Putting Federal Pollinator Conservation Policies into Practice

Presented by Mace Vaughan
Pollinator Program Director, Xerces Society for Invertebrate Conservation
Joint Pollinator Conservation Specialist, USDA-NRCS WNTSC

Photo: Edward S. Ross

What is the Xerces Society?

The Xerces Society: A Nationwide Pollinator Extension Service

Collaborating with scientists, government agencies, cooperative extension, conservation groups and farmers

- Training and outreach
- Technical publications
- Technical support to the USDA-NRCS and partners
- Applied research
- Direct technical support to growers
- Develop new conservation tools
- Information for policymakers and media
- Document at-risk pollinators

Photo: Eric Mader

2008 Farm Bill: Brief Timeline

- **December 2006**: National Academy of Sciences Report
- **December 2006**: First cases of CCD discovered
- **Spring 2007**: Initial pollinator conservation legislation introduced

Photo: Edward S. Ross

2008 Farm Bill: Pollinator Research Provisions

New research programs

- Provides $10 million per year for the next 5 years (honey bee & native bee biology, CCD, bee ecology, toxicology, pathology)
- $7.25 million/year for the next 5 years to USDA-ARS (CCD, other pollinator threats)
- $2.75 million/year for the next 5 years to increase honey bee inspections

2008 Farm Bill: Pollinator Research Provisions

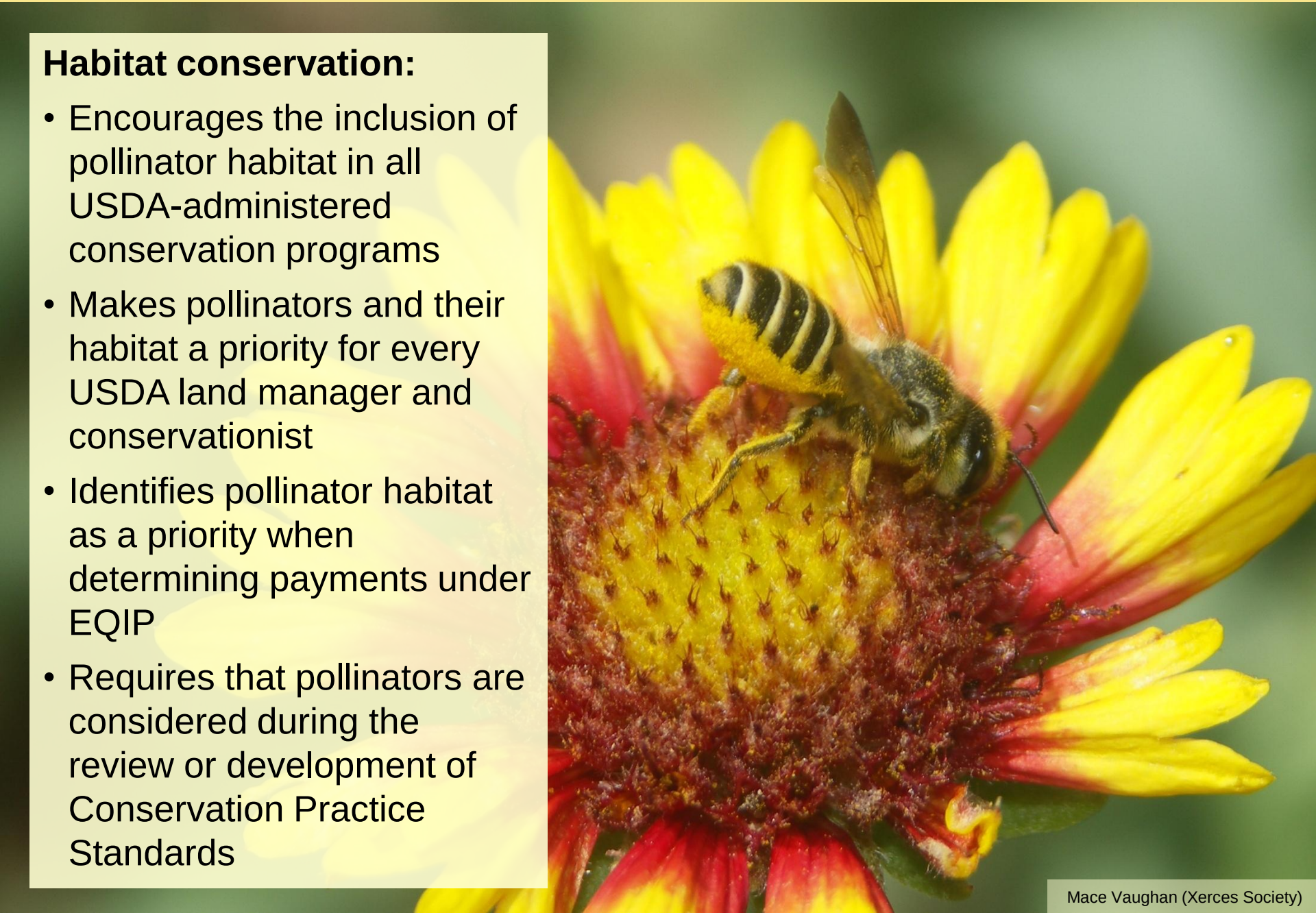
Existing research programs

- USDA Specialty Crop Research Initiative
- USDA Agriculture and Food Research Initiative

2008 Farm Bill: Pollinator Habitat Provisions

Habitat conservation:

- Encourages the inclusion of pollinator habitat in all USDA-administered conservation programs
- Makes pollinators and their habitat a priority for every USDA land manager and conservationist
- Identifies pollinator habitat as a priority when determining payments under EQIP
- Requires that pollinators are considered during the review or development of Conservation Practice Standards



Mace Vaughan (Xerces Society)

