

GOVERNOR'S COMMITTEE ON POLLINATOR PROTECTION

Recommendations for Voting

As of 8/30/2018

DESIRED OVERALL RESULT: HEALTHY, DIVERSE POLLINATOR POPULATIONS THAT SUSTAIN AND ENHANCE MINNESOTA'S ENVIRONMENT, ECONOMY, AND QUALITY OF LIFE.

Rationale: Healthy, diverse pollinators require good, clean food. This means that all Minnesotans should increase flowering habitats that provide good nutritional resources for pollinators, and take concrete steps to protect these habitats from undue pesticide exposure. These recommendations provide a variety of means to increase and maintain uncontaminated pollinator habitat across rural and urban areas of Minnesota, while enhancing Minnesota's economy and quality of life. Focusing solely on habitat, or solely on pesticide exposure, will not be sufficient to sustain and enhance pollinator populations.

GOAL 1: LANDS THROUGHOUT MINNESOTA SUPPORT HEALTHY, DIVERSE, AND ABUNDANT POLLINATOR POPULATIONS

Rationale: Prairie used to encompass over 1/3 of the state of Minnesota; today less than 2% remains, according to the Minnesota Department of Natural Resources Prairie Conservation Plan. The diversity, abundance, and health of pollinators requires access to sufficient and diverse flowers that bloom throughout the growing season, as well as undisturbed and uncontaminated habitat for foraging, nesting, and overwintering.

A. Maintain, restore, and enhance pollinator habitat on permanently protected natural lands

1) Expedite the update of the Minnesota Department of Natural Resources (MNDNR) wildlife food plot policy with a focus on pollinator habitat to address pollinator concerns

Rationale: There are currently about 15,000 acres of wildlife food plots managed by the DNR in Minnesota, mostly planted to monoculture corn and soybeans. Neonicotinoid insecticide seed treatments are prohibited in these plots, but are likely still commonplace because coordination, follow-up, and enforcement efforts present a challenge. There is a need for better education for cooperative farmers about the management requirements and where to purchase untreated seed, and/or the need to shift away from crops that are typically treated with neonicotinoid insecticides and instead plant species that can benefit a broader spectrum of wildlife. If designed and managed to promote a diversity of plants that benefit pollinators, these plots have the potential to provide valuable, pesticide-free habitat for pollinators and other wildlife including foraging, nesting, breeding, and overwintering habitat. We see these food plots as a relatively easy opportunity to benefit pollinators and other wildlife on public lands by diversifying the crops grown, including crops/cover crops that flower, and ensuring that the plantings are protected from pollinator-toxic pesticides. These plots also offer an opportunity for farmers/researchers to trial new cover crop blends, alternative crops, etc. on public lands.

Responsible entity: Minnesota Department of Natural Resources. Once policy changes are in place, technical assistance through local Soil and Water Conservation Districts (SWCDs) and other local groups with relevant expertise may help move this recommendation forward.

Implementation: The MNDNR is three years into the process of developing a new policy on food plots, including phasing out of monocultures and a new emphasis on multispecies covers. Expediting this process, and ensuring that changes take into account pollinators' best interests, is within the power of the MNDNR. Policy updates should specifically address pollinator resource concerns (forage, nesting, and protection from pesticides).

Funding: There is no cost for the DNR to expedite their policy update. Changes to cropping systems on these plots may come with implementation costs; e.g., there may be funding needs for seed if plots do not pay for themselves.

Timeline: To be completed within 1 year of the publication of this report.

Evaluation: Success evaluated in terms of acreage planted to species that provides valuable nesting and foraging resources for bees.

Challenges: Farmers may need technical assistance for planting new species; some farmers may be resistant to changing crop species; others may see this as an opportunity to trial new approaches/seed mixes on public land.

B. Maintain, restore, and enhance pollinator habitat on urban and developed lands

1. Establish a turf conversion and enhancement program focused on replacing or enhancing turf with flowering habitat in urban, suburban, and rural non-agricultural lands

Rationale: Urban habitat and rural-non-farm habitat have been identified as major gaps in pollinator habitat in Minnesota in terms of (1) land use categories not currently eligible for habitat conversion under most existing state and federal programs, and (2) numerous opportunities for partnership with a high level of interest/demand. Also, conversion of state-owned turf was identified as part of Goal 1 (habitat) in the 2017 MN State Agency Pollinator report. Turf-conversion is a relatively easy, rapid, and low-cost form of restoration, and would have immediate benefits to pollinators, as well as high visibility and potential for “ripple effects” through neighborhoods and communities. Urban habitats currently support the endangered rusty-patched bumble bee, but in very low numbers relative to previous decades. Existing populations of this species (and other bees) require abundant forage and nesting opportunities to rebound in numbers.

Responsible entities: Board of Water and Soil Resources (BWSR) and partners. Potential partners include other state agencies, UMN Extension, UMN Bee Lab, Xerces Society Urban Habitat Program, Local Non-Government Organizations (NGOs) already involved in urban habitat installations and/or education (Metro Blooms, Wild Ones, Pollinator Friendly Alliance, etc.), Neighborhood Associations, Homeowner Associations, and Schools/Corporate Campuses, and Municipalities that have passed pollinator friendly ordinances or are simply interested in pollinator friendly practices. MN Zoo could serve as a partner for outreach efforts.

Implementation: Create a Turf Conversion Pollinator Habitat Program to allocate funding for pollinator habitat projects on urban, rural, and other lands currently not eligible for existing state/federal programs. Focus on both education and funding for conversion of managed turf grass in MN to flowering habitat. This includes opportunities on public lands (parks/trails/WMA/schools/government buildings) and private lands (yards, golf courses, corporate campuses, private schools/colleges). This could also include plantings in rural areas without crop history or lands that are not currently eligible for existing programs. Habitat options include bee-lawns, native flowering habitat, native shrub plantings, rain gardens, and other pollinator-friendly options. Pesticide drift issues are to be addressed via education/outreach and in habitat placement decisions. Habitat mapping of existing and potential habitat could help identify priority spots for projects, based on habitat connectivity, at-

risk species distributions, and protection from pesticides. Installations could be tailored to support select species (e.g., monarchs, rusty patched bumble bees, honey bees) or be general.

Funding: There would be staffing costs to run the program (e.g., project management, turf conversion specialists; outreach) as well as implementation costs for habitat. Some entities (e.g. corporate campuses) will be able to bring implementation funding to the table, while others (e.g. public schools) won't. Could seek 2020 LCCMR funding with numerous partners; budget needs development, but \$300K every two years is a ballpark. Additional potential funders include Parks and Trails Legacy Fund Coalition and the Lessard-Sams Outdoor Legacy Fund.

Timeline: Planning meetings to refine program objectives and initiate funding mechanisms should occur within 1 year of the publication of this report.

Evaluation: Success to be evaluated in terms of acres planted to habitat. Outreach objectives could also be developed/quantified.

Challenges: Urban habitat may not offer as much acreage for habitat improvements as other landscapes, and also tends to be higher maintenance to meet aesthetic criteria. Weed-free turf is a cultural, and in some cases a mandated, norm and widespread acceptance may be difficult. Significant outreach and signage will be needed. Sod production and turf maintenance industries may be impacted.

2. Encourage and Incentivize new public education facilities (schools, colleges, and universities) and major remodeling projects include a certain percentage of pollinator landscaping and do the same for private education facilities

Rationale: To engage students and school neighborhoods and provide pollinator education and awareness of the need for pollinator habitat through demonstration and hands-on participation. Also to provide an on-site venue to utilize when teaching concepts related to insects, plants, and ecology.

Responsible entities: MN Departments of Education and Administration ISD's, University of Minnesota, and Minnesota State colleges and universities

Implementation: Could include a recognition program (would need funding or a sponsor.) Utilize agency resources to increase outreach/technical/maintenance assistance to educational facilities that wish to establish pollinator-friendly habitat

Funding: School district levies; public, non-profit, or corporate sponsorship.

Timeline: This would be a long-term initiative.

Evaluation: Percentage of schools that meet landscaping requirement, number of acres of pollinator habitat on school properties, number of students impacted.

Challenges: Pollinator plantings will require some maintenance initially, as well as committed care over the long term.

3. Increase funding for the Minnesota Board of Water and Soil Resources (BWSR) to assess and certify solar developments for pollinator-friendly habitat

Recommendation summary: Solar farms can be paired with pollinator habitat as long as a plan exists to increase BWSR's capacity to assess and certify sites. In order to increase BWSR's capacity, funding will be required.

Rationale: Solar farms are an important opportunity to leverage private-sector dollars to create thousands of new acres of high-quality pollinator habitat. Solar farms have the potential to provide valuable pollinator habitat in a variety of Minnesota habitats.

Responsible entities: BWSR, Minnesota Department of Commerce (Division of Energy Resources), Minnesota Department of Agriculture, Minnesota Department of Natural Resources.

Implementation: Issue a statement supporting solar development on sites with a high potential to provide exemplary pollinator habitat (score of 85 or greater on BWSR solar assessment) and an increase in the BWSR's capacity to assess and certify sites. Encourage all state agencies, state universities and colleges, and municipalities, to include pollinator-friendly vegetation in their RFP criteria when soliciting bids for solar energy procurement. Encourage and increase the BWSR's, as well as the Department of Agriculture and Department of Natural Resources, staff capacity to educate counties, townships, and soil and water conservation districts about the state standard for pollinator-friendly solar.

Funding: Increasing staff capacity will require funding. This could come from various sources such as a pollinator license plate initiative.

Timeline: The first step could be to partner with an energy nonprofit to produce a report calculating the total number of acres of pollinator habitat that could be created by state agencies, universities, colleges, and municipalities being powered by pollinator-friendly solar arrays. It would be great to do this at or before the University of Minnesota Pollinator Summit on Oct. 12, 2018. The next step would be on-going.

Evaluation: Percentage of solar installations that meet BWSR solar assessment and number of acres of pollinator habitat installed on solar sites.

Challenges: Knowledge of the program will be a barrier to implementation and cost and time to implement. Funding will be needed for maintenance to control weeds and grasses.

