TREES, POLLINATORS, AND RESPONSIBLE PESTICIDE USE FOR MINNESOTA'S WOODLANDS

Minnesota Department of Natural Resources

North American Pollinator Protection Campaign (NAPPC)

Cover photos clockwise from top right:

Honeybee, Bill Johnson ©

Fall trees, courtesy Alan Jones

Aerial spray plane, Ken Hammmond, USDA ARS ©

Tiger Swallowtails, Bill Johnson ©

TREES,

POLLINATORS,

AND

RESPONSIBLE

PESTICIDE USE

FOR

MINNESOTA'S WOODLANDS

Minnesota
Department of
Natural Resources

North American Pollinator
Protection Campaign
(NAPPC)

INTRODUCTION

This publication is intended to serve two main audiences:

1- people who own, grow, and manage trees including forests, plantations, windbreaks and shelterbelts, and shade and ornamental trees in urban settings;

2- pesticide applicators, including both commercially licensed applicators and members of the general public who use pesticides.

Managing trees requires great vigilance against pests to ensure adequate production and growth. It is vital that owners and managers of trees and forests be trained in pest management practices that promote healthy trees and forests, healthy populations of beneficial insects such as pollinators, and healthy natural ecosystems.

TREES IN MINNESOTA

Forests and trees are important for people and wildlife. In Minnesota, trees are used to provide fiber for paper production and produce structural lumber and building products, millwork, cabinetry and furniture, pallets, wood shavings, and materials for the wreath industry. The wood industry in Minnesota is the 4th largest manufacturing industry and employs in excess of 53,000 people. (Jacobson, 2004). Trees stabilize lake, river and stream banks, help purify water and clean the air we breathe, and serve as important sinks for greenhouse gases. Trees beautify our cities and the rural countryside. Forests are favored locations for recreation activities. For some, both trees and forests are sources of spiritual contentment. They also are becoming increasingly more important as a source of biomass to meet energy needs; they provide means to absorbing carbon dioxide from the atmosphere; and they help in reducing pollution levels in the air, soil, and ground water.

Many species of wildlife and insects rely on trees and forest habitats for survival. However, some insects cause tree damage and mortality by feeding on the leaves and needles; boring into wood and under bark; infecting trees with disease organisms; and weakening the trees so that secondary organisms become established. The protection of trees, wherever they have economic or environmental value, is a matter of concern. Use of pesticides is one approach that can be used to protect trees and forests. Responsible use of pesticides is essential to remedy pest problems, but they must be used in a way that protects the insect pollinators that visit forest flowers and promote healthy woodlands.

Photo courtesy Alan Jones

THE ROLE OF POLLINATORS

Pollinators perform a service crucial for human survival. Agricultural, forested, and other natural ecosystems of Minnesota and the world rely on the work of pollinating animals, mostly bees, but also other insects like butterflies, beetles and flies, and birds and bats, that transport pollen from flower to flower. Pollination triggers the process of reproduction in plants, allowing them to set seeds and bear fruit. Pollinators are attracted to a variety of blooming flowers on forbs, shrubs, and trees, and may visit multiple species for nectar and pollen throughout the growing season. In agriculture, bees pollinate valuable crops such as orchard fruits and sunflowers, allow alfalfa and legume forages to produce seeds, and are required for pollination of field crops such as pickling cucumbers, melons, and pumpkins. Pollinators can also be found on flowering trees and shrubs found in Minnesota, such as basswood, pear, dogwood, apricot, azalea, chokeberry, cherry, Juneberry, lilac, plum, currant, blueberry, blackberry, and magnolia.

In forested and other natural areas, pollinators assist in the production of fruits and seeds that are essential to the diets of wildlife such as small and large mammals, and especially migratory and game birds. It is those seeds and fruits, consumed and dispersed by wildlife, that maintain natural ecosystems and can help revegetate areas disturbed by natural events or commercial harvesting and development. Even today, wild fruits and seeds are important dietary staples for

American Indian populations, and collecting fruits and seeds is an important recreational activity for many Minnesotans. Pollinating animals are central to this fruit and seed production and to overall environmental sustainability.