2008 Farm Bill Implementation

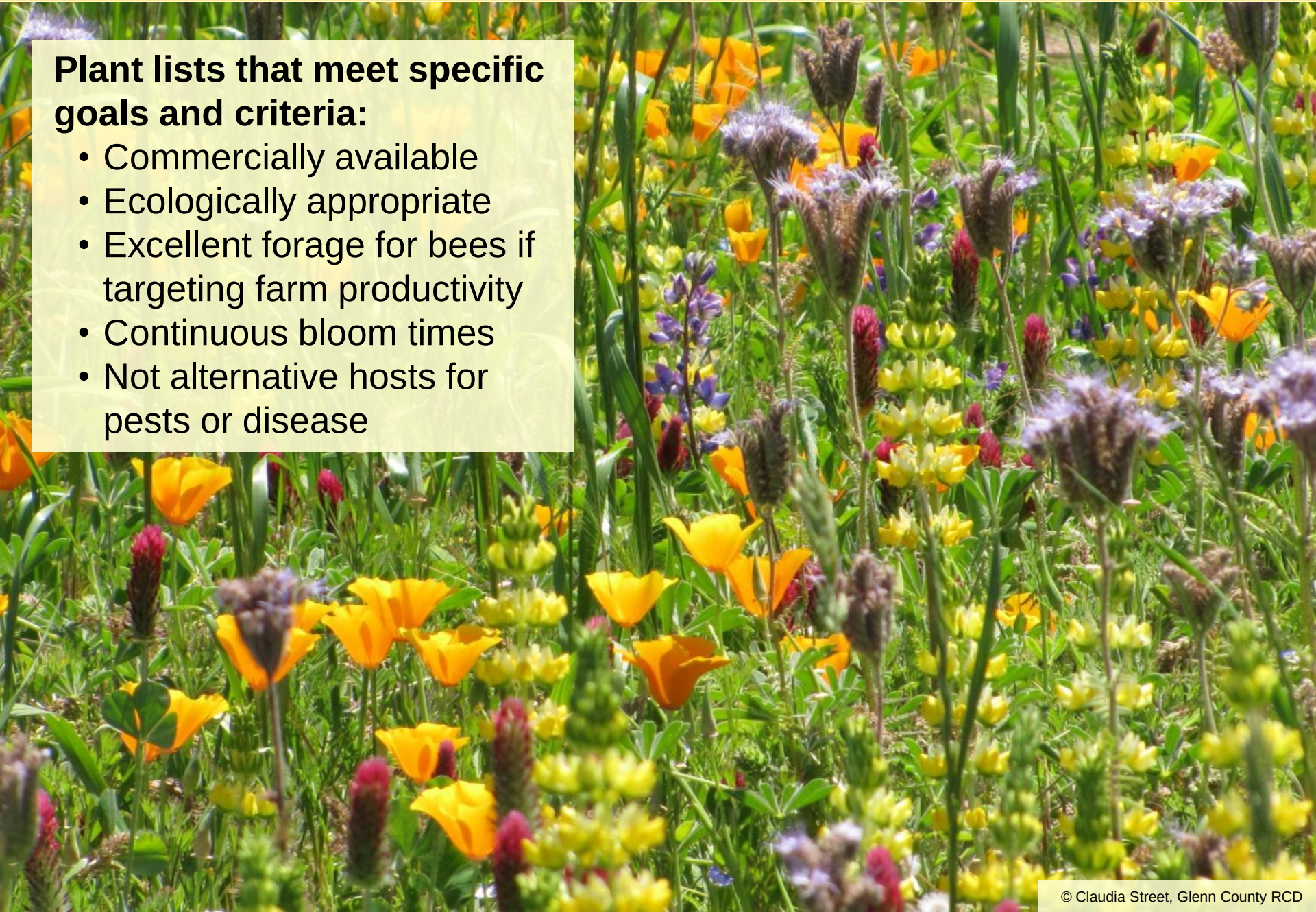
Farm Bill conservation programs: EQIP, WHIP, CSP, CRP, GRP…

Many NRCS Conservation Practices can create or manage habitat for pollinators:

- Conservation Cover
- Hedgerow Planting
- Field Border
- Restoration and Management of Rare or Declining Habitats
- Tree/Shrub Establishment
- Range Planting
- Upland Wildlife Habitat Management
- Pest Management
- Early Successional Habitat Development and Management

Sam Earnshaw, Community Alliance with Family Farmers

Challenges to Implementation: Plant Lists



Plant lists that meet specific goals and criteria:

- Commercially available
- Ecologically appropriate
- Excellent forage for bees if targeting farm productivity
- Continuous bloom times
- Not alternative hosts for pests or disease

Challenges: How to Establish Habitat

Establishment protocols that are not too expensive, but which work.

- Full growing season of site preparation and weed abatement
- Planting techniques that don't bring more weed seed to surface
- Follow up weed control during establishment