C. Maintain, restore, and enhance pollinator habitat on private lands

1. Promote existing pollinator habitat programs; expand funding and eligibility criteria for pollinator habitat and management practices on rural lands

Rationale: Given the number and scope of existing farm habitat programs (see BWSR and Xerces resources) we do not believe a new "native habitat on farms" program is needed, but we do recommend a certain amount of funding be made available to work with farmers or rural landowners who meet one or more of the following criteria

- Ineligible for existing state and federal programs (e.g., NRCS, FSA, BWSR).
- In range of at-risk pollinator species & interested in going above & beyond with seed mixes, management practices, etc.
- In need of funding for select practices (including habitat management actions) that benefit pollinators, but fall outside of the scope of current programs.

We also recommend cost-share assistance be provided to farmers seeking Bee Better Certification (a new, third-party verified certification program focused on integrating flower-rich habitat into farms).

Responsible entities: BWSR, MDA, Xerces Society, other interested partners, ideally working in coordination with USDA field staff to connect interested producers with state resources and technical support.

Implementation: An application process should be used to identify/prioritize partners. Once partners are selected, technical assistance would be provided and funding needs for plant materials (e.g., seed mix enhancements), certification, or other practices would be determined and allocated to the project. Cost-share funding for farmers to obtain Bee Better certification could be modeled after similar certification cost-shares provided by the state for Organic Certification, Good Agricultural Practices (GAP) certification, and other forms of certification.

Funding: Funding for implementation and staff time/ technical assistance are both needed. Private funding may be an option, in addition to (or instead of) state dollars.

Timeline: Timeline may be dependent on needs, as determined by new Farm Bill.

Evaluation: Evaluation of success could be in terms of improvements to seed mixes planted in MN. Number of farms certified as Bee Better would be another valuable metric. Monarch benefits would be a relatively easy metric to narrow in on (number of milkweed stems, high quality nectar plants, etc., since there are protocols in place for measuring this, and since there are specific goals set for our state).

Challenges: Pesticide drift in this landscape is a concern that would ideally be mitigated by thoughtful habitat placement or other strategies.

2. Increased Use of Flowering Cover Crops/Establish an MDA-directed Cover Crop Initiative incentivizing flowering cover crops

Rationale: The Minnesota Department of Agriculture (MDA) reports that 2% or less of Minnesota cropland acres have a cover crop based on data from the National Ag Statistic Survey (NASS). Most cover crops are planted on acres where potatoes, edible beans, peas, sweet corn, and corn silage are grown. Although the integration of cover crops into crop rotations can be challenging, such efforts are well-known to provide a wide range of landscape benefits to water, soil, and wildlife, including pollinators and beneficial insects for pest control. It is recommended that the MDA set goals for acres planted to cover crops in MN, and develop programs (outreach material, technical assistance, funding pools) to achieve these goals. To benefit pollinators, cover crop goals should focus on flowering cover crop species (e.g., red clover, alfalfa, buckwheat) integrated into cropping systems in which systemic insecticides have not been in use for at least one growing season. Benefits of non-native legumes to honey bees would be particularly significant, and could address a much needed resource concern for this group.

Responsible entities: Minnesota Department of Agriculture, working with crop consulting professionals and other local partners (e.g., LSP, SFA, NRCS, Conservation Districts). BWSR is also focusing increased attention on cover crops and would be interested in playing a role in promoting and implementing cover crops. Cover crops are currently being funded as an eligible activity through state cost-share funding, but these General Funds have been decreased over time.

Implementation: We recommend that the state fund an MDA-directed Cover Crop Initiative - a program to promote farmer participation, working with crop advisers or other local partners (e.g., LSP, SFA, NRCS, Conservation Districts), in cover crop trials on their operations. A blanket incentive payment would be provided to participants to help cover seed cost, time/maintenance/equipment involved, potential (although unlikely) yield loss, etc. The MDA currently has a similar, very successful initiative focused on nutrient management that this program could be modeled after. We recommend this initiative as a high priority for funding, given the overlap with our pollinator habitat objectives. We also recommend that this initiative have a certain amount of resources specifically earmarked for flowering covers (e.g., red clover, alfalfa, buckwheat, brassicas, cocktail blends) integrated into organic or other cropping systems in which pollinator-toxic pesticides are not in use to provide the most benefit to pollinators. As part of this work, the initiative will develop and showcase examples of cover cropping systems/rotations that work economically, and complete an Assessment of Needs (market development, infrastructure, crop insurance, research, transition year period incentives, etc.).

Funding: Clean Water Council funding is one option that has been proposed.

Timeline:

Evaluation: One simple pollinator metric would be acres of habitat planted per year to flowering cover crops allowed to bloom (i.e., acres providing foraging resources for honey bees and other insects).

Challenges: Considerable research has focused on cover crops and their integration into agricultural systems, but the idea has not been widely accepted. Better incentives are needed and would likely include a need for significant funding. Benefits of single species, non-native flowering cover crops to a wide array of native pollinators may be limited, so it should be clear that these plantings supplement but do not replace the need for native habitat on farms. That said, the honey bee benefits provided by this type of habitat could be quite high, relative to native habitat. It would be important to avoid impacts from neonicotinoids where flowering cover crops would be used, as they can persist in the soil and be taken into the flowering plants. Finding enough opportunities to plant flowering covers systems without recent neonicotinoid use may be challenging, and may also require an education/outreach component. Benefits to pollinators need to be balanced with the other benefits offered by cover crops and the logistics of establishment (e.g., in some situations, termination may need to happen before bloom, to achieve other goals).

3. Increase flowering pasture

Rationale: Livestock grazing offers an opportunity to increase pollinator food and nesting resources on “working lands” actively used for agricultural production. By controlling the number of cattle, timing, frequency, and duration of grazing, land managers can support wildflowers and pollinators while still meeting the nutritional demands of their livestock.

Additional benefits of pasture include reduced tillage, reduced pesticide use, increased habitat for grassland birds, etc. In order to promote additional pasture in Minnesota, it is recommended that policy makers and the MDA set goals for acres planted to pasture in MN, and develop programs (outreach material, technical assistance, financial incentives) to achieve these goals.

Responsible entities:

- Minnesota Department of Agriculture - Identify incentives to increase pasture in areas that are currently row crop agriculture. In collaboration with the MN DNR, set a target acreage to convert existing row crop agriculture to pasture.
- Minnesota Department of Natural Resources - Using the MN Prairie Conservation Plan as a framework, work with MDA to identify areas where incentives can be used to encourage private landowners to convert existing row crop agriculture to pasture. Especially in areas next to remnant prairie containing at risk pollinators which are susceptible to pesticide drift. Implement a working lands approach as identified in the MN Pheasant Summit Action Plan.
- Minnesota Board of Water and Soil Resources - continue/expand Working Lands Program
- University of Minnesota - Support research on range ecology, with an emphasis on using grazing as a tool to increase flowering resources for pollinators.
- Minnesota Department of Revenue - work with MDA to identify tax break incentive solutions
- Land Stewardship Project (LSP), Sustainable Farming Association (SFA), and MN Cattleman's Association should be partners on these efforts.

Implementation: State agencies and legislators will develop incentives to implement. Incentives may be region specific, focusing on increasing pasture around high quality habitats, or at risk species which need protection from pesticide drift (i.e., such as areas identified in the MN Prairie Plan, and BWSR Pollinator Habitat mapping efforts).

Funding: Use of general fund to dedicate agency staff resources towards implementation. Supplemental funds through the Clean Water Land and Legacy Amendment (Outdoor Heritage or Clean Water Fund) or LCCMR.

Timeline: Depends on funding, state and federal partnerships.

Evaluation: Set region specific goals based on acres.

Challenges: Federal policies related to crop insurance and subsidies may be difficult for state policy to overcome. Care must be taken to use livestock stocking rates that provide enough flowering resources for pollinators.

4. Develop an integrated, comprehensive, strategy for the enhancement, creation, and maintenance of high-quality pollinator habitat along surface-water-corridors primarily in rural areas

Rationale: This initiative would provide multiple environmental and socioeconomic benefits in addition to of high-quality pollinator habitat, including enhanced wildlife habitat and protected and improved water quality. Farmstead and other rural lands are the primary focus of this

recommended initiative because they occupy the largest footprint in Minnesota (approximately 26 million acres; 54% of the Minnesota landscape) and have had the biggest impact on pollinator habitat across the state. As a result, these lands offer the greatest potential for substantively re-establishing quality and connected pollinator habitat on a landscape scale in the State of Minnesota. Surface-water corridors include rivers, streams, lakes, and wetlands, in combination with suitable road, utility, and rail corridors and other public (DNR lands, parks, natural areas, etc.) and private lands in rural areas.

A strategic program with a rural-habitat-corridor focus builds on an existing base of publicly-owned and other protected lands and fits within the framework of a variety of existing federal, state, and local priorities including USDA programs like the Wetland Reserve Program (WRP), Environmental Quality Incentives Program (EQIP), Agricultural Conservation Easement Program (ACEP), Conservation Reserve Program (CRP), and the Conservation Stewardship Program (CSP), the NRCS Monarch Butterfly Habitat Development Project and Mid-America Monarch Conservation Strategy (an increased habitat and milkweed stem initiative with a goal of 1.3 to >1.8 billion additional milkweed stems), Governor Dayton's clean water initiative, and Minnesota Department of Natural Resources, Board of Water and Soil Resources, local government, and private land conservation programs (The Nature Conservancy, Ducks Unlimited, Pheasants Forever, Trout Unlimited, etc.).

Responsible entities: The Minnesota Departments of Natural Resources (MNDNR), Agriculture (MDA), and Transportation (MnDOT), and the Minnesota Board of Water and Soil Resources (BWSR; along with soil and water conservation districts and watershed districts and other water management organizations) would likely be the lead agencies in the implementation of this recommendation, but the MN Pollution Control Agency and the MN Department of Health, as well as other state agencies, may also have a role.

Implementation: The pollinator habitat created along surface-water-corridors should be appropriately diverse, connected, functional, safe, etc and in all the necessary forms (i.e., prairie, forest, savanna, and wetlands with the required habitat components – native plant diversity and enhanced floristic diversity with a special focus on pollinator-specific species, bare soil, woody debris, snags, etc.). Once a network of primary habitat corridors has been identified, the habitat corridors should be expanded to include additional adjacent lands permanently acquired and placed in the public's trust, including private lands on a voluntary basis through donations, donated and purchased conservation easements, and fee-for-title purchases in combination with existing and future federal, state, and private conservation programs and efforts and incentivized and enhanced on-farm initiatives (cover/companion crops, windbreaks/hedgerows, crop diversification, etc.).