In managed environments such as agricultural fields and home gardens, honeybees, which were imported to this continent with the earliest European colonists, are acknowledged as the most important pollinators. Their estimated value to agricultural production runs as high as $40 billion annually in the U.S. alone. In forested and wild ecosystems, the diversity of pollinators is great, and pollination is not strictly tied to honeybees. The United States is home to more than 4000 species of native bees. Whenever flowering plants are in bloom, many kinds of bees, butterflies, moths, beetles, flies, and hummingbirds may be seen foraging and pollinating while also offering beautiful displays of colors, shapes, and sounds. Keeping pollinators safe from harm while they forage on blooming flowers is critical to maintaining healthy ecosystems.

Photo by Marla Spivak, Univ. MN ©

Photo by Ron Nichols, USDA NRCS ©

PESTICIDES

Pesticides are agents used to manage unwanted organisms. Pesticides are grouped according to the target that is intended to be controlled. Some examples include insecticides, fungicides, herbicides, nematicides, miticides, and rodenticides. Each of these pesticide groups is selectively toxic to insects, fungi, plants, nematodes, mites, and, rodents respectively. Although pesticide toxicity is usually selective enough that pesticides in one group are not highly hazardous to life in another group, sometimes their toxicity and/or application methods can have deleterious effects on non-target animals, including pollinators.

Even if a chemical pesticide does not have a lethal effect on a particular organism, it can alter it in ways that can be difficult to measure. For example, with honeybees government label requirements only test for bee death, but subtle yet significant changes can result from a sub-lethal exposure to pesticides, by adversely affecting nesting behavior, orientation and learning, brood and cell production, and increasing the mortality of immature bees.

Insecticides are potentially the most toxic of all the pesticides to pollinators because most pollinators are insects. Fungicides and herbicides do not normally kill pollinators directly, except in extreme and experimental doses. However, pollinators may be indirectly harmed by herbicide applications when herbicides destroy the flowers on which foraging pollinators depend. Some nematicides and miticides are toxic to pollinators. Rodenticides may be toxic to bat and bird pollinators.

USEFUL PESTICIDE TERMS

The language of pesticides can be confusing at first; the following definitions are provided to help clarify the choices for consumers and professional pesticide applicators.

• **Pesticide formulations** contain an active pesticide ingredient plus various other ingredients used to improve the performance of the pesticide by affecting such characteristics as handling, persistence on foliage, safety, ease of application, and ability to mix with water.

• **Emulsifiable concentrates (EC)** are liquid formulations with active ingredients that are insoluble in water. The addition of an "emulsifier" allows the pesticide to mix with water, forming an emulsion.

• **Wettable powders (WP)** are pesticides formulated on dry particles and contain ingredients that allow the particles to mix with water, resulting in a mixture referred to as a suspension.

• **Dusts** are formulations of pesticides on dry particles that are applied dry. Formerly widely used, few dust formulations are currently produced because of difficulties in application, excessive drift, hazards to honeybees, and potential for inhalation by applicators.

• **Micro-encapsulated** pesticides are impregnated into tiny, slow-release plastic or organic beads and mixed into a liquid. They may have somewhat longer residual life, but are often more expensive and can increase hazards to honeybees.

(Modified from: http://pested.unl.edu/study04.htm)

Photo by Ken Hammond, USDA ARS ©

FACTORS THAT INFLUENCE PESTICIDE EFFECTS

Many factors can contribute to the effects pesticides may have on unwanted as well as beneficial organisms. These factors may include the pesticides' residual toxicity, chemical formulations and additives, methods of application, and the timing with which they are applied.

ERTs and Non-ERTs

There are two classes of insecticides:

1) ERT's (Extended Residual Toxicity) ERT's are toxic longer than 8 hours. They can be identified by the word 'residue' in the bee caution text, or they will have an actual time of toxicity listed as greater than 8 hours.

2) Non-ERT (Non- Extended Residual Toxicity). A label for a non-ERT insecticide will not use the word 'Residue' in its 'bee caution' or will list a toxic time of less than 8 hours.

If an insecticide application is necessary, a non-ERT insecticide should be chosen.

Formulation and additives

The formulation of a pesticide is the combination of the active ingredient with other inactive substances that

make handling and application safer, easier, and more efficient. Formulations greatly influence the potential hazard of a pesticide to pollinators.

Pesticides formulated and used as dusts and wettable powders (WP) are generally more hazardous than the emulsifiable concentrates (EC) used in spray applications. Micro-encapsulated formulations can pose very high risks to bees because worker bees may inadvertently pick up the capsules mistaking them for pollen. The bees may then return to their nests or colonies with the pesticide, where it can be stored up to a year before being used, possibly poisoning the bees long after application. Bee bodies are designed to have pollen adhere to their furry legs, sides, or in special pollen baskets. Pesticides that mimic or adhere to pollen are especially toxic.