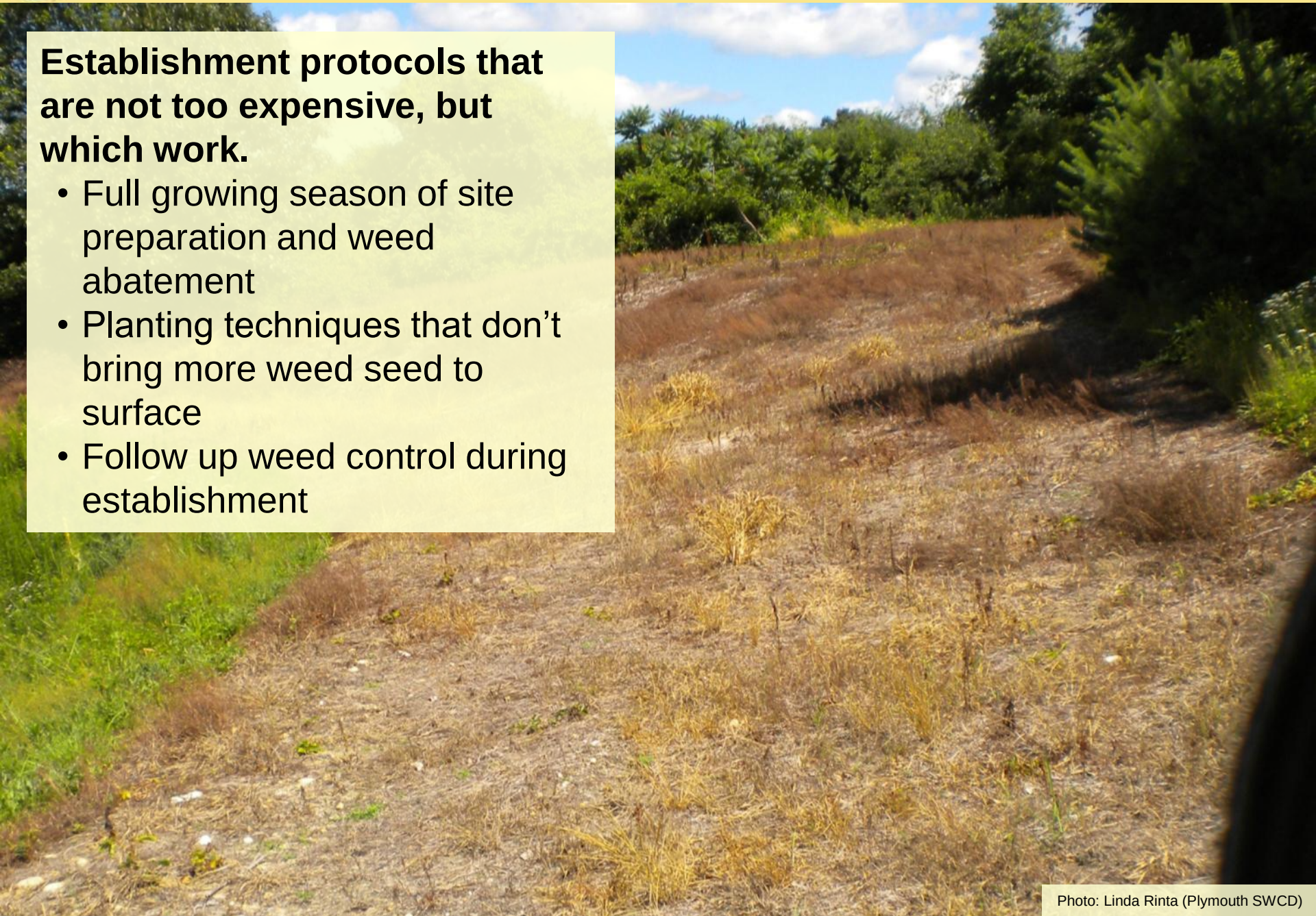


Photo: Linda Rinta (Plymouth SWCD)

Challenges: Practice Payment Scenarios

Practice payment scenarios that reflect the higher costs of:

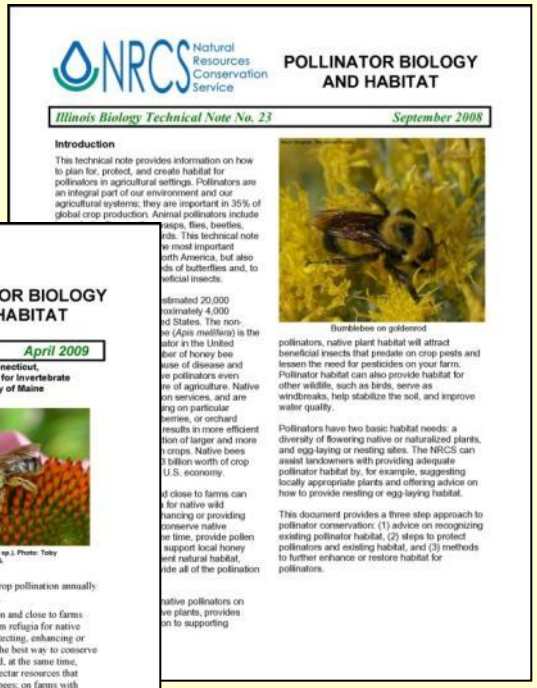
- Site preparation
- Native plant materials
- Weed control during establishment

Photo: Mace Vaughan (Xerces Society)

Challenges: Clear instructions for the field

Technical information to the field:

- Technical notes
- Plant lists
- JOB SHEETS


NRCS Natural Resources Conservation Service

POLLINATOR BIOLOGY AND HABITAT

Illinois Biology Technical Note No. 23 — *September 2008*

Introduction

This technical note provides information on how to plan for, protect, and create habitat for pollinators in agricultural settings. Pollinators are an integral part of our environment and our agricultural systems; they are important in 35% of global crop production. Animal pollinators include

...asps, flies, beetles, ...rds. This technical note ...e most important ...orth America, but also ...ds of butterflies and, to ...eficial insects.

...stimated 20,000 ...roximately 4,000 ...ed States. The non- ...e (*Apis mellifera*) is the ...ator in the United ...ber of honey bee ...use of disease and ...e pollinators even ...re of agriculture. Native ...on services, and are ...ing on particular ...berries, or orchard ...results in more efficient ...tion of larger and more ...h crops. Native bees ...3 billion worth of crop ...U.S. economy.

...d close to farms can ... for native wild ...hancing or providing ...conserve native ...e time, provide pollen ...support local honey ...ent natural habitat, ...ide all of the pollination

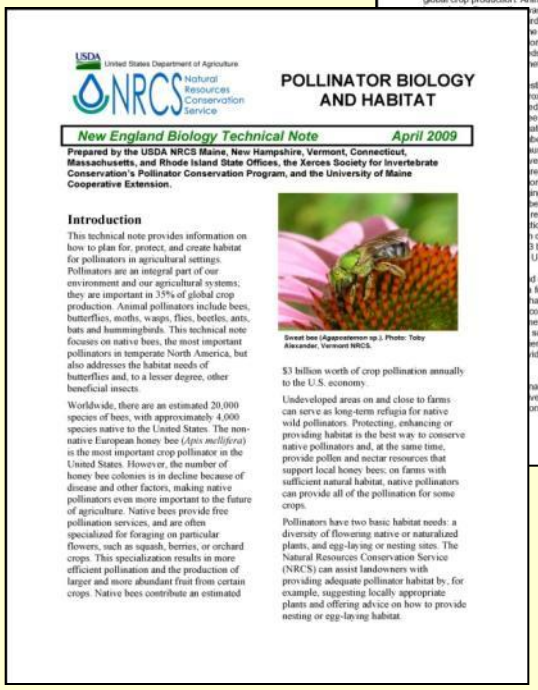
...native pollinators on ...e plants, provides ...on to supporting

Bumblebee on goldenrod

pollinators, native plant habitat will attract beneficial insects that predate on crop pests and lessen the need for pesticides on your farm. Pollinator habitat can also provide habitat for other wildlife, such as birds, serve as windbreaks, help stabilize the soil, and improve water quality.

Pollinators have two basic habitat needs: a diversity of flowering native or naturalized plants, and egg-laying or nesting sites. The NRCS can assist landowners with providing adequate pollinator habitat by, for example, suggesting locally appropriate plants and offering advice on how to provide nesting or egg-laying habitat.

This document provides a three step approach to pollinator conservation: (1) advice on recognizing existing pollinator habitat, (2) steps to protect pollinators and existing habitat, and (3) methods to further enhance or restore habitat for pollinators.


