cause weeds and be difficult to prevent due to staggered blooms
	Perennial			Start-up: $-- $$ Maintenance: none	Start-up: 2 shovels Maintenance: 1 shovel	4 flowers Provides quality and constant food and habitat for native bees			Work equipment around permanently Some species may spread slightly
Prairie strips	Perennial	Row crops	●● Takes area out of production but can site on underproducing areas	Start-up: $$$ Maintenance: $ --$$	Start-up: 3 shovels Maintenance: 2 shovels	3 flowers Good quantity of high-quality food and habitat Contiguous and permanent ⬇ Insecticide exposure risk	**neutral to positive** No competition or loss of yield Improves pollination within crop field	Erosion control Windbreak Grazing and haying Benefits other insect allies Wildlife Income from CRP	Monitor for invasive weeds Work equipment around (can drive on) Prevent overspray
Flowering cover crops	Annual	Any system using cover crops, including livestock	**none** Integrated into existing production	Start-up: $ $ Maintenance: none	Start-up: 1 shovel Maintenance: 1 shovel	3 flowers Good quantity of food resources May extend season ⬇ Low diversity	**it depends** Within-field can facilitate crop pollination Large areas may distract from crop	All benefits of cover cropping Benefits other insect allies Potential for trap cropping	Termination timing may be challenging to prevent seed set Trample/equipment traffic tolerance Prevent overspray Potential pest resources
Optimize production practices to mitigate harm	Annual	Any	**none** Integrated into existing production	Start-up: $-- $$$ Maintenance: $	Start-up: 3 shovels Maintenance: 1 shovel	3 flowers Very important to mitigate harm but usually doesn't enhance	**ideally neutral to positive** May have an initial yield dip before eventual gains	Conserves other insect allies Benefits soil health Reduces pollution	Suitable practices depend on existing production methods Some practices may require more labor/ equipment or reduce yields

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Ecosystem-level benefits

Method	Annual or perennial	Production system	Land area required	Costs	Labor	Effectiveness for pollinator support	Effect on crop yield	Multifunctional benefits	Drawbacks and mgmt considerations
Flowering hedgerows	Perennial	Any	●● Linear shape makes it easier to fit into site	Start-up: $ $ $ Maintenance: $ $	Start-up:  Maintenance: 	✿ ✿ ✿ ✿ Permanent high-quality food and habitat More effective with diverse and older plantings Linear connectivity like a “highway”	**positive** Improves pollination near hedgerow and as plants mature May distract pollinators during peak bloom Minimal competition with crop	Windbreak and shade Living fence Privacy and visual appeal Water and carbon capture Benefits wildlife	Work equipment around permanently Shrubs will need major maintenance in 20-30 years Prevent overspray Use evergreen hedge to shield from drift
Native plant meadows	Perennial	Any site with enough land area	●--●●● Can start small May use existing non-crop area or take fields out of production	Start-up: $$--$$$ Maintenance: **$-- none**	Start-up:  Maintenance: 	✿ ✿ ✿ ✿ ✿ “Gold standard” for diverse, permanent, and high-quality food and habitat Native plants especially support native pollinators	**positive** Boosts pollinator population over time Unlikely to support pests or distract pollinators	Benefits wildlife and other insect allies Beauty Citizen science and learning Water and carbon capture Income from CRP	Can take large area out of potential production Tick habitat Prevent overspray Monitor for invasive weeds Can site on marginal lands
Manage existing habitat	Perennial	Any site with existing forests, fields, riparian areas	**none** Integrated into existing non-crop habitat	Start-up: $--$$$ Maintenance: $$	Start-up:  Maintenance: 	✿ ✿ ✿ ✿ ✿ Natural habitat supports areawide pollinator populations Supports native species	**positive** Natural habitat surroundings improve crop yield	Benefits insect allies and other wildlife Beauty and recreation (hunting, fishing, birding, etc.) Citizen science Water and carbon capture Foraging for food, medicine, wood Silvopasture?	Certain pests (ex. birds, deer, SWD) may increase with natural habitat Be clear on your investment so you don’t use more resources than you intend

Resources for more information

Good resources for general information include the Xerces Society, Pollinator Partnership, NRCS and county extension agents, OAK, and other farmers/gardeners in your area.