Granular formulations use large granules of 2 to 40 percent active ingredients and are applied to the soil, generally for slow release, thus greatly reducing potential drift effects of the pesticide. Granular formulations are relatively safe to honeybees.

Systemic formulations offer pesticides in a form that can be moved (translocated) from the site of application to sites within the plant or animal where they become effective. A systemic formulation might be absorbed via foliage and translocated throughout the plant where it becomes effective against chewing or sucking insects. Systemic pesticides are generally safe to pollinators, but some are translocated within the plants into pollen and nectar, where they may be consumed inadvertently. These pesticides also may be toxic to pollinators in the larval stage if they use the target plant as a food source. Some of the newer and highly toxic systemic insecticides are still being tested for their safety to pollinators.

Stickers, which are substances used to make the pesticide "stick" on the surface of the plant and are used with WP, EC, and micro-encapsulated formulations, seem to reduce the hazard posed to pollinators because the pesticide material is less accessible. However, there is the potential for a sticker to be used in conjunction with an extended length residual or a micro-encapsulated insecticide, which can inadvertently 'stick' the insecticide to pollen being released by a plant. The pollen could subsequently be brought back to

Photo by Umberto Moreno ©

the pollinator's 'nest' where it would be continuously toxic to native bees and their larvae as the stored pollen is used over time.

Method of application

Different formulations can also be applied using different application methods, including spraying or dusting by air or from wheeled equipment on the ground, hand-held and backpack spray applications, and direct spot applications where the pesticide is applied directly to the plant by wipes or precise sprays. Aerial applications are more difficult to control than ground applications, especially under windy conditions. Wherever possible, pesticide applicators should use application methods that are close to the target, use the minimal amount of pesticides to be effective, and have the least possibility of non-target impact (drift to adjacent plants, for example).

Timing of application

Timing of pesticide applications can also minimize the hazard to pollinators. Generally, but not always, pollinators are active after dawn and during the warmest part of the day. Some important crop pollinators such as the squash bee and the blue orchard bee (see "Other Native Pollinators in Minnesota" below), however, have made their contributions to flower production well before the familiar honeybee is active. Therefore, even early morning applications may have toxic effects though they are an improvement over midday application. Spray applications should be timed to minimize impact on pollinators by applying pesticides in the late afternoon or evening to allow the toxicity to decrease over an 8 hour period or more before pollinators become active again. These are generally the times when wind speeds are lowest and the danger of spray drift away from the target area is minimal.

Blooming crops should never be sprayed with insecticides, except under extreme situations. Unfortunately, where trees grow, there are usually blooming plants in the vicinity either in the understory or in natural openings in the forest, or between rows and along the edges in plantations.

Care should be taken to time the application late in the evening to allow the insecticide adequate time to activate and dissipate prior to pollinator activity during daylight hours, unless pollinators active in the evening are a concern at the target location.

Thus, special attention with respect to pesticide type, formulation, application methods, and timing is required.

OTHER NATIVE POLLINATORS IN MINNESOTA

Native bees from the genera Andrena (Andrenid bees, often referred to as "digger bees"), Anthophora (Cuckoo, Digger, and Carpenter bees), and Megachile (Leafcutter bees) are usually common early in the growing season. Most of them are spring or fall specialists and are abundant for short periods of time.

Orchard-mason bees (*Osmia lignaria*) are very effective pollinators of crops such as apples, while bumble bees such as *Bombus impatiens* are important for greenhouse vegetable production, as well as pollination of prairie wildflowers. The hoary squash

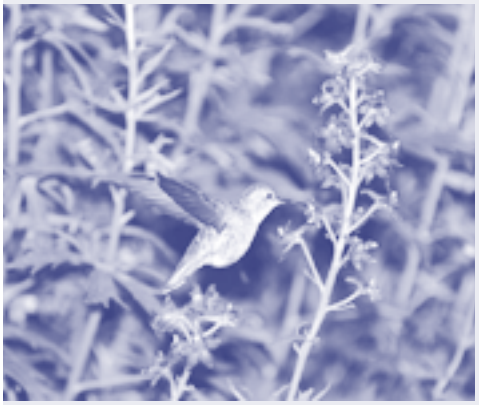

Photo by Bill Johnson ©

bee pollinates pumpkins and squash. The familiar small "sweat bees" are widespread and important pollinators of many native plants.