USDA United States Department of Agriculture

NRCS Natural Resources Conservation Service

POLLINATOR BIOLOGY AND HABITAT

New England Biology Technical Note — *April 2009*

Prepared by the USDA NRCS Maine, New Hampshire, Vermont, Connecticut, Massachusetts, and Rhode Island State Offices, the Xerces Society for Invertebrate Conservation's Pollinator Conservation Program, and the University of Maine Cooperative Extension.

Introduction

This technical note provides information on how to plan for, protect, and create habitat for pollinators in agricultural settings. Pollinators are an integral part of our environment and our agricultural systems; they are important in 35% of global crop production. Animal pollinators include bees, butterflies, moths, wasps, flies, beetles, ants, bats and hummingbirds. This technical note focuses on native bees, the most important pollinators in temperate North America, but also addresses the habitat needs of butterflies and, to a lesser degree, other beneficial insects.

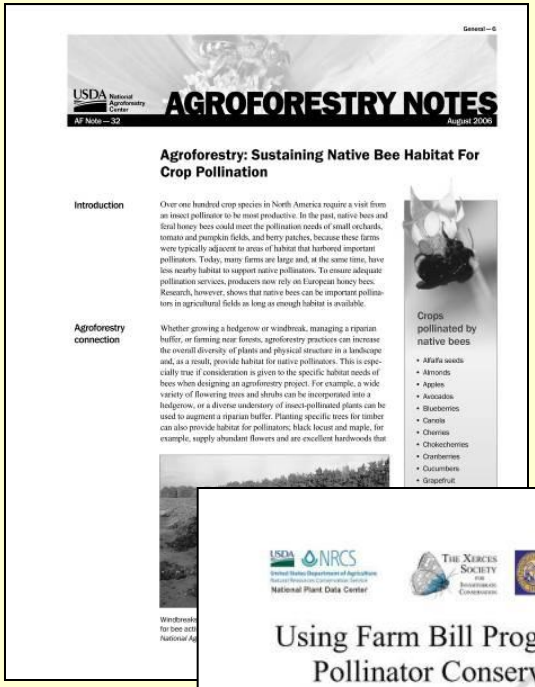
Worldwide, there are an estimated 20,000 species of bees, with approximately 4,000 species native to the United States. The non-native European honey bee (*Apis mellifera*) is the most important crop pollinator in the United States. However, the number of honey bee colonies is in decline because of disease and other factors, making native pollinators even more important to the future of agriculture. Native bees provide free pollination services, and are often specialized for foraging on particular flowers, such as squash, berries, or orchard crops. This specialization results in more efficient pollination and the production of larger and more abundant fruit from certain crops. Native bees contribute an estimated

Sweat bee (*Agapostemon* sp.). Photo: Toby Alexander, Vermont NRCS.

$3 billion worth of crop pollination annually to the U.S. economy.

Undeveloped areas on and close to farms can serve as long-term refugia for native wild pollinators. Protecting, enhancing or providing habitat is the best way to conserve native pollinators and, at the same time, provide pollen and nectar resources that support local honey bees; on farms with sufficient natural habitat, native pollinators can provide all of the pollination for some crops.

Pollinators have two basic habitat needs: a diversity of flowering native or naturalized plants, and egg-laying or nesting sites. The Natural Resources Conservation Service (NRCS) can assist landowners with providing adequate pollinator habitat by, for example, suggesting locally appropriate plants and offering advice on how to provide nesting or egg-laying habitat.


USDA National Agroforestry Center

AGROFORESTRY NOTES

AF Note—32 — August 2006

Agroforestry: Sustaining Native Bee Habitat For Crop Pollination

Introduction

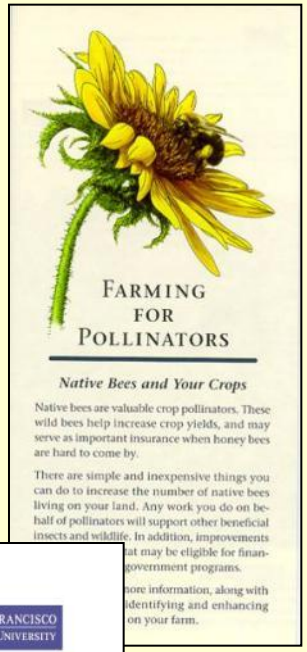
Over one hundred crop species in North America require a visit from an insect pollinator to be most productive. In the past, native bees and feral honey bees could meet the pollination needs of small orchards, tomato and pumpkin fields, and berry patches, because these farms were typically adjacent to areas of habitat that harbored important pollinators. Today, many farms are large and, at the same time, have less nearby habitat to support native pollinators. To ensure adequate pollination services, producers now rely on European honey bees. Research, however, shows that native bees can be important pollinators in agricultural fields as long as enough habitat is available.

Agroforestry connection

Whether growing a hedgerow or windbreak, managing a riparian buffer, or farming near forests, agroforestry practices can increase the overall diversity of plants and physical structure in a landscape and, as a result, provide habitat for native pollinators. This is especially true if consideration is given to the specific habitat needs of bees when designing an agroforestry project. For example, a wide variety of flowering trees and shrubs can be incorporated into a hedgerow, or a diverse understory of insect-pollinated plants can be used to augment a riparian buffer. Planting specific trees for timber can also provide habitat for pollinators; black locust and maple, for example, supply abundant flowers and are excellent hardwoods that

Crops pollinated by native bees

- Alfalfa seeds
- Almonds
- Apples
- Avocados
- Blueberries
- Canola
- Cherries
- Chokecherries
- Cranberries
- Cucumbers
- Grapefruit



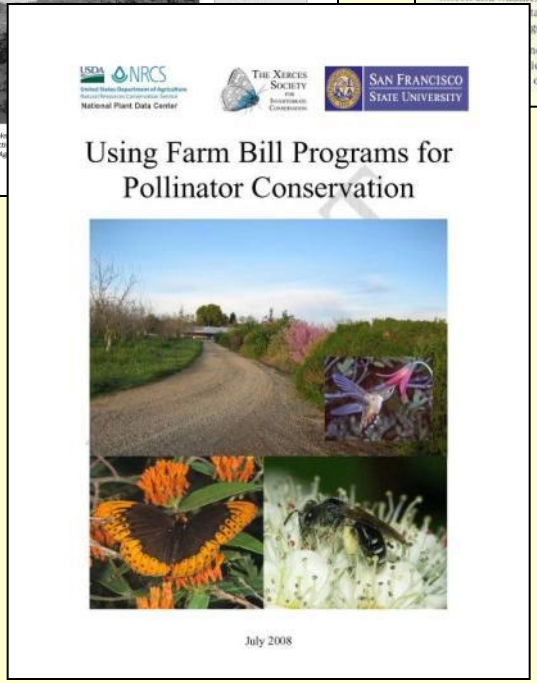
FARMING FOR POLLINATORS

Native Bees and Your Crops

Native bees are valuable crop pollinators. These wild bees help increase crop yields, and may serve as important insurance when honey bees are hard to come by.