Funding: Potential funding mechanisms might include prioritized Clean Water, Land, and Legacy Amendment funds, given the constitutional purpose of these funds – “to protect drinking water sources; to protect, enhance, and restore prairies, forests, and fish, game, and wildlife habitat; to preserve arts and cultural heritage; to support parks and trails; and to protect, enhance, and restore lakes, rivers, streams, and groundwater,” specific projects approved by the Minnesota State Legislature, state agency funding, conservation easements, property tax credits, and other sources.

Timeline: Ongoing, but a comprehensive framework should be developed within three years.

Evaluation: Documentation of the number of acres of quality pollinator habitat created/restored on an annual basis with 5-year, 10-year, and longer-term and ultimate targets.

Challenges: A long-term program with long-term funding needs and a significant funding commitment.

D. Increase pollinator habitat on right-of-way land

1. Encourage policies and practices that increase pollinator habitat on roadsides

Rationale: Roadside vegetation is important to ensure safe passage for vehicles, draining stormwater, and soil stabilization. Roadside vegetation also provides habitat for pollinators, and is especially important in areas where nectar and pollen resources are limited on the landscape.

Roadside vegetation stewardship statutes, policies and practices should be developed to provide a safe roadway corridor for motor vehicles, while maintaining and increasing pollinator habitat.

As part of a MN DOT Mowing & Haying Stakeholder Committee, a concept called take half leave half developed that would provide safe roadways, habitat for wildlife and pollinators, and hay for adjacent landowners. Under the concept, an adjacent landowner could hay the first 16' at any time throughout out the season, while only haying the remaining areas once from July 1 through August 15th to provide regrowth of Milkweed and other nectar and pollen resources for pollinators. This type of system would maximize pollinator habitat, and encourage roadside vegetation stewardship that would help keep quality habitat on the landscape.

Responsible entities: Minnesota Department of Transportation, Minnesota Department of Natural Resources, Minnesota Department of Agriculture

Implementation:

Adjust state statute to allow for an earlier cut date (July 1 through August 15th).

Adjust state statute to allow for earlier cut in first 16' of roadway.

Funding: No funding needed.

Timeline:

Evaluation: Voluntary adoption by farmers

Challenges: Attitudes on private use of public land. Use of public funds to mow what a private landowner would. Lack of plant knowledge from farmers, and roadside operators. Haying can reduce pollinator habitat if timed poorly, or if conducted too frequently.

E. Recognize the value of flowering non-native species

1. Recognize the value of flowering non-native species

Rationale: Diverse native plant communities are critical in providing habitat for a large array of native bees, butterflies, and other pollinators, and should be prioritized whenever possible. However, there also is a need to increase floral resources for honey bee colonies, whose honey production in MN depends predominantly on clover, basswood trees (*Tilia*), alfalfa and other

“wildflowers” (native and non-native species). As average honey production in the state of MN has decreased by half over the last 30 years due to changes in land use, we recommend the following:

- The use of non-invasive, non-native species in hay fields, pastures, energy installations, ROW, Utility, or Parks should be considered if conditions do not allow for successful establishment of native species.
- Recognize the value associated with non-invasive, non-native species in recommended seed mixes, such as *Trifolium* spp. clovers, and alfalfa, which may provide the only nectar resources for pollinators in an area devoid of native plant species.

Responsible entities: Minnesota Department of Agriculture, Minnesota Department of Natural Resources, Land Stewards

Implementation: Recognition of ecosystem services

Funding: None

Timeline:

Evaluation:

Challenges: Attitudes on plant impact, institutional, lack of plant knowledge. Concern: Economic impact

GOAL 2: MINNESOTANS USE PESTICIDES JUDICIOUSLY AND ONLY WHEN NECESSARY, IN ORDER TO REDUCE THE HARM TO POLLINATORS FROM PESTICIDES WHILE RETAINING ECONOMIC STRENGTH

Rationale: While Minnesotans increase flowering habitats that provide good nutritional resources for pollinators, we must protect these habitats from undue pesticide exposure in both urban and rural areas. Insecticide application onto or into flowers and plants that pollinators use for food or nesting materials can harm pollinators (via acute lethal toxicity) or over time (via sublethal effects on behavior and physiology). Herbicide exposure can kill off the flowering habitat directly. Some fungicides synergize the toxic effects of insecticides, or disrupt pollinators’ natural microbiota, leading to their increased susceptibility to pathogens and parasites).

The grand challenge moving forward is figuring out how to protect pollinator habitat from pesticide exposures while protecting crops, gardens, and human occupied areas from undue pest and pathogen exposure: How do we encourage beneficial pollinators while discouraging harmful pests?

A. Reducing risk of pesticide exposure to pollinators through education on pollinator best practices

Rationale: These three recommendations strive to increase awareness and education to ensure all Minnesotans use insecticides, herbicides, fungicides properly, and within an Integrated Pest Management (IPM) framework, as defined on last page. Recognizing that pesticide exposure is a

serious problem facing pollinators, education forms the basis to protect them in our current and into future generations.

1. Increase education on Integrated Pest Management practices and proper pesticide application

Recommendation summary: Items 1 and 2 in this section will work in tandem to increase adoption of IPM practices, which will reduce overall pesticide use and decrease risk to pollinators.

Rationale: Implementation of integrated pest management will reduce overall pesticide use, thereby reducing risk of exposure to pollinators.

Responsible entities: MN Department of Agriculture and University of MN Extension

Implementation: This educational campaign would be a coordinated effort among key “information sources” to deliver consistent IPM messaging (including: scouting, thresholds, alternate tactics) and proper pesticide application to stakeholders. These stakeholders include farmers, beekeepers, businesses (commercial landscaping, golf courses, etc.), state and county roadside managers, (others??), and homeowners, in rural and urban areas. For agriculture sector, for example, these “information sources” could comprise grower associations, state agencies, extension and industry providing consistent messaging to the state’s growers and agricultural professionals. Information dissemination through this recommendation would leverage the stakeholder networks and education/ communication/media infrastructure of the participating “information sources.” The novelty of this suggestion is in bringing the various information sources together to identify gaps in IPM training materials and funding requirements. Furthermore, having these information sources disseminate unified messaging on IPM would be precedent setting.

IPM definitions: <https://ipmworld.umn.edu/ipm> and <https://www.epa.gov/safepestcontrol/integrated-pest-management-ipm-principles>

Funding: Funding requirements are to be estimated by the responsible entities. The MN Dept. of Agric. will identify mechanism for funding.

Timeline: These efforts would continue as part of certification and training programs and at professional development programs hosted by sector organizations including, commodity groups, beekeeper associations, turf grass and golf course management organizations, master gardener program, extension education and outreach. These education materials will be updated as new materials are developed and ready for distribution.

Evaluation: Adoption of IPM practices by some stakeholders can be assessed through surveys performed at targeted educational events, such as pesticide applicator training, or through electronic surveys sent to association membership lists.

Challenges: Assessment of adoption of IPM practices by some stakeholders (e.g., general public) will be difficult.

2. Promote incentives for increasing adoption of IPM strategies

Rationale: Implementation of integrated pest management will reduce overall pesticide, thereby reducing risk of exposure to pollinators.

Responsible entities: Minnesota Department of Agriculture and relevant agencies.

Implementation: Identify programs currently available that would incentivize adoption of IPM strategies. Where gaps exist, MDA (or other agency) would consider development of an incentive program to increase adoption of practices not covered by existing programs. Example of IPM strategies that could be considered is use of pest-resistant crops and crop rotations and cropping systems. This effort is precedent setting as it would facilitate/increase adoption of a diversity of management tactics and other IPM practices. This effort would complement the educational programs (A1) and further increase the rate of adoption while removing any perceived risk associated with a given change in management strategies.

IPM definitions: <https://ipmworld.umn.edu/ipm> and <https://www.epa.gov/safepestcontrol/integrated-pest-management-ipm-principles>

Funding: MDA and relevant agencies will identify mechanism for funding.

Timeline: MDA and relevant agencies will determine a timeline for implementation of this item.

Evaluation: Adoption of IPM practices by some stakeholders can be assessed through surveys performed at targeted educational events, such as pesticide applicator training, or through electronic surveys sent to association membership lists.

Challenges: Identification of funding sources/mechanisms may pose a challenge.

B. Reducing risk to pollinators by controlling drift and off-target movement of pesticides leading to undue exposure

Rationale: These recommendations strive to reduce or eliminate drift and off-target movement of insecticides, fungicides and herbicides, through education and training, voluntary incentives, and/or MDA funding for enforcement of label. The expectation is that reducing above and below-ground movement of pesticides to flowering plants would reduce pollinator exposure and protect pollinator habitat.

1. Increase Minnesota Department of Agriculture (MDA) enforcement of pesticide labels for pollinator protection

Recommendation summary: The MDA shall ensure that pesticide labels are enforced in a manner that ensures intended pollinator protection ([described by EPA Label Review Manual Chapter 8](#)) with a focus on changing future behavior if a pesticide applicator violates the label.

Rationale: Protections have been in place to mitigate pesticide exposure to pollinators since USDA regulations of the 1960's prior to the formation of US EPA. The cornerstone has always been the clear and unambiguous admonition: "Do not apply to blooming crops or weeds," which appears on the label. Pollinator exposure to pesticides can be avoided if the label is followed. Extended residual toxicity (greater than 8 hours) cannot be legally applied or drifted onto blooming crops or weeds. Short residual toxicity products (less than 8 hours) can be legally applied to bloom early morning, late evening, or when temperatures are below 55F.

MDA is not currently citing or fining violators for illegal applications to bloom. This complete lack of enforcement encourages pollinator dangerous behavior in the same way that speeding would be encouraged if no speeding tickets were ever written.

The American Beekeeping Federation ABF the largest National organization of beekeepers “Urge(s) EPA to change the bee-hazard warning on pesticide product labels to eliminate “exemptions” which allow their use on blooming plants and push USDA and EPA to convene a Pesticide (crop protection) Summit to illuminate these issues and facilitate solutions.”