Syrphid flies have color patterns and flight behavior that closely resemble those of a bee or wasp. These flies help in pollinating a variety of native and cultivated flowers, and are also beneficial to gardens because their larvae prey on aphids and other small plant pests.

Butterflies: Monarchs, grass skippers, and hairstreak butterflies all visit Minnesota's wildflowers, helping to pollinate many and using others as larval food for their young or nectar sources while migrating. More and more, people are encouraging these showy insects in their gardens.

TREES, PESTICIDES, AND POLLINATORS

With such a broad range of tree and crop pests and human demands for wood products, healthy plants, fruits, seeds, and food, it is little wonder that pollinators and pesticides cross paths. When they do, problems can arise. As forestry activities are carried out, particularly plantation management, one may be unaware of the impacts on pollinators.

Beekeepers are the leaders in applying the services of pollination for human needs. Their concerns should be important to everyone because the impacts of pollination affect our food, fiber, and natural environments. An environment that is healthy for honeybees is likely to be healthy for most other pollinators, too. So, when beekeepers experience losses through pesticide poisoning and pesticide misuse, the public can almost be assured that the general environment has been stressed.

For beekeepers to avoid pesticide poisonings, and for pesticide users to help protect healthy ecosystems, cooperation and collaboration between growers and beekeepers are critical. Most insecticide labels carry warnings about toxicity and hazard to honeybees; however, much more research is needed to understand the effects on other pollinators, from "bugs" to birds. Pesticide applicators should adhere to the instructions on pesticide labels, not only because those instructions are regulations set in place by the government as laws, but also to ensure the health of the environment and of the applicator.

PRECAUTIONS: TIMING, COORDINATION, LOCATION

Bees, and many other pollinators, forage on blooming flowers from mid-morning to late afternoon when many flowers are high in nectar content; so pesticide applications made in the evening, early morning, or late in the day reduce the risk of poisoning many pollinators, except for night pollinators such as moths and bats. Beekeepers can work together with applicators by advising pesticide applicators and neighboring growers of the locations of their bee colonies and of the potential effects of pesticides on honey bees and other pollinators.

Beekeepers should take an active role in educating land owners and protecting their hives by leaving their contact information with growers and applicators, with additional information placed at their bee yards. Locating bee yards away from areas where pesticide sprays are likely is another way to help avoid accidental poisoning of colonies, although bees may forage up to 5 miles away from their hive locations. Beekeepers can take action when applications are planned by moving their bees away, temporarily closing the colonies, or covering the hives with wet burlap to confine and protect the bees while keeping them cool. Although those precautions seem sensible, they are often impractical. If landowners, foresters, pesticide users, and applicators understand this, they can find ways to help each other mitigate potential problems, thereby serving everyone's interests.

Photo by Kimberly Winter, NAPPC ©

Applicators should research the locations of hives to ensure that they are not endangering local bees. Furthermore, landowners and applicators should establish relationships with beekeepers to prevent problems before they arise. Working together, applicators and growers should alert beekeepers to forthcoming pesticide applications, and should consult with beekeepers to gauge the risks of applications to pollinators.

LEGAL RESPONSIBILITIES

Misuse of pesticides is an offense punishable by law. Nevertheless, interpretation of the law and circumstances surrounding pesticide use and pollinator mortalities can be unclear. In general, it is the responsibility of the landowner/lessor and pesticide applicator to take all reasonable precautions in order to not adversely affect neighbors.

Current law and precedent in Minnesota places the onus of responsibility for safe pesticide usage, in particular with respect to neighboring beekeepers, on the shoulders of the pesticide user. Thus, strict adherence to pesticide label instructions and precautions is required. To avoid problems and legal action, pesticide applicators must exercise due diligence when applying pesticides near bee yards and beekeepers' operations, and should encourage an appropriate exchange of information regarding both their activities and those of neighboring beekeepers.

WHAT YOU CAN DO TO PROMOTE HEALTHY TREES AND POLLINATORS IN MINNESOTA:

Use pesticides only when necessary and incorporate other non-chemical management practices when available. This practice is called "IPM," or Integrated Pest Management (see Online Resources for more IPM information.)

Follow label instructions for all pesticides, reading them carefully for any 'bee cautions' or 'warnings' (Insecticide labels do not include actual toxicity information)

- Pesticides are usually tested only on honeybees, if performed on any pollinator at all.
- Smaller, native bees may be more susceptible to pesticides, so caution is advised when considering "acceptable" levels of toxicity.