There are simple and inexpensive things you can do to increase the number of native bees living on your land. Any work you do on behalf of pollinators will support other beneficial insects and wildlife. In addition, improvements ...at may be eligible for finan- ...government programs.

...ore information, along with ...identifying and enhancing ...on your farm.


USDA NRCS National Plant Data Center

The Xerces Society for Invertebrate Conservation

San Francisco State University

Using Farm Bill Programs for Pollinator Conservation

July 2008

Photo: Eric Mader (Xerces Society)

Challenges: Getting Know-How to the Field

Field trainings on how to:

- Design and implement pollinator projects
- Assess habitat and conduct farm planning to minimize impacts to pollinators

Bob Hammond (Colorado State University)

Challenges: Getting Know-How to the Field

Field trainings on how to:

- Design and implement pollinator projects
- Assess habitat and conduct farm planning to minimize impacts to pollinators

SARE Sustainable Agriculture Research & Education

NRCS Natural Resources Conservation Service

Bob Hammond (Colorado State University)

Xerces Society's Collaborations

We collaborate closely with the NRCS and other partners to build capacity across the country to take full advantage of the potential in the farm bill.

National Partnership: USDA-NRCS

Xerces' technical support to NRCS

- Promote NRCS and Conservation Programs
- National Technology Support Centers (Contribution Agreement)
  - Webinars and national on-line training development
  - Ongoing support to states: plant list review, habitat evaluation guides, demonstrations, trainings
  - Conservation practice review
  - Ongoing support to national Pest Management team
- National Plant Material Program and PLANTS Database
  - Plant list review
  - Demonstrations and research

Regional Partnerships: New England

New England

- Creation of an NRCS/Xerces Society workgroup

Photo: Don Keirstead, NRCS

Regional Partnerships: New England

New Hampshire
- Pilot projects with NRCS & UNH Extension
- Extensive restoration with major wild blueberry & apple farms

Maine
- Developing multiple bee pastures adjacent to apples and cranberries

Massachusetts
- Bumble bee habitat creation with Cape Cod Cranberry Growers Association and Plymouth SWCD
- Wildflower restoration with land trusts and farms

Photo: Don Keirstead, NRCS

Regional Partnerships: Upper Midwest

Joint Staff Positions

- University of Minnesota Extension
- UW Center for Integrated Ag Systems

Demonstration Projects

- NRCS Plant Materials Center, Rose Lake, MI
- University of Wisconsin Arboretum

Habitat Restoration

- Apple, cranberry, vegetable farms across Wisconsin and Minnesota

Minnesota and Wisconsin Pollinator Conservation Workgroup

- USDA-NRCS, State departments of agriculture and natural resources, Midwest Organic and Sustainable Education Service, Organic Tree Fruit Association, Minnesota Fruit and Vegetable Growers Association
- MN DNR Roadsides for Wildlife Initiative
- UW native bee research in apple orchards

Photos: Jennifer Hopwood

Regional Partnerships: Pacific Northwest

Plant Establishment Research

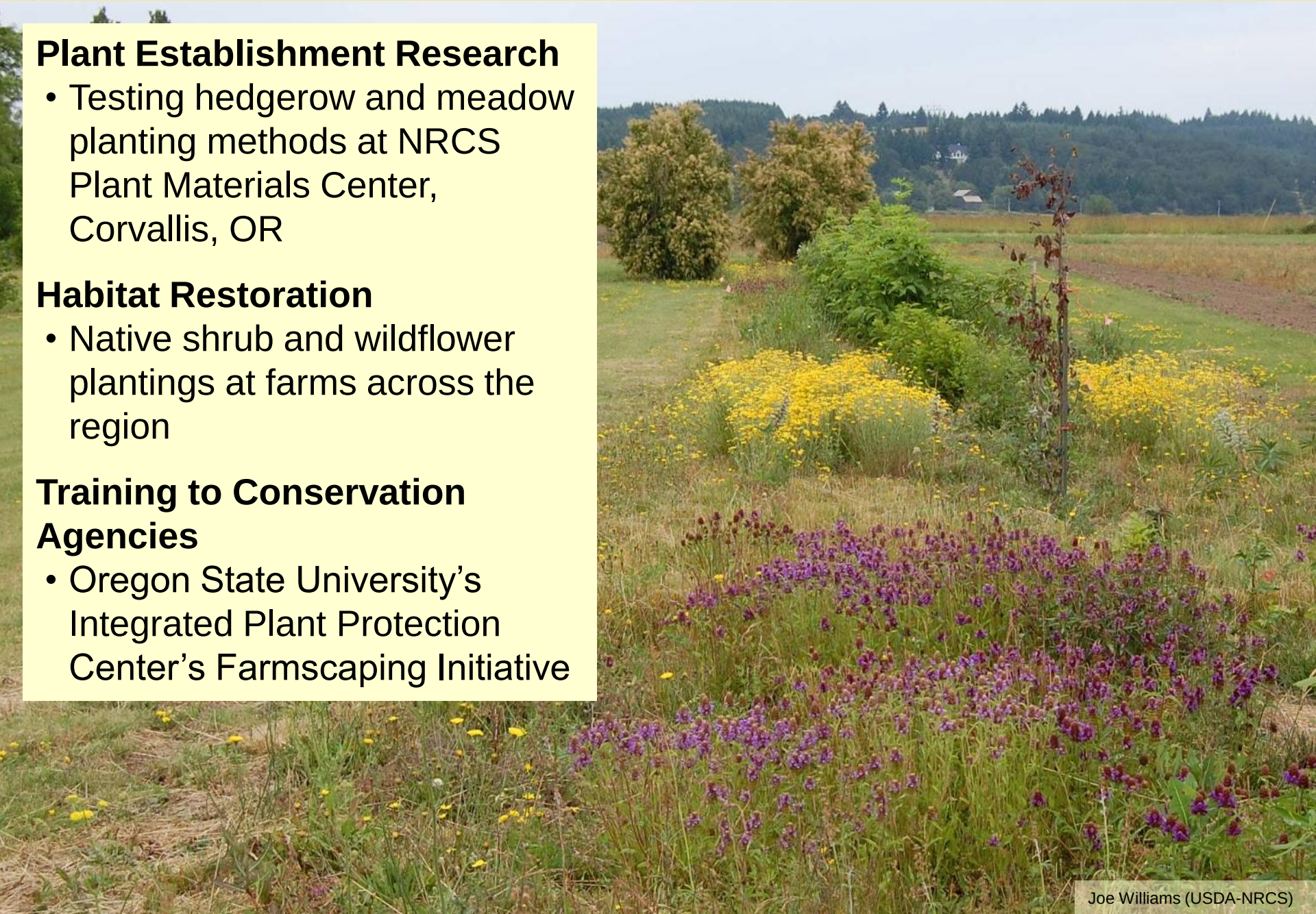
- Testing hedgerow and meadow planting methods at NRCS Plant Materials Center, Corvallis, OR