Additionally, The US EPA is currently in the process of weakening this long standing safeguard. If the federal EPA moves to weaken labels, our committee recommends that Minnesota maintain long standing label protections that were in effect on January 1, 2017. Minnesota should, through statute or administrative rule, establish its own label protections. Under the Minnesota Department of Agriculture’s charter with EPA, the MDA can be more stringent in regulating pesticides than the Federal, but not less stringent. This is one area where Minnesota can and must lead the way for the nation.

Responsible entity: MDA is currently the sole authority governing pesticide registration and oversight in the State of Minnesota through a “primacy agreement with US EPA.

Implementation: The MDA shall ensure that pesticide labels are enforced in a manner that ensures intended pollinator protection with a focus on changing future behavior if a pesticide applicator violates the label. Enforcement should include special attention to violations that occur when pesticides are applied while crops are in bloom and pollinators are foraging (in violation of bee hazard label). This may include: increased random enforcement checks during specific periods, as defined by the MDA and stakeholders; increased random enforcement checks in specific places, as defined by the MDA and stakeholders. Fines should be levied when there are label violations, with the intent of changing future behavior.

This committee recommends the MDA should immediately publish a comprehensive list of products of short residual toxicity and extended toxicity. This list should clearly state the law, that only short residual toxicity products can be legally applied to blooming crops or weeds.

Funding: The Legislature should provide adequate funding to the MDA to allow for their ability to enforce federal law.

Timeline: Immediately.

Evaluation: MDA is responsible for setting a management and evaluation schedule.

Challenges: The label has been the law, but a law that hasn’t been enforced. Increasing enforcement can be challenging.

2. Provide the Minnesota Department of Agriculture (MDA) with the resources and tools to assure that EPA label requirements intended to protect pollinators are followed in Minnesota

Rationale: US EPA has delegated sole oversight authority in Minnesota to the MDA. MDA must have sufficient resources to ensure labels are being protective as envisioned in the registration process to ensure safe use practices are adhered to.

The MDA, in its own pollinator protection recommendations, proposed creation of a Pollinator Protection Account. The recommendation suggests that additional resources are needed by MDA to implement its own recommendations.

At present many persons, including commercial beekeepers as well as pollinator protection advocates, are calling for increased MDA activities in EPA label enforcement, as evidence by

recommendation A1 Current enforcement efforts are restrained by budget limitations, additional resources will be needed if greater enforcement is to take place.

Many recommendations of the Governors Pollinator Protection Committee call for additional work by the MDA. Since all MDA resources are now allocated to important work which must continue, additional resources must be made available to MDA through the legislative appropriations process.

Responsible entity: MN Legislature

Implementation: The MDA should be charged with making pollinator protection EPA label compliance an agency priority. MDA should define resources and tools needed and be fully funded to do what they need to do.

Funding: Legislative appropriation

Timeline: 2019 Legislative Session.

Evaluation: Evaluation is not appropriate for this recommendation

Challenges: Securing appropriate funding is a legislative barrier.

3. Reduce/eliminate off-target movement of pesticides through applicator training, BMPs, demonstration, and continued research

Recommendation summary: Suggestions 3 and 4 in this section will work in tandem through education and incentives to increase adoption of technologies and practices to reduce off-target movement of pesticides, which will decrease exposure of pollinators to pesticides.

Rationale: Reduction of off target movement will reduce pesticide load in flowering non-crop habitats, thereby reducing risk of pollinator exposure to pesticides.

Responsible entities: MDA and U of MN Extension.

Implementation: This educational campaign would be a coordinated effort among key “information sources” to deliver consistent messaging on the reduction of drift/off target movement through stakeholder networks. MDA and University of MN Extension would include drift reduction strategies as part of pesticide applicator training, pollinator best management practices, field demonstration and research. These stakeholders include farmers, businesses (commercial landscaping, golf courses, etc.), state and county roadside managers, and homeowners in rural and urban areas. For agriculture sector, for example, these “information sources” could comprise MDA, Equipment Manufacturers, ASTA, CropLife America, Grower Groups, Seed Dealers and Extension providing consistent messaging to the state’s growers and agricultural professionals. Drift reduction recommendations will include the latest research-based information on practical steps to reduce off-target movement and will provide consistent educational messaging for stakeholders. As part of this approach, entities such as BWSR and DNR could make localized maps of sensitive sites (e.g., remnant prairie with threatened skipper populations) available to landowners, applicators and agricultural producers. Information dissemination through this recommendation would leverage the stakeholder networks and education/ communication/media infrastructure of the participating “information sources.”

The novelty of this suggestion is in bringing the various information sources together to identify gaps in drift reduction training materials and funding requirements. Furthermore, having these information sources disseminate unified messaging on drift reduction would be precedent setting.

Funding: Funding requirements are to be estimated by the responsible entities. The MN Department of Agriculture will identify mechanism for funding.

Timeline: MDA and relevant agencies will determine a timeline for implementation of this item.

Evaluation: Adoption of drift reduction practices and technologies can be assessed through surveys performed at targeted educational events, such as pesticide applicator training, or through electronic surveys sent to association membership lists.

Challenges: Assessment of adoption of drift reduction technologies and practices by some stakeholders (e.g., general public) will be difficult.

4. Promote incentives to increase adoption of drift-reduction technologies

Recommendation summary: Suggestions 3 and 4 in this section will work in tandem through education and incentives to increase adoption of drift reduction technologies and practices, which will decrease exposure of pollinators to pesticides.

Rationale: Reduction of pesticide drift will reduce pesticide load in flowering non-crop habitats, thereby reducing risk of pollinator exposure to pesticides.

Responsible entity: MDA

Implementation: MDA should convene a stakeholder working group of Equipment Manufacturers, ASTA, CropLife America, Grower Groups, Seed Dealers to identify drift-reduction technologies (e.g., fluency agents and planter technologies) where incentives would benefit and drive adoption. As an example, the incentives could cover the difference between a standard seed lubricant and a new alternative lubricant with proven dust-reduction characteristics. Incentives of this kind would be a new approach to reduce drift and adoption would be measurable. This is precedent setting as it could include practices and strategies that go beyond label requirements.

Funding: MDA and relevant agencies will identify mechanism for funding.

Timeline: MDA and relevant agencies will determine a timeline for implementation of this item.

Evaluation: Adoption of drift reduction technologies can be assessed through surveys performed at targeted educational events, such as pesticide applicator training, or through electronic surveys sent to association membership lists.

Challenges: Identification of funding sources/mechanisms may pose a challenge.

C. Reduce pesticide use overall (insecticides, herbicides, fungicides)

Rationale: These recommendations strive to reduce use of pollinator harming pesticides in general (including insecticides, herbicides and fungicides) through establishing an indemnity fund for farmers who experience crop loss as a result of not using pollinator harming pesticides; setting a

goal to reduce use of pollinator harming insecticides in MN within 3 years; and supporting efforts to prevent the spread of invasive species.

1. Establish a Minnesota Department of Agriculture (MDA) Crop Pest Loss Indemnity Fund for farmers avoiding pollinator-harming pesticides

Recommendation summary: The MDA will manage a Crop Pest Loss Indemnity Fund, that will reimburse voluntarily participating farmers for partial crop losses on enrolled acres (for losses below the level covered by traditional Multi-Peril Crop Insurance), which could have been prevented by the use of pesticides when the farmer chooses not to use pollinator harming pesticides

Rationale: Farmers are confronted with many perils, including drought, hail, and pests. Farmers take careful precautions to reduce these risks as much as possible. Much pesticide use is prophylactic in nature to ensure damage can not occur—even if the chance of pest-related damage is very low. Treating pest damage like hail or drought, and insuring against actual damage would eliminate prophylactic chemical use greatly. This model is based on other crop indemnity programs, like Italy's, that support farmers in reducing unnecessary inputs while mitigating risk.

Responsible entities: 2019 Legislature, MDA

Implementation: The Legislature should create a Crop Pest Loss Indemnity Fund, managed by the MDA, that will reimburse voluntarily participating farmers for partial crop losses on enrolled acres (for losses below the level covered by traditional Multi-Peril Crop Insurance), which could have been prevented by the use of pesticides when the farmer chooses not to use pollinator harming pesticides. This program should be created on a trial basis with claim payments made available for four crop years. This program will be claim based. The agency responsible for implementing this recommendation will need to create a set of claim criteria and a claim process, probably one that mirrors Multi-Peril Crop Insurance. This agency must be provided with additional resources to fulfil this work and to pay claims. This would be similar to losses paid for wolf depredation of livestock. The farmer would need to prove or document that they did not use the prohibited chemicals and that the losses result from pests that would have been controlled by using a commercially available pesticide. Acres impacted depends on budget of the program, also on voluntary program registration.

The Department of Agriculture is authorized to make rules to implement provisions of the legislation.

Funding: This program shall be available at no cost to participating farmers. Funding for claims and program administration should come from the Pesticide Regulatory Account or a newly created Pollinator Protection Account.

Timeline: 2019 Legislature, 2020 crop year.

Evaluation: MDA is responsible for setting a management and evaluation schedule to track participating farmers. This program will be established on a trial basis lasting one four-year cycle of claim payments.

Challenges: Securing appropriate funding is a legislative barrier to implementing any program. Because there is no domestic precedent for a Crop Pest Loss Indemnity Fund, clear planning and management by MDA will be crucial to its success.

2. Adopt in statute a goal to reduce overall use of pesticides harmful to pollinators and designate an agency to create and implement a plan to meet the target

Recommendation summary: MN Legislature should adopt in statute a goal to reduce the overall use, both public and private, of pesticides harmful to pollinators within 3 years of state adoption of the goal. The goal of this proposal is to decrease overall pesticide use, with no increase in use of products that are toxic to pollinators or to human health, and favoring the use of short residual pesticides (less than 8 hours) over those with extended residual properties.

Rationale: Decreasing use of products that are harmful to pollinators by a measurable quantity will mean that fewer pollinators come into contact with these chemicals. Because many agencies are involved in the management and tracking of state pesticide use, it is difficult to establish common goals for regulatory action. This recommendation outlines a set of steps for inter-agency cooperation.