Pollinator information	
Native bees	https://attra.ncat.org/publication/alternative-pollinators-native-bees/
Bee monitoring protocol	https://xerces.org/publications/identification-monitoring-guides/streamlined-bee-monitoring-protocol-for-assessing
Low barrier-to-entry methods	
Provide nesting habitat and water	https://www.xerces.org/publications/fact-sheets/nesting-overwintering-habitat
Ground-nesting bees and bare ground habitat	https://beecityusa.org/clear-space-for-bees-why-pollinators-in-your-yard-need-access-to-bare-ground/
Cavity-nesting bees and bee hotel information	https://www.theirvingtonwoods.org/wp-content/uploads/Identification_of_Common_Cavity-Nesting_Bees_CJ_Reilly.pdf
Integrated into production methods	
Garden IPPM	https://xerces.org/blog/how-to-control-garden-pests-while-supporting-pollinators
Prairie strips	https://www.nrem.iastate.edu/research/STRIPS/
Case studies for prairie strips, including budget information	https://tallgrassprairiecenter.org/prairie-farms/case-studies
Cover cropping for pollinators	https://www.xerces.org/publications/guidelines/cover-cropping-for-pollinators-and-beneficial-insects
Minimizing harm to pollinators from organic farming practices	https://xerces.org/publications/fact-sheets/organic-farming-practices
Optimizing insecticide use	https://xerces.org/publications/guidelines/organic-pesticides
Ecosystem-level enhancements	
Hedgerows	
Hedgerows for pollinator support (starts on pg. 8)	https://www.fs.usda.gov/nac/assets/documents/insideagroforestry/vol20issue1.pdf
Hedgerow cost estimates	https://www.xerces.org/publications/fact-sheets/estimated-costs-to-establish-pollinator-hedgerows
Hedgerow technical guide – for NJ, but relevant for KY	https://www.xerces.org/publications/habitat-installation-guides/new-jersey-hedgerow-planting-422-for-pollinators
Hedgerow case study – Vilicus Farm	http://www.vilicusinstitute.org/docs/Case-Study-Pollinator-Planting.pdf
Native plant meadows	
Selecting a seed mix	https://tallgrassprairiecenter.org/sites/default/files/inline-uploads/native_seed_mixes.pdf
Site prep for native plantings	https://www.xerces.org/publications/guidelines/organic-site-preparation-for-wildflower-establishment
Establishing pollinator meadows from seed	https://www.xerces.org/publications/guidelines/establishing-pollinator-meadows-from-seed
Establishing pollinator meadows with transplants	https://www.xerces.org/publications/fact-sheets/creating-perennial-pollinator-and-beneficial-insect-habitat-using-plugs
Long-term monitoring and maintenance	https://xerces.org/publications/guidelines/maintaining-diverse-stands-of-wildflowers-planted-pollinators

Budget information	https://www.xerces.org/sites/default/files/2018-05/16-032_01_XercesSoc_Estimated-Cost_Wildflower-Plantings-Using-Solarization_web.pdf
Manage existing habitat	
Field guide to KY invasive plants	https://forestry.ca.uky.edu/articles/for177-field-guide-kentuckys-invasive-plants
KY Division of Forestry technical assistance for management	https://eec.ky.gov/Natural-Resources/Forestry/Pages/default.aspx
Planting a riparian buffer, KY Extension	https://publications.ca.uky.edu/files/id185.pdf
Basic info on riparian restoration	https://www.sustainablefarms.org.au/on-the-farm/riparian-restoration/
Kentucky FWS riparian restoration, including funding resources	https://fw.ky.gov/Fish/Pages/Stream-and-Wetland-Restoration-Program.aspx
Oak savanna restoration	https://fw.ky.gov/Wildlife/Documents/SavannaWoodlandManagement.pdf
Guide to mid-South grasslands	https://www.segrasslands.org/guide-to-the-grasslands-of-the-midsouth
Interseeding grasslands with native plants	https://xerces.org/publications/guidelines/interseeding-wildflowers-to-diversify-grasslands-for-pollinators
Native plants	
Why native plants?	https://wildrootsnj.com/blog/why-choose-native-plants-a-wild-roots-manifesto
Establishing native plants from transplants	https://www.xerces.org/publications/fact-sheets/creating-perennial-pollinator-and-beneficial-insect-habitat-using-plugs
Establishing native plants from seed	https://www.xerces.org/publications/guidelines/establishing-pollinator-meadows-from-seed
Collecting and using seed	https://www.xerces.org/publications/guidelines/collecting-and-using-your-own-wildflower-seed
Find native plant species by zip code	https://nativeplantfinder.nwf.org/
Native plants database – very informative	https://www.wildflower.org/plants/
Help identifying native plants and insects	Seek or iNaturalist smartphone apps
Miscellaneous	
Pollination management for organic seed production	https://www.xerces.org/publications/guidelines/pollinator-management-for-organic-seed-producers
Grazing livestock on native grasses	https://fw.ky.gov/Wildlife/Pages/bluestem.aspx
Vineyard cover cropping	https://lodigrowers.com/cover-cropping-systems-for-organically-farmed-vineyards/
Wild Farm Alliance series on sustainable whole-farm pest mgmt	https://www.wildfarmalliance.org/whole-farm-spm-course?utm_campaign=whole_farm_spm_lesson1&utm_medium=email&utm_source=wildfarmalliance
KY FWS technical support, education, & funding for improving habitat	https://fw.ky.gov/Wildlife/Pages/Landowner-Services.aspx
Farm habitat assessment	https://xerces.org/publications/habitat-assessment-guides/pollinator-habitat-farms-and-agricultural-landscapes
Gardens, yards habitat assessment	https://xerces.org/publications/habitat-assessment-guides/habitat-assessment-guide-for-pollinators-in-yards-gardens
Grazing cover crops	https://pastureproject.org/publications/grazing-cover-crops-how-to-guide/