Habitat Restoration

- Native shrub and wildflower plantings at farms across the region

Training to Conservation Agencies

- Oregon State University's Integrated Plant Protection Center's Farmscaping Initiative



Joe Williams (USDA-NRCS)

Regional Partnerships: California

NRCS Pollinator WHIP Initiative

- One-third of 2009 WHIP budget ($300,000) dedicated to pollinators
- 57 miles of native shrub hedgerows established
- Over 1000 acres of native plant restoration

Research and Demonstration Projects

- Flowering hedgerows and range-land plantings in 6 regions of the state
- Effectiveness monitoring with UC Berkeley and UC Davis

Monarch Butterfly Conservation

- Overwintering sites
- Native milkweed restoration

Regional Partnerships: California

NRCS Pollinator WHIP Initiative

- One-third of 2009 WHIP budget ($300,000) dedicated to pollinators
- 57 miles of native shrub hedgerows established
- Over 1000 acres of native plant restoration

Research and Demonstration Projects

- Flowering hedgerows and range-land plantings in 6 regions of the state
- Effectiveness monitoring with UC Berkeley and UC Davis

Monarch Butterfly Conservation

- Overwintering sites
- Native milkweed restoration

Partners for Sustainable Pollination

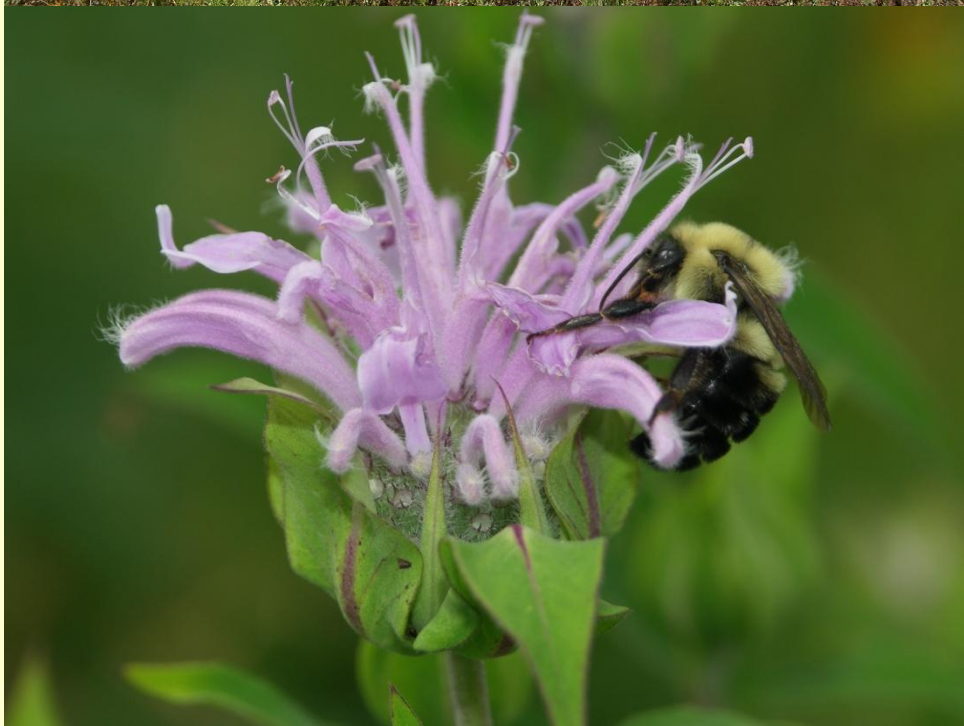
Regional Partnerships: Pennsylvannia

Technical Support to USDA-NRCS

- Refining wildflower planting guidelines
- 100 acres of Conservation Stewardship Program land contracted for 2010 (100+ acres of already established)

Penn State Partnership

- Demonstration sites
- Testing planting technology
- Monitoring bee visitation to restoration sites
- Developing pesticide reduction strategies
- Master Gardener citizen-scientist monitoring protocol