Responsible entities: 2019 Legislature, implemented by all state agencies.

Implementation: MN Legislature should adopt in statute a goal to reduce the overall use, both public and private, of pesticides harmful to pollinators within 3 years of state adoption of the goal. The goal of this proposal is to decrease overall pesticide use, with no increase in use of products that are toxic to pollinators or to human health, and favoring the use of short residual pesticides (less than 8 hours) over those with extended residual properties. A “reduction” means both a decrease in total volume of pesticides used including seed treatments, *and* no increase in toxicity of products used. For example, using a lesser volume of a more toxic product does not constitute a successful reduction in pesticide use.

The legislation should designate a lead state agency to accomplish this goal and include a charge to every state agency involved in pesticide monitoring and or regulation be directed in statute to prepare an Agency Plan of Action to be submitted to the legislature prior to the next legislative session that includes at least the following:

- Steps the agency intends to take to reduce the use of pollinator-harming pesticides through regulation, educational outreach, improved reporting requirements, and other steps determined by the agency;
- New or expanded statutory agency authority needed to implement its Agency Plan of Action;
- Plans for reduction of pollinator-harming pesticide use by the agency itself;
- Additional resources needed by the agency to fully implement its Agency Plan of Action, including identification of any necessary research on alternatives to pesticides currently in use;
- UMN shall be charged with identifying the most significant pests and diseases for which pollinator-harming pesticides are used, and identifying non-chemical IPM practices for managing pest and disease issues identified.

Agencies and the University may also explore other strategies to facilitate this reduction, which may include development of new BMPs, new insurance or compensation programs to minimize financial impacts on farmers, increased Extension outreach on non-chemical alternatives, etc. Additionally, MDA will update pollinator lethal pesticide list every 2 years.

Funding: The Legislature should provide reasonable appropriations to fund the development of the required Agency and University Plans of Action. Alternatively, MDA could assess a new, small fee on sales of all pollinator-harming pesticides. Funds collected through this fee could be used to fund this program.

Timeline: While this will take time to implement, agencies will begin implementation in 2020.

Evaluation: The MDA and UMN should collaborate to create metrics to measure reductions. This includes generating or updating a list of pesticides known to be harmful to pollinators, and creating measurement systems to determine if and how reductions are made.

Challenges: Securing appropriate funding is a legislative barrier to implementing any program. Dedicating resources and time to interagency cooperation can also be a challenge, but the Environmental Quality Board has an already established Interagency Pollinator Team that could take on this work.

3. Increase awareness and adoption of the new federal Conservation Stewardship Program (CSP) Enhancement E595116Z2 and develop a similar state-level program for non-CSP farmers for planting corn/soy seeds not treated with neonicotinoids

Rationale: The goal of CSP Enhancement E595116Z2 is to reduce routine neonicotinoid insecticide seed treatments on corn and soybeans. If farmers were made more aware of the financial incentives to not use neonicotinoid treated seeds more farmers would participate in this program.

Responsible entities: Education/outreach should be completed by corn and soybean growers associations, extension offices, IPM educators, farm agency staff, conservation planners, etc. New state-level program that models federal program but is more widely accessible to any MN corn/bean farmer (not just those enrolled in CSP) should be developed by s [sic]

Implementation: Through trainings and outreach efforts, ensure that MN corn and soybean growers are aware of the new federal CSP Enhancement E595116Z2, and have the guidance they need to decide if this enhancement is a good fit for their cropland (given historic pest pressure, etc.). Since this enhancement is currently only available to farmers enrolled in the CSP program (roughly 5% of MN farms), develop similar state-level program to provide compensation for the same action taken by non-CSP farmers (a change from neonic-treated to untreated seed, for up to five years). Assess compensation rate provided under CSP enhancement (\$4.95 in MN) to determine if this amount is adequate to encourage a significant number of MN farmers to enroll.

This strategy could result in a meaningful reduction of neonicotinoids applied in our state, and would be achieved in farmer-friendly way (rewards farmers for positive environmental action vs. penalizing for detrimental action).

Funding: Outreach on existing program is low or no cost. Creation of new state level program would need funding allocated to this issue.

Timeline: This work should begin ASAP. Federal CSP enhancement is available for farmers this growing season, and onward.

Evaluation:

Challenges:

4. Enhance existing programs intended to prevent the introduction and establishment of invasive species and encourage the use of Integrated Pest Management (IPM) practices to control the spread of new and existing invasive species to reduce the need for pesticide applications and their unintended environmental impacts

Rationale: Invasive species are a driving force behind pesticide use and pesticide use can have unintended environmental consequences including potential effects on pollinators. From both a short and long-term perspective, preventing the introduction and spread of invasive species (invasive plants/weeds, insects, and diseases; including honey bee pests and diseases), with a stronger focus on prevention and eradication within an IPM strategy, may reduce the current and future use of pesticides and pollinator exposure to pesticides.

The socioeconomic and environmental costs of managing invasive species are huge and growing and mitigating the effects of invasive species is a constant and growing battle. As a result, a more serious and sustained commitment to manage existing and new invasive species is needed and has the potential to reduce pesticide use over time and avoid the need for increased pesticide use in the future (all pesticides – insecticides, herbicides, fungicides, miticides, etc.).

While invasive species prevention and management programs already exist, they lack the funding, and sometimes the will, needed to proactively prevent the introduction and establishment of new invasive species too often results in inadequate prevention and management initiatives and failed efforts. The necessity to rely on pesticides to maintain quality, yields, and profitability can also result in pesticide resistance which complicates the ability to combat invasive species threats.

Responsible entities: Minnesota Department of Agriculture (MDA), Minnesota Department of Natural Resources (MNDNR), Minnesota Board of Water and Soil Resources (BWSR), Minnesota Invasive Species Advisory Council (MISAC), Minnesota Invasive Terrestrial Plants and Pests Center (MITPPC), and other relevant agencies and groups.

Implementation: To be effective, the state must recognize the importance of invasive species prevention and management efforts as a means to decrease current and future pesticide use and embrace the need for a comprehensive, targeted, statewide, outcome-focused invasive species prevention and management strategy. The state agencies should identify gaps in invasive species identification and management, and gaps in funding for these efforts. An increased commitment and increased support of the existing and enhanced, outcome-based efforts to prevent the establishment and spread of new and existing invasive species is needed to reduce the need for pesticide applications and the potential for negative environmental impacts. Sustained support of current and future research efforts focused on the management of invasive species will be needed to realize improved invasive species management outcomes.

Funding: Agency budgets supported by legislative funding, Targeted Legislative-Citizen Commission on Minnesota Resources (LCCMR) funding for research.

Timeline: An ongoing initiative, shorter-term results are also possible with adequate funding and a focused strategy.

Evaluation: Preventing the introduction and spread of invasive species must be the primary objective and the agencies must be held accountable if these goals are not met; the introduction and establishment of new invasive species and the spread of invasive species already in the state should be tracked and existing invasive species threats should be prioritized and targeted for management and eradication in a strategic manner.

Challenges: Funding is the primary challenge; a poor understanding of the seriousness of the growing invasive species threat; potential impacts on commerce and other human activities; and too often, can't be done attitude.

D. Reduce use of neonicotinoid insecticides

Rationale: Neonicotinoid insecticides are a class of neuroactive chemicals that include the most widely-used insecticides in the country. A robust and growing body of research shows the many ways that neonicotinoids are harmful to pollinators, even at sublethal levels. Exposure to neonicotinoids impacts the learning, foraging, immune health and overall hive fitness of pollinators. Neonicotinoids reach pollinators through spray drift, dust from pesticide-coated seeds, uptake and expression by flowering plants, watershed contamination, and wind erosion in contaminated soil. These recommendations strive to reduce use of neonicotinoid insecticides as a targeted approach to pollinator protection. The expectation is that reducing the use of this class of pollinator-toxic insecticides would have measurable benefits to pollinators.

1. Restrict the use and sale of neonicotinoid insecticides to licensed applicators

Recommendation summary: The MDA should restrict the use and sale of neonicotinoids so that they can only be purchased and applied by certified applicators.

Rationale: Neonicotinoids, as mentioned above, are the most widely used insecticide in the world, and they are used by homeowners, farmers, and nursery growers. The general public can purchase neonics and use them at their discretion. While this use does not make up a large percentage of overall neonic use, the individual application rates are much higher, and can be above LD50 rates for honey bees. Restricting use and sale of neonics to only certified applicators would protect pollinators from this exposure.

Responsible entities: Minnesota Department of Agriculture

Implementation: MDA can use its current authority to restrict the sale and use of neonicotinoids to certified applicators.

Funding: Funding for program administration should come from the MDA's Pesticide Regulatory Account or a newly created Pollinator Protection Account.

Timeline: Within one year of the publication of this report.

Evaluation: The MDA should create metrics to measure reductions.

Challenges: This recommendation should focus on outdoor uses of neonicotinoids. Neonicotinoid use to manage bedbugs, cockroaches, and other indoor pests need not be restricted under this recommendation.

2. Fully implement the MDA's recommendations in the Neonicotinoid Review

Recommendation summary: To the extent that these recommendations are not already being implemented, or covered in other GCPP recommendations, the subcommittee recommends full implementation of the 8 recommendations from the Minnesota Department of Agriculture's Review of Neonicotinoid Use, Registration, and Insect Pollinator Impacts in Minnesota, as listed here, and included in specific recommendations below. **Based on the review, the MDA identified several opportunities for action to minimize the impact of neonicotinoids on pollinators.**

1. MDA Neonic Review Action 1: Create a Treated Seed Program (Requires Legislative Action)

Recommendation summary: From the MDA's 2016 Review: "Currently, the State does not have the authority to regulate the sale and use of pesticide treated seeds; they are considered to be "Treated Articles" and not pesticides. Treated articles that meet USEPA's exemption criteria are not subject to USEPA or MDA pesticide regulations. The Treated Seed Program will provide the State with the authority to regulate seeds treated with pesticides. The program will also fund research to develop need based recommendations for the use of seed treatments. The program may also require that untreated seeds and seeds treated at lower pesticide application rates are available in the market. The program would be funded through a new pollinator protection account. Creation of such a program will require legislative action. The bill to create treated seed program was introduced in MN legislation in 2017. However, it was not approved."