Pick appropriate chemical formulations.

- Dusts adhere to bees' hairy bodies and can be carried back to the hive, contaminating honey and posing a threat to the colony.
- Micro-encapsulated insecticides resemble pollen and can adversely affect the entire colony.
- Remember, stickers used in Extended Residual Toxicity pesticides applied to bloom can contaminate plant pollen.
- Choose non-ERT pesticides, if available.

Ensure that the pesticide(s) chosen will only affect the target species.

- Check "Koppert's Side Effects of Pesticides" www.koppert.nl/e0110.html
- Some pesticides have serious lethal and sub-lethal effects on pollinators.

Don't spray during parts of the day when pollinators are foraging, or when flowers are in bloom.

- Time pesticide applications for very early morning or more optimally, for very late in the day, when the wind is not blowing and conditions are dry and cool.

Schedule pesticide applications when flowers are not in bloom.

- Minimizing the negative effects of pesticide applications on non-target organisms increases their effectiveness and reduces risks to the environment.

Contact local beekeepers before spraying any pesticides.

- Beekeepers need to know when to protect or move their hives from chemical applications. They can also provide information about native flowers in bloom and general pollinator activity in the area.

Cultivate native plants that may provide nectar or larval food for pollinators.

- Attracting pollinators benefits the plants that need them for reproductive services, and the animals that eat pollinators and pollinated plant products.

Photo by Bill Johnson ©

ONLINE RESOURCES TO HELP

Forest Pest Management:

Minnesota Forest Pest Information,
Minnesota Department of Natural Resources:

www.dnr.state.mn.us/treecare/forest_health/index.html

Forest insect and disease information related directly to Minnesota's forests.

Forest Pests of North America,
Bugwood Network:

www.forestpests.org/

Comprehensive listing of insects, diseases, and other damage agents affecting forests in North America, plus links to publications and CD-ROMs.

Integrated Pest Management - Forest Pests,
U.S. National Park Service:

www.nps.gov/phso/ipm/forest.htm

List of forest pests and links to fact sheets specific to each.

Forest Pest Management,
Canada Department of Natural Resources:

www.gnb.ca/0078/fpm/involved.asp

Includes information on management, status of current pests, reports, and links to other sites.

Integrated Pest Management:

USDA-CREES Regional IPM Centers Information System,
NSF Center for Integrated Pest Management:

www.ipmcenters.org/producers/homepages/state.html

Great starter link to innumerable resources provided by state extension agencies and universities.

Center for Integrated Pest Management,
North Carolina State University:

http://cipm.ncsu.edu

Comprehensive and current web site funded by NSF as a focal point for information regarding IPM. Includes links to international, national, regional, and local databases and web sites. Downloadable presentations from 2003 IPM Symposium, including topics such as: urban IPM, education, vertebrate IPM, organic systems, and commodities are available at: http://cipm.ncsu.edu/symposium.

Photo by Umberto Moreno ©

Photo courtesy Thomas Maurer/USFWS

Pollinators:

Reducing Risks to Pollinators from Pesticides,
NAPPC:

http://nappc.org/PesticidesMain.html.

Online links to promote the protection of pollinators when addressing pest issues in urban and suburban settings, and for agriculture, rangelands, forests, and wetlands.

Pollinator Friendly Practices,
NAPPC and Wildlife Habitat Council:

http://nappc.org/PollinatorFriendlyPractices.pdf

Guidelines for creating pollinator habitat on corporate lands and home landscapes, appropriate for professional grounds keepers, landscapers, serious home gardeners, and land stewards. Successful applicants can win the North American Pollinator Protection Campaign-Wildlife Habitat Council's award for pollinator-friendly corporate lands.

Pollinators,
USDA Forest Service Celebrating Wildflowers:

www.fs.fed.us/wildflowers/pollinators/index.shtml

Comprehensive information about the diversity of pollinators, their relationships with native plants, and connection to the food web.

Recommendations for Minimizing Pesticide Impacts to Pollinators,
USFWS:
http://contaminants.fws.gov/issues/pollinators.cfm#Recommendations

Great resource with links to information about pollinators, listing of endangered species of pollinators, and specific ways to apply pesticides so as to reduce negative effects on them.