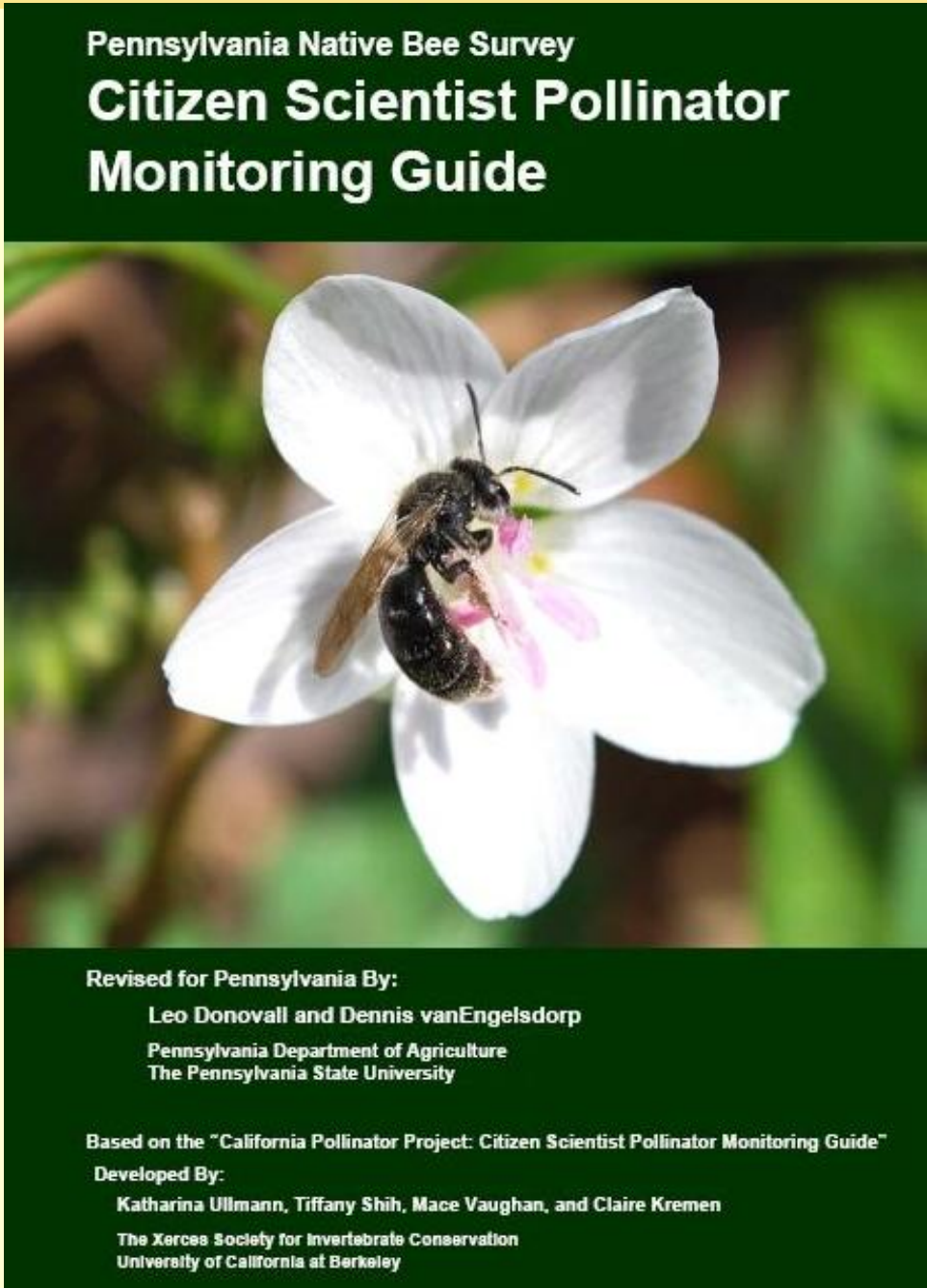
Regional Partnerships: Pennsylvannia

Technical Support to USDA-NRCS

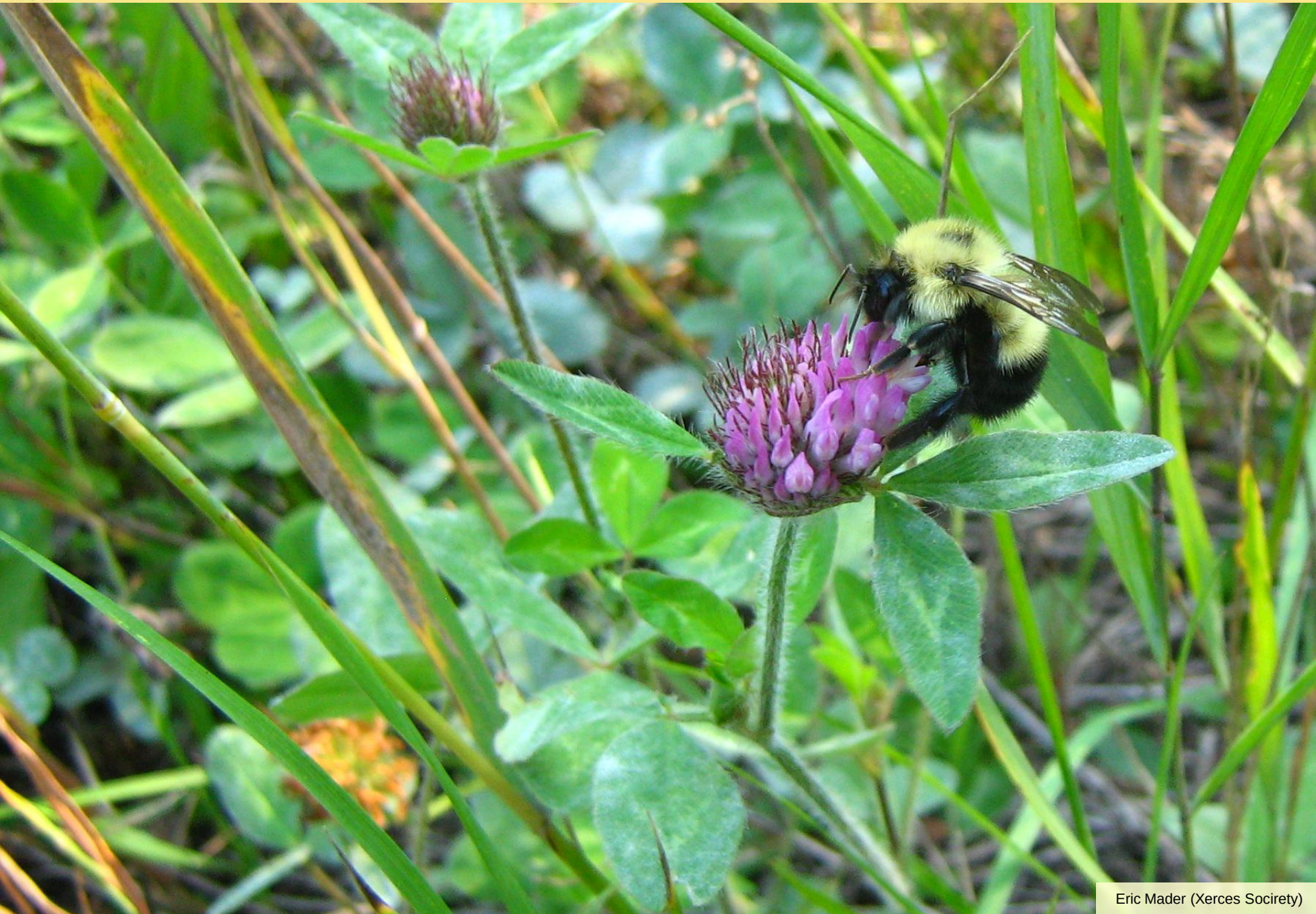
- Refining wildflower planting guidelines
- 100 acres of Conservation Stewardship Program land contracted for 2010 (100+ acres of already established)

Penn State Partnership

- Demonstration sites
- Testing planting technology
- Monitoring bee visitation to restoration sites
- Developing pesticide reduction strategies
- Master Gardener citizen-scientist monitoring protocol



What's old is what's new?