Rationale: From the MDA's 2016 Review: "Seed treatments protect young plants against early-season soil and foliage pests, reduce potential risks to workers, minimize potential runoff to waterways, and lower the overall amount of pesticide usage. However, broad-scale and prophylactic uses of seed treatments with pesticides such as neonicotinoids may increase the risk to the environment and specifically to pollinators. Therefore, it is important that treated seed use decisions be based on the best available science and Minnesota specific conditions."

Responsible entities: 2019 Legislature and MDA

Implementation: MDA will implement once authority is given by the MN Legislature. From the MDA's 2016 Review: "The treated seed program will provide staff and resources to ensure a sound understanding of efficacy of seed treatment rates, scouting techniques, pest pressures, economic thresholds, planting technology differences, etc. In addition, farmers may not have ready access to untreated seed or seed treated at lower pesticide application rates. The MDA will continue to evaluate national and international research for its applicability to Minnesota specific conditions. The MDA will also work with the University of Minnesota and other interested parties to identify the research needs and projects. Appropriate changes will be introduced on the use of treated seeds based on the outcome of research data. The bill to create pollinator protection account was introduced in MN legislation in 2017. However, it was not approved."

Funding: The MDA, in their review, determined that funding will be provided by the pollinator protection account.

Timeline: 2019 Legislative session, 2020 crop year

Evaluation: We recommend evaluating based on whether a treated seed program is created.
OR Not necessary to determine success of program.

Challenges: As mentioned above, the creation of a treated seed program was introduced through legislation in the 2017 MN legislative session and was not approved.

2. MDA Neonic Review Action 2: Create a Dedicated “Pollinator Protection Account” (Requires Legislative Action)

Recommendation summary: From the MDA’s 2016 Review: “Create a dedicated “Pollinator Protection Account” funded through fees on pesticide treated seeds and on pesticides classified by the USEPA as moderately or highly toxic to pollinators on acute exposure basis.”

Rationale: The MDA has taken on and identified a number of different areas to work to improve pollinator populations. This committee, as highlighted in these recommendations, has additional recommendations to the MDA. In order to fund these diverse pollinator efforts, the MDA has recommended, through their 2016 Neonic Review, the creation of a Pollinator Protection Account.

Responsible entities: 2019 Legislature and MDA

Implementation: From the MDA’s 2016 Review: The program will carry out activities related to pollinators including evaluating and supporting research on economic thresholds, developing an educational campaign on use of pesticides, development of stewardship materials, etc. Creation of such an account would require legislative action.

Funding: From the MDA’s 2016 Review: “Funding will be provided through fees on pesticide treated seeds and on pesticides classified by the USEPA as moderately or highly toxic to pollinators on acute exposure basis” and will be determined by the Legislature.

Timeline: 2019 Legislative session, 2020 crop year

Evaluation: Success will be determined if a pollinator protection account is created OR Not necessary to determine success of program.

Challenges: As defined by the MDA in their 2016 neonic review, a portion of this account’s funding will come from fees on pesticide treated seeds, which would first require the creation of a treated seed program (MDA Review action 1.)

3. MDA Neonic Review Action 3: Require formal verification of need prior to use of neonicotinoid pesticides, where appropriate

Recommendation summary: From the MDA’s 2016 Review: “The MDA will ensure that applications of neonicotinoids are made only when a qualified individual verifies that there is a demonstrated pest problem and there is a need for neonicotinoid pesticide use. The MDA will develop a formal process for verification of need by a trained and approved individual prior to the use of neonicotinoid pesticides on crops.

These requirements would be phased in over time as Minnesota specific pest thresholds and similar need based guidance becomes available and would only apply to products and uses which have MDA approved need based guidance for their use.”

Rationale: From the MDA’s 2016 Review: “Application requirements restricting foliar application of neonicotinoid pesticide products on pollinator attractive food crops and commercially grown ornamentals while bees are foraging and until flowering is complete already exist on product labels. This includes applications to soybeans, the most important crop for neonicotinoid use in Minnesota. Under these requirements farmers would be able to apply neonicotinoids when the application is needed because of an imminent threat of significant crop loss, consistent with an Integrated Pest Management (IPM) plan, or when a predetermined economic threshold is met. However, what qualifies as an imminent threat or an adequate IPM plan requires further definition for Minnesota specific conditions.”

Responsible entities: 2019 Legislature and MDA

Implementation: From the MDA’s 2016 Review: “The MDA will work with the University of Minnesota (U of M) and other stakeholders to develop pest thresholds and acceptable IPM criteria that should be used to justify product application before final flowering for those products and crops which currently have these requirements on the label. The MDA will also work with the U of M and other stakeholders to develop need based guidance and acceptable IPM criteria for other significant crop uses of neonicotinoids.

As this criteria is developed there will be an education period where it is widely promoted through multiple channels including pesticide applicator training and in coordination with registrant stewardship and other educational activities.

Funding: Funding for program administration should be determined by the MDA.

Timeline: 2019 Legislative session, 2020 crop year

Evaluation: MDA is responsible for setting a management and evaluation schedule to track participating farmers. This program will be established on a trial basis lasting one four-year cycle of claim payments.

Challenges: In the MN 2017 Legislative Session, defining how this program would be implemented was a major concern to stakeholder groups. To move this forward the MDA must engage stakeholders, as articulated above, to ensure the program is both workable for farmers and rigorous in providing pollinator protection.

We also recommend fully implementing MDA Neonic Review Actions 4-8 and have not detailed them here both because they are articulated elsewhere in this document and already in process by the MDA. They are:

4. Develop an Educational Campaign for Homeowners and Residential Users of Insecticides
5. Review Product Labels for Appropriate Use of Neonicotinoids for Homeowners and Residential Users
6. Develop Minnesota Specific Pollinator Stewardship Materials
7. Increase Use Inspections for Insecticides that are Highly Toxic to Pollinators
8. Review Label Requirements for Individual Neonicotinoid Products

3. Limit use of neonicotinoid insecticides on plants to crops grown for food production except where needed

Rationale: Neonicotinoids are highly effective insecticides that may be necessary for food production at adequate levels to sustain world population. In order to preserve the future use of neonicotinoids in food production, while recognizing their harmful effect on pollinators and other beneficial insects, neonicotinoids should only be used on crops raised for human consumption or crops raised as part of the human food chain.

Neonicotinoid (systemic) insecticides represent an intrinsic risk to pollinators. They are designed to be taken up by plants and moved to all plant parts including pollen and nectar. They are long lived in the environment, water soluble. Neonicotinoid insecticides are the only class of insecticides which have been proven to disrupt the insects immune system, making them susceptible to pathogens and viruses. We should not be using them prophylactically in order to not build resistance.

Responsible entities: Likely Legislature, to be implemented by MDA.

Implementation: Through statute or administrative rule, limit use of neonicotinoid insecticides on plants to crops grown for food production or as part of the human food chain except when needed, pursuant to MDA decision, to provide protection against a specific pest and then applied in pre-approved methods for that pest and plant.

Funding: The Legislature should provide reasonable appropriations to fund the development of this program.

Timeline: 2019 Legislative session, implemented January 1, 2020.

Evaluation: Success will be determined if neonic insecticides are limited to crops grown for food production except where needed.

Challenges: MDA will need to create a clear system to define which crops are grown for food production.

4. Ban neonicotinoids for use in Minnesota for production, cultivation, or growing of decorative gardening or landscaping plants and nursery stock

Rationale: Neonicotinoids are highly effective insecticides that may be necessary for food production at adequate levels to sustain world population. In order to preserve the future use of neonicotinoids in food production, while recognizing their harmful effect on pollinators and other beneficial insects, neonicotinoids should only be used on crops raised for human consumption or crops raised as part of the human food chain.

Neonicotinoid (systemic) insecticides represent an intrinsic risk to pollinators. They are designed to be taken up by plants and moved to all plant parts including pollen and nectar. They are long lived in the environment, water soluble. Neonicotinoid insecticides are the only class of insecticides which have been proven to disrupt the insects immune system, making them susceptible to pathogens and viruses. If neonics are critical to the protection of food, we should not be using them prophylactically in order to not build resistance.

Responsible entities: Likely Legislature, to be implemented by MDA.

Implementation: Through statute or administrative rule, ban neonicotinoids for use in Minnesota for production, cultivation, or growing of decorative gardening or landscaping plants and nursery stock. An exception should be provided for regulated application to address a specific pest, such as emerald ash borer, when a pest presence has been demonstrated.

Funding: Funding for program administration should come from the Pesticide Regulatory Account or other MDA determined account.

Timeline: 2019 Legislative session, implemented January 1, 2020.

Evaluation:

Challenges:

5. Institute an immediate moratorium against all outdoor uses of neonicotinoid pesticides in Minnesota

Recommendation summary: Immediately prohibit all outdoor uses of neonicotinoid products in Minnesota

Rationale: Neonicotinoid (systemic) insecticides represent an intrinsic risk to pollinators. They are designed to be taken up by plants and moved to all plant parts including pollen and nectar. They are long lived in the environment, and are water soluble. Neonicotinoid insecticides are the only class of insecticides which have been proven to disrupt insects' immune systems, making them susceptible to pathogens and viruses. Strong evidence exists of damage to pollinators, including honey bees, monarch butterflies and other native pollinating species. When combined with evidence of damage to aquatic insect larvae and crustaceans, immediate suspension of use of this class of chemistry is warranted until such time as safe uses can be developed.

Responsible entities: Governor's Executive Order or 2019 Legislature, to be implemented by MDA.

Implementation: Neonic use will be suspended at a date to be determined by responsible entities.

Funding: Funding for program administration should come from the Pesticide Regulatory Account or other MDA determined account.

Timeline: Should be fully implemented by the 2020 planting season

Evaluation: Success will be determined if neonic insecticides are restricted in use and sale to certified applicators.

Challenges:

E. Reduce use of neonicotinoid-treated seeds

Rationale: These recommendations strive to reduce the use of neonicotinoid seed treatments, in particular. The expectation is that strategic reductions in seed treatments would have measurable benefits to pollinators, without impacting crop yield.