Resources for native seeds and transplants

Note: many commercially available "wildflower mixes" are not region-specific or contain a large proportion of non-native seeds! If using these, cross-check the contents with a native plant database to see if the species are suitable. Local native seed producers, conservation agents, etc. will have the expertise to help you choose plants adapted to your region and suited for your unique site conditions.

Company name	Location	What they sell	Website
UK Horticulture Club	Lexington, KY	Wide variety of Central KY-native grasses and herbaceous plants, some trees and shrubs, affordable prices. Students and advisor Shari Dutton are knowledgeable and eager to help.	Check Instagram (@ukhorticultureclub) or Facebook page (UK Horticulture Club) for semi-annual sale dates
Garden departments at hardware or grocery stores	Near you!	Hard to find but if you know what you're looking for, you can find some native perennials at discounted prices. Avoid cultivars and neonicotinoid treated plants.	ex. Meijer, Lowe's, Home Depot, Walmart
Roundstone Seed Company	Hart County, KY	Native seed mixes designed for site and purpose	roundstoneseed.com
Dropseed Native Plant Nursery	Goshen, KY	Transplants for forbs, trees, shrubs, grasses, and native seeds	dropseednursery.com
Ironwood Native Plant Nursery	Waddy, KY	Transplants for forbs, trees, shrubs, grasses, etc.	ironweednursery.com
Sylvatica Forest Farm	Rockcastle County, KY	Native and non-native fruit & nut trees	sylvaticaforestfarm.com
Pheasants Forever Habitat Store	Online	Regional and state-specific seed mixes designed to meet NRCS standards	https://www.pfhabitatstore.com/
KDF John P. Rhody Tree Nursery	Marshall & Morgan County, KY	Native KY trees	https://secure.kentucky.gov/InventoryServices/Forestry/Seedlings

Resources for project funding

There are many more funding resources available, this is just a brief list. It's highly recommended to reach out to your local NRCS agent, extension agent, conservation district, or OAK for 1:1 assistance with finding and applying to funding!

Name	Areas they cover	Benefits	Conditions	Website
NRCS Conservation Reserve Program	All states including KY	Rental payment to take land out of production	10-15 year contract, land and enhancements must meet certain standards	https://www.nrcs.usda.gov/programs-initiatives/crp-conservation-reserve-program
NRCS Environmental Quality Improvement Program	All states including KY	Payments and cost-share for wide variety of eligible projects	Pretty individualized-work with NRCS conservation planner	https://www.nrcs.usda.gov/programs-initiatives/eqip-environmental-quality-incentives
NRCS Conservation Stewardship Program	All states including KY	Payment for wide variety of enhancements on existing habitat, technical support	5-year contract, must implement specific project to their technical standards	https://www.nrcs.usda.gov/programs-initiatives/csp-conservation-stewardship-program/csp-enhancements-bundles-and-supplemental
Pollinator Partnership Native Wildflower Seed Grant	Canada and USA	Free seed for pollinator meadows	Minimum of 10 acres, site must be already prepped	https://www.pollinator.org/native-seed-grants
Seed a Legacy Program	KY and 13 midwest states	Free custom seed mix and technical support	Must dedicate at least 2 acres and follow their establishment guidelines	https://www.beeandbutterflyfund.org/seed-a-legacy-program.html
NFWF Monarch Butterfly and Pollinators Conservation Fund	OH, IN, IL, MO, does not include KY	Covers cost of various habitat improvement methods	Minimum size of 500 acres	https://www.nfwf.org/programs/monarch-butterfly-and-pollinators-conservation-fund
Pollinator Partnership Project Wingspan	OH, IN, IL, IA, does not include KY	Technical support, volunteer labor, free native plugs and seeds	Allow the organization to collect seed from your site and commit to manage for 5 years	https://www.pollinator.org/wingspan