Eric Mader (Xerces Socirety)

What's old is what's new?

GROW MORE LEGUME SEED
With Pollinating Insects

Those busy bees you see in legume fields on warm summer days are doing much more than making honey. They are making money for the farmer who harvests legume seed.

Legume seed yields generally have been reduced to about one-fourth of what they once were. Lack of pollinating insects is the main reason. Tests show that you can increase seed yields 3 to 15 times if you have enough bees.

Legume seeds are badly needed for meadow seedings in soil-conserving crop rotations and pasture improvement. All of the following legumes are greatly benefited by insect pollination:

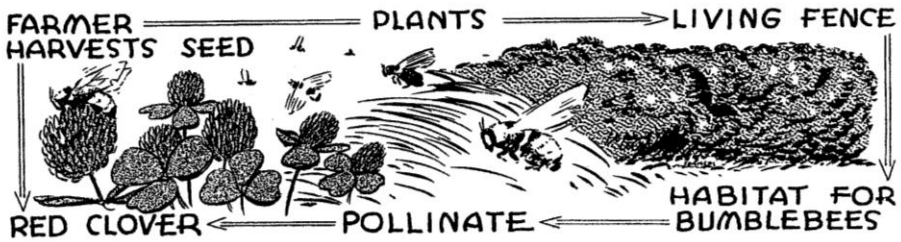
Alfalfa	Ladino clover	Sweetclover	Birdsfoot trefoil
Alsike clover	Red clover	White clover	Hairy vetch

WILD BEES ARE GOOD POLLINATORS

Years ago wild bees did most of the pollinating. But intensive cropping, cleaning up of fence rows, and uncontrolled burning have destroyed their homes and greatly reduced their number. Wild bees are the most efficient pollinators, especially for alfalfa.

You can increase the number of wild bees on your farm by protecting the following kinds of land from grazing and burning:

Drainage ditch banks	Pond areas
Fence rows	Shelterbelts and windbreaks
Field borders	Streambanks
Odd areas	Wood lots



UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service, Upper Mississippi Region, Milwaukee, Wis.

PA–126

Issued June 1950

What's old is what's new?

GROW MORE LEGUME SEED
With Pollinating Insects

Those busy bees y
summer days are d
honey. They are ma
harvests legume seed

Legume seed yield
to about one-fourth
of pollinating insec
show that you can in
if you have enough b

Legume seeds are badly needed for mea
ture improvement. All of the following leg

Alfalfa
Alsike clover
Ladino clover
Red clover

WILD BEES ARE

Years ago wild bees did most of the pol
rows, and uncontrolled burning have destr
Wild bees are the most efficient pollinators,

You can increase the number of wild be
land from grazing and burning:

Drainage ditch banks
Fence rows
Field borders
Odd areas

UNITED STATES DEP
Soil Conservation Service, Upp

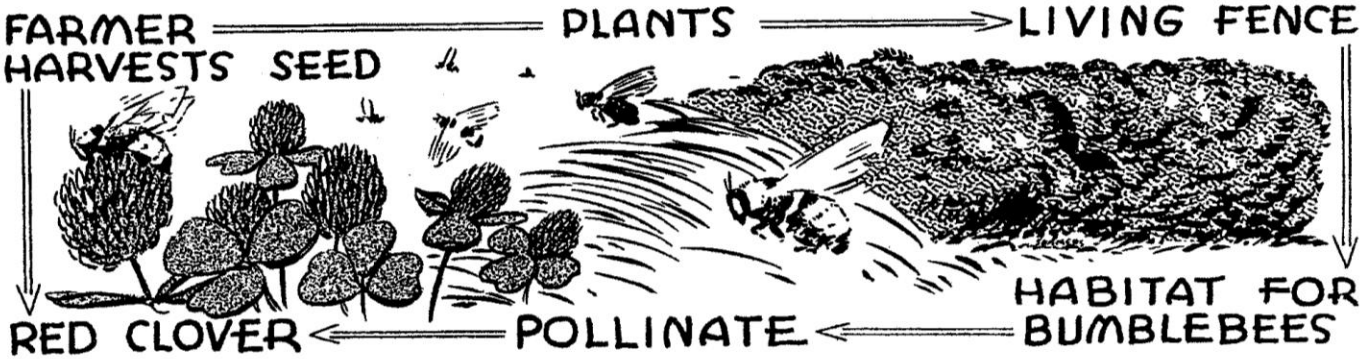
PA–126

WILD BEES ARE GOOD POLLINATORS

Years ago wild bees did most of the pollinating. But intensive cropping, cleaning up of fence rows, and uncontrolled burning have destroyed their homes and greatly reduced their number. Wild bees are the most efficient pollinators, especially for alfalfa.

You can increase the number of wild bees on your farm by protecting the following kinds of land from grazing and burning:

Drainage ditch banks
Fence rows
Field borders
Odd areas
Pond areas
Shelterbelts and windbreaks
Streambanks
Wood lots



UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service, Upper Mississippi Region, Milwaukee, Wis.

PA–126

Issued June 1950

Further Information: The Xerces Society

New Pollinator Conservation Resource Center

Region-specific information from Extension, NRCS, NGO, and other sources, including:

- Plant Lists
- Nest Construction Guidelines
- Conservation Guidelines
- Pesticide Guidelines
- Sources of Plant Materials

www.xerces.org/pollinator-resource-center

A collaboration with Neal Williams (UC Davis) and NE SARE

Thank you

Penn State CPR, and the many excellent scientists, conservationists, and farmers

Financial support from

- Xerces Society Members
- NRCS: West National Tech Center, CA State, Ag Wildlife Conservation Center
- USDA-SARE
- Turner Foundation
- CS Fund
- Disney Wildlife Conservation Fund
- Richard and Rhoda Goldman Foundation
- Ceres Foundation
- Panta Rhea Foundation
- Gaia Fund
- Bill Healy Foundation
- Bradshaw-Knight Foundation
- Wildwood Foundation
- Organic Farming Research Foundation
- Organic Valley
- Dudley Foundation
- Bullitt Foundation

Photo: Mace Vaughan