1. Require seed companies, wholesalers, or retailers to offer non-neonicotinoid treated versions of top corn seed varieties

Rationale: Farmers report that while neonic-free seeds are available, they can be very hard to find. Virtually all commercial seed corn is treated leaving the farmer little choice but to plant treated seed. The seed corn industry is highly concentrated.

Responsible entities: 2019 Legislature, to be implemented by MDA.

Implementation: Minnesota ought to require, by statute or administrative rule, seed companies, wholesalers or retailers, to offer non-neonicotinoid treated versions of their top corn seed varieties at all levels of or days to maturity.

Funding: Funding for program administration should come from the Pesticide Regulatory Account or other MDA determined account.

Timeline: Should be fully implemented by the 2020 planting season

Evaluation: MDA is responsible for setting a management and evaluation schedule to track participating seed companies, wholesalers and retailers.

Challenges: As with other recommendations in this section, the MDA must first be granted authority over treated seed regulation.

2. Discontinue neonicotinoid seed treatments in soybeans

Recommendation summary: Discontinue the use of neonicotinoid seed treatments, or other methods of pre-emergent insecticide applications, in soybeans.

Rationale: University Extension researchers have found that neonicotinoid seed treatments are rarely effective as soybean seed treatments in Minnesota – and sometimes harmful to crops by accelerating resistance or killing beneficial insects. MN soybean farmers only purchased neonic coated seeds for about 50% of their fields in 2017.

Responsible entities: 2019 Legislature, or to be implemented by MDA by rulemaking authority.

Implementation: The sale and use of neonic treated soybean seed in Minnesota will be phased out, to be discontinued by the 2020 planting season.

Funding: Funding for program administration should come from the Pesticide Regulatory Account or other MDA determined account.

Timeline: 2020 planting season

Evaluation: MDA is responsible for setting a management and evaluation schedule of relevant entities.

Challenges: As with other recommendations in this section, this will either need to be implemented by the legislature, or MDA must first be granted to regulate treated seed. This recommendation is likely to be most successful when paired with funding and technical assistance (as outlined in other recommendations) to support farmers to successfully make this transition.

3. Adopt in statute a goal to reduce the use of neonicotinoid seed treatments to only those justified by current or historical pest pressure

Recommendation summary: The MN Legislature should adopt in statute a goal to reduce the use of neonicotinoid seed treatments to only those justified by current or historical pest pressure, not to be replaced with another neonicotinoid treatment method.

Rationale: According to a [publication](#) from a number of Midwest land grant universities, including the University of Minnesota, there are a handful of specific situations in which neonicotinoid seed treatments are useful for managing early season pests in soybeans. The publication explains that these situations are “uncommon in northern states” like Minnesota. The research is less conclusive regarding seed treatment use in corn, but indicates that there may be a similar overuse of seed treatments in field conditions in which it is not highly effective. This is not likely due to any irresponsible intent on the part of farmers, but simply the norm that most corn and soybean seed sold is pre-treated with neonicotinoids. This recommendation would shift the “norm” -- untreated seed should be planted unless there is evidence of pest pressure or field conditions that would call for use of a seed treatment, instead of planting treated seed on most acres in the state.

Responsible entities: 2019 Legislature, to be implemented by MDA.

Implementation: MN Legislature should grant the MDA regulatory authority over pesticide application through the use of treated seeds. The MDA should be directed to begin to track the use of pesticide seed treatments immediately. Explore other strategies to facilitate this reduction, which may include development of new BMPs, new insurance or compensation programs to minimize financial impacts on farmers, increased Extension outreach on non-chemical alternatives, etc. *References and resources:* [Ontario’s approach](#)

Funding: The Legislature should provide reasonable appropriations to fund the development of this program. Funding for program administration should come from the Pesticide Regulatory Account or other MDA determined account.

Timeline: Goal adopted in the 2019 Legislative Session, full implementation by 2025 planting season

Evaluation: After three years, the MDA shall assess:

- The reduction in the use of neonicotinoid seed treatments, not replaced by another neonicotinoid treatment method.
- The economic impact, positive or negative, on farmer livelihoods in Minnesota resulting from reduced use of neonicotinoids, and
- Pollinator populations.

Challenges: The state will need to develop an effective and efficient mechanism to work with farmers to verify that field conditions or pest history call for the use of neonicotinoid seed treatments. Ontario’s model can be a starting point, though Minnesota will need to consult with farmers, crop consultants, seed dealers, and other stakeholders to determine the most effective process for this. As with other recommendations in this section, this will either need to be implemented by the legislature, or MDA must first be granted to regulate treated seed.

4. Significantly reduce use of neonicotinoid insecticide seed treatments in corn

Recommendation summary: Discontinue the use of neonicotinoid seed treatments, or other methods of pre-emergent insecticide applications, in corn.

Rationale: Research on specific situations where neonicotinoid seed treatments are useful for managing early season pests is less conclusive regarding seed treatment use in corn than in soybeans, but indicates that there is a similar overuse of seed treatments in field conditions in which it is not highly effective.

Responsible entities: 2019 Legislature, or to be implemented by MDA by rulemaking authority.

Implementation: The sale and use of neonic treated corn seed in Minnesota will be significantly reduced. Neonicotinoid-treated corn, or other pre-emergent neonicotinoid insecticide applications, will be available as needed to farmers for planting acres where there is a demonstrated pest presence.

Funding: Funding for program administration should come from the Pesticide Regulatory Account or other MDA determined account, or through legislative appropriation.

Timeline: ongoing, significant reductions achieved by 2020 planting season.

Evaluation: MDA is responsible for setting a management and evaluation schedule of relevant entities.

Challenges: As with other recommendations in this section, this will either need to be implemented by the legislature, or MDA must first be granted authority to regulate treated seed. This recommendation is likely to be most successful when paired with funding and technical assistance (as outlined in other recommendations) to support farmers to successfully make this transition.

5. Discontinue neonicotinoid insecticide seed treatments in other Minnesota crops that are highly attractive to pollinators

Rationale: Neonicotinoids are systemic and move to all plant parts including pollen and nectar and should not be used on pollinator attractive crops.

Responsible entities: 2019 Legislature, or to be implemented by MDA by rulemaking authority.

Implementation: Discontinue use of neonicotinoid insecticide seed treatments, without substituting a different pre-emergent neonicotinoid application method, in other Minnesota crops that are highly attractive to pollinators, like canola, sunflower, edible beans and other fruit and vegetable crops where neonic insecticide seed treatments are currently used.

Funding: Necessary funding to be budgeted by responsible entity.

Timeline: Goal adopted in the 2019 Legislative Session, full implementation by 2025 planting season.

Evaluation: MDA is responsible for setting a management and evaluation schedule of relevant entities.

Challenges: As with other recommendations in this section, this will either need to be implemented by the legislature, or MDA must first be granted to regulate treated seed. This recommendation is likely to be most successful when paired with funding and technical assistance (as outlined in other recommendations) to support farmers to successfully make this transition.

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GOAL 3: MINNESOTANS UNDERSTAND, VALUE, AND ACTIVELY SUPPORT POLLINATOR POPULATIONS

Rationale: To conserve and enhance pollinator populations for future generations, it is vital to educate all Minnesotans about the value of pollinators to our food systems and ecosystems. These recommendations strive to promote education about the biology of pollinators, their habitat needs, and the use of pesticides through our state.

A. Increase education in K-12

1. Include the importance of pollinators and their habitat, as appropriate, in resources developed for teachers within and related to the next version of science standards.

Recommendation summary: Pollinators are a critical piece of ecological and food production systems both in Minnesota and globally. The Minnesota Science Standards are under review and revision in 2018 and 2019. During this process, benchmark language associated with various standards that are developed could be drafted to include references to and examples of how standards can be accomplished and evaluated utilizing pollinators and their habitat as topical teaching platforms. Resources such as lesson plans and suggested activities to accomplish standards that relate to pollinators and their habitat will be shared with various organizations that provide teacher's resources such as SciMathMN and the DNR School Forest curriculum resource groups.

Rationale: These standards will endure for 10 years, offering significant opportunity to expose Minnesota students to pollinator-related topics and activities and enhance general understanding of the value of pollinators, the threats they face, and how to support their populations.

Responsible entities: MDE/Science Standard Review Committee (Starting August 1-3, 2018); input and curricular resources provided by members of the GCPP and others.

Implementation: The 2018-2019 Science Standard revision process should include standards reflecting the importance of pollinators and their habitat and/or include benchmark language that references pollinator-related issues where appropriate. This recommendation comes from the GCPP committee, and may be furthered by member(s) of the committee working directly with Minnesota Department of Education (MDE) staff and/or the Science Curriculum Review Committee (Application Process - March, 2018) including examples that utilize pollinator habitat.

Identify/contact members of the Science Standard Review Committee to discuss the process and approaches to integrating pollinator references / benchmarks into revised standards. Multiple input periods for public comment, of which the GCPP could be a part.

Identify areas where referencing pollinators in benchmark language is appropriate and enhances a standard area. Develop and/or share existing curricular materials through the SciMathMN

framework resource webpage and other portals that provide curricular resources to teach using pollinators as a subject and resource.

Funding: Minimal staff time/expense

Timeline: Connect with the science standard review committee in fall, 2018 and identify when and where suggestions can be provided on how to accomplish this goal.

Evaluation: Degree to which or number of times that pollinators and / or pollinator habitat considerations are referenced in the new standards.

Challenge: Lots of suggestions for alternative topics/language where this could be accomplished.

B. Increase the availability of pollinator resources to the general public

1. Increase availability of pollinator-related resources in libraries

Rationale: Libraries are a public resource and providing programmatic content for libraries is part of the Department of Education's work.

Responsible entity: MDE

Implementation: State agencies, federal, and university partners should work with the MDE to ensure that all resources related to pollinators, pollinator habitat, and pollinator research published in the format required by the MDE Library are made available through the Minnesota Library System to the greatest extent possible, including hard copies, eBooks, and other appropriate formats. Identify format/sourcing requisites and then compile list of materials that fits these parameters. Example: eBooks – a DNR staff member has been working with the MDE to get some pollinator resources into ebooks format (available online).

Funding: Utilize existing resource sharing/distribution channels

Timeline: Has already begun as of summer 2018, Ongoing.