MORE **ONLINE RESOURCES TO HELP**

Photo by Bill Johnson ©

Tools for Pesticide Applicators:

Protecting Honey Bees from Pesticides,
Purdue University Cooperative Extension:

www.entm.purdue.edu/Entomology/ext/targets/e-series/EseriesPDF/E-53.pdf

Comprehensive listing of pesticides ranked by toxicity accompanied by good common-sense information and recommendations for growers and beekeepers. This site has a paragraph on communication and cooperation between growers, pesticide applicators, and beekeepers.

How to Reduce Bee Poisoning from Pesticides,
Washington State Extension:

http://cru.cahe.wsu.edu/CEPublications/pnw0518/pnw0518.pdf

This site provides comprehensive information for beekeepers and growers, in addition to pesticide lists based on residual toxicity.

Managing Insect Pests without Pesticides
University of Maine Cooperative Extension:

www.umext.maine.edu/onlinepubs/htmpubs/7150.htm

Information on numerous beneficial insects and spiders plus general advice on how to encourage "good bugs" and eliminate pests without the use of pesticides. Much of this information is applicable throughout North America.

Koppert's Side Effects of Pesticides on Natural Enemies and Bumblebees Calculator,
Koppert Biological Systems:

www.koppert.nl/e0110.html

Select a particular pesticide and a beneficial insect, and the calculator will produce information regarding the chemical's side effects, including persistence.

Environmental Protection Agency,
EPA:

http://epa.gov

United States EPA home page for information on regulations, laws, and current news regarding pesticides, water, air, soil, and toxins in the environment.

Beekeeping and Honey Production
Minnesota Department of Agriculture,

www.mda.state.mn.us/mgo/livestock/beekeeping.htm

MN DNR web links to information for beekeepers and growers looking for pollination services in the state.

Pesticide Fact Sheets,
USDA Forest Service:

www.fs.fed.us/foresthealth/pesticide/risk.shtml

Each fact sheet provides detailed information on forest and land management uses, environmental and human health effects, and safety precautions for various pesticides and their formulations, including product names. Toxicity data refers to the active ingredient. Pollinators and other wildlife are sometimes mentioned in section 4 "Ecological Effects."

Pesticide Safety & Environmental Education,
University of Minnesota Extension Service:

www.extension.umn.edu/pesticides/

Links to training events and pesticide informational web sites, including online regulations and resources.

Pesticide Applicator Training,
University of Wisconsin:

http://ipcm.wisc.edu/pat/other/index.htm

Provides online training manual and other links to pesticide safety.

Photo by Bill Johnson ©

TELL US WHAT YOU THINK!

Your feedback about this information will help us in our efforts to educate the public about pollinators and land management.
Please take just a few moments to answer the following questions:

Did you find the brochure helpful?

How could we make the information more useful?

Who would be the best audience for this material?

What else would you like to know about pollinators and natural resource management?

Other comments:

Some information about you:

Your name:

Email/phone contact:

Your interests, or what brought you to this web site (e.g., are you a land manager, farmer, gardener?):

Please fax this page to NAPPC at 415-362-3070 or send it via email to Laurie Adams at LDA@coevolution.org. The Coevolution Institute, a 501 (c) 3 nonprofit provides the administrative and fiscal management for NAPPC and works to protect biodiversity, including pollinators.

Reference Cited,
Jacobson, K. 2004.
Minnesota's Forest Resources.
Minnesota Department of Natural Resources, 500 Lafayette Rd,
St. Paul, MN 55155-4044. 72 p.

ABOUT THIS BROCHURE

The information and recommendations expressed in this brochure were produced in conjunction with the North American Pollinator Protection Campaign (NAPPC) and the Minnesota Department of Natural Resources. We wish to especially thank Dr. Peter Kevan and Mr. Jeff Anderson for their help in preparing this material.

The partners of the North American Pollinator Protection Campaign (NAPPC) represent a collaboration of more than one hundred agencies, government and non-government institutions, garden and grower groups, scientists, and other stakeholders involved in pollinator conservation in Canada, the United States, and Mexico. The opinions and recommendations expressed in this brochure have been reviewed by members of the NAPPC Steering Committee, but may not necessarily reflect the views of all NAPPC partners, partner institutions, or other affiliates.

For more information, contact:

Department of Natural Resources
500 Lafayette Road
St. Paul, MN 55155-4040
(651) 296-6157 (Metro Area)
1-888-MINNDNR (646-6367) (MN Toll Free)
www.dnr.state.mn.us