



Pollinators + Agriculture

www.beefriendlyfarming.org
miles@pollinator.org

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Talk Outline:

- 1) Pollinators and Agriculture
- 2) Habitat Examples
- 3) Bee Friendly Farming
- 4) Resources



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Pollinators and Agriculture

Honeybees pollinate \$15 billion worth of crops in the United States each year, including more than 130 types of fruits, nuts, and vegetables (USDA).

Over 1200 types of crops require pollination, and pollinators contribute an estimated \$217 billion to the global economy (CDFW).



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Issues in Agriculture



Examples of Pollinator Habitat

Cover Crops in Adjacent Land or Field Edge



Cover Crops within Field



Examples of Pollinator Habitat

Hedgerows Along Orchard Edge



Natural Habitat Areas



Examples of Pollinator Habitat