Evaluation: not applicable for this recommendation.

Challenges: Compiling the list itself, delivering materials to the library system for inclusion

2. Amend Minnesota statute to designate all currently reported pesticide use data as public

Rationale: While pesticide applicators are currently required to maintain accurate records of pesticide use, these records are not available to the public. Removing this barrier to transparency would allow farmers, beekeepers and scientists to easily determine whether nearby pesticide applications could be harmful to pollinators or damage property—a process that is only currently possible via word-of-mouth reporting between neighbors. In the event of a drift incident or bee kill, public access to pesticide data could speed up MDA's reporting process. Additionally, our knowledge of pesticides' toxicity to pollinators is continually building. Increased access to and better understanding of pesticide use data increases our knowledge about how best to protect pollinators.

Responsible entities: 2019 Legislature, implemented by the MDA.

Implementation: Current certified pesticide applicators in MN are required to keep records of pesticide applications and submit records upon MDA request. This amendment would require that these records be available to the public. These reports are already required by MN Statute. There is national precedent; a number of states use public pesticide use reporting, with varying models for sharing the information with the public. .

Funding: Through legislative appropriation

Timeline: 2019 Legislature, implemented January 1, 2020.

Evaluation: Not necessary to determine success of program.

Challenges: Program will need to be implemented, as it is in other states, with privacy in mind.

3. Provide continued funding for an enhanced pollinator extension education and outreach program at the University of Minnesota along with the funding needed to maximize pollinator education across the state of Minnesota

Rationale: Recognizing the importance of education in the protection of managed and native bees and other pollinators, the Minnesota Department of Agriculture, together with University of Minnesota Extension and other state and local partners (including input from agricultural and other industry partners), should develop a science-based, statewide, pollinator-specific education plan for pesticide manufacturers, sellers and applicators (certification), beekeepers, agricultural producers, land managers, and the general public; the resulting education plan should focus on pollinator best management practices including the provision of quality pollinator habitat and the proper and judicious use of pesticides; a permanent, statewide, pollinator-specific, extension educator position (or positions as needed) should be created to coordinate and lead the implementation of this recommendation.

Responsible entity: University of Minnesota Extension

Implementation: Implementation of this recommendation should begin with a review of the statewide education needs related to pollinator education followed by the development of a plan that outlines a set of the key goals related to pollinator education in the state and the personnel and other resources needed to achieve those goals.

Funding: Federal extension funding supplemented by state funding

Timeline: Ongoing.

Evaluation: Documentation of educational activities and their impacts.

Challenges: Funding is likely the primary challenge

C. Increase education and support for beekeepers

1. With a focus on education, information gathering, and inspection.

Reinstate the state Apiary Authority within the Minnesota Department of Agriculture (MDA) and create a bee registry with education and inspection

Rationale: Given the ongoing concerns about honey bees and their central role in the pollination of a variety of agronomic and horticultural crops, actions that are specifically designed to address the protection of managed bees including European honey bees and other managed bees are needed. Most pollinator protection plans include specific recommendations for honey bees and should not be overlooked in efforts to protect honey bees in the State of Minnesota.

The value of the pollination provided by honey bees and concerns about honey bee health are issues that are specifically included in Governor Dayton's Executive Order 16-07 (*Directing Steps to Reverse Pollinator Decline and Restore Pollinator Health in Minnesota*; August 2016) and therefore should not be ignored. This recommendation is also consistent with the apiary authority and programs in all neighboring states and across the country.

Responsible entities: Minnesota Legislature, Minnesota Department of Agriculture (MDA); Minnesota beekeepers.

Implementation: Specific to European honey bees (*Apis mellifera*) and other bees, including bumble bees (*Bombus* spp.), that are managed to provide pollination services and/or the production of honey, pollen, and other bee-related products, and in support of education, pest tracking, and research efforts focused on bee health and pest management, the Minnesota Legislature should reinstate the Apiary Authority in the Department of Agriculture (MDA). MDA should create an online bee registry and a requirement that all resident bee colonies be individually labelled and registered with the MDA and inspected for health purposes on an ongoing basis (fee-based).

For the purposes of pest tracking, assessing honey bee health, and research efforts focused on honey bee health and pest management, the gathering of contemporaneous, colony-specific information related to the source of the bees, management practices, pesticide treatments and outcomes, colony losses, and other data could be useful in tracking honey bee populations and health, pest abundance, and pesticide use and efficacy and should be considered as part of the proposed apiary program.

Education focused on the status of managed pollinators and pollinator pests in the state, honey bee best management practices, and pollination protection programs and resources like [BeeCheck](#), [DriftWatch](#), and [FieldWatch](#) should also be a key component of the program.

To be successful, the proposed apiary program should be cooperative effort with input from beekeepers and other stakeholders as well as those involved in bee research and management should be sought as guidance for creating the framework of the program. The creation of a stakeholder advisory committee should also be considered to promote such cooperation.

Funding: The proposed apiary program should generally be self-supporting through a standard fee per beekeeper. .

Timeline: The basic program should be active within two years (December 2020).

Evaluation: Potential metrics include colony and health statistics, a summary of education activities and resources produced, and an annual status report to the commissioner of agriculture and the governor (available to the general public).

Challenges: Funding will be required and lack of consensus within beekeeping community.

2. Continue active partnership in the national strategy to improve honey bee health

Rationale: To avoid duplication of effort, maximize resources and impact, and promote enhanced outcomes related to improving pollinator populations and health, the State of Minnesota should be an active partner in the national strategy to improve honey bee health.

Responsible entities: The Governor's Office and all pertinent state agencies.

Implementation: The various agencies of the State of Minnesota should proactively develop working partnerships with federal agencies and neighboring states to promote and enhance the implementation of the *National Strategy to Promote the Health of Honey Bees and Other Pollinators* (Pollinator Health Task Force, 2015;) within Minnesota and neighboring states with a focus on measurable outcomes and should report new and continuing initiatives and achievements to the Governor of the State of Minnesota and the Governor's Committee on Pollinator Protection on an annual basis.

Funding: Agency budgets with federal assistance as appropriate and available.

Timeline: Ongoing.

Evaluation: Goals that achieve measurable outcomes should be set and reviewed and updated as needed on an annual basis.

Challenge: Meaningful cooperation can be difficult.

D. Increase research and monitoring of native pollinator populations and habitat

1. Create a native pollinator and habitat documentation and tracking program

Rationale: Recognizing the importance of the services provided by native pollinators in agricultural systems and native ecosystems, that baseline documentation of the native species of bees and other insect pollinators in Minnesota is incomplete, and a need to track native pollinator populations and health, the State of Minnesota should create a program dedicated to documenting Minnesota-native pollinators, their habitat requirements, and existing pollinator habitat and habitat needs. The program should also actively promote and support research efforts focused on the identification, population dynamics (distribution and abundance), and habitat requirements of the pollinator species that are native to Minnesota in order to accurately document the species of pollinators that are native to Minnesota and understand their habitat needs. Some of these activities are ongoing, but are limited and need to be formalized as part of a strategic effort. These efforts will enhance our understanding of native bees and other pollinators and will provide the statistically-sound, baseline information on the

distribution and abundance of these species that are needed to support ongoing efforts to accurately track changes in the population dynamics of native pollinators.

Responsible entities: The Minnesota Department of Natural Resources and the University of Minnesota are already involved in these types of activities and should be the lead entities in these efforts; the Board of Water and Soil Resources may also have a role to play (habitat mapping, establishment, and management).

Implementation: Provide the funding and personnel required to achieve the goals outlined in this recommendation.

Funding: The Clean Water, Land and Legacy Amendment may be a source of initial funding, Minnesota Department of Natural Resources budget, grant funding (public and private).

Timeline: Ongoing with annual goals.

Evaluation: Demonstrated success in the documentation of pollinator species and habitat on an annual basis.

Challenges: Recognition of the importance of these efforts and dedicated funding.

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RESOURCES

Integrated Pest Management

Integrated pest management (IPM) is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment.

The IPM approach can be applied to both agricultural and non-agricultural settings, such as the home, garden, and workplace. IPM takes advantage of all appropriate pest management options including, but not limited to, the judicious use of pesticides. In contrast, *organic* food production applies many of the same concepts as IPM but limits the use of pesticides to those that are produced from natural sources, as opposed to synthetic chemicals.

IPM is not a single pest control method but, rather, a series of pest management evaluations, decisions and controls. In practicing IPM, growers who are aware of the potential for pest infestation follow a four-tiered approach. The four steps include:

- **Set Action Thresholds.** Before taking any pest control action, IPM first sets an action threshold, 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 will either become an economic threat is critical to guide future pest control decisions.
- **Monitor and Identify Pests.** Not all insects, weeds, and other living organisms require control. Many organisms are innocuous, and some are even beneficial. IPM programs work to monitor for pests and identify them accurately, so that appropriate control decisions can be made in conjunction with action thresholds. This monitoring and identification removes the possibility that pesticides will be used when they are not really needed or that the wrong kind of pesticide will be used.
- **Prevention.** As a first line of pest control, IPM programs work to manage the crop, lawn, or indoor space to prevent pests from becoming a threat. In an agricultural crop, this may mean using cultural methods, such as rotating between different crops, selecting pest-resistant varieties, and planting pest-free rootstocks. These control methods can be very effective and cost-efficient and present little to no risk to people or the environment.
- **Control.** Once monitoring, identification, and action thresholds indicate that pest control is required, and preventive methods are no longer effective or available, IPM programs then evaluate the proper control method based on effectiveness and risk. 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, identifications and action thresholds indicate that less *risky* controls are not working, then additional pest control methods would be employed.

Source: www.epa.gov/safepestcontrol/integrated-pest-management-ipm-principles

Invasive Species

An invasive species is a non-native organism (plants, animals, insects, and diseases) whose introduction causes or is likely to cause economic or environmental harm or harm to human, animal, or plant health and does not provide an equivalent or greater benefit to society.

Adapted from Executive Order 13751 (2016; <https://www.doi.gov/invasivespecies/executive-order-13751>) and the National Invasive Species Council Management Plan 2016-2018 (<https://www.doi.gov/sites/doi.gov/files/uploads/2016-2018-nisc-management-plan.pdf>)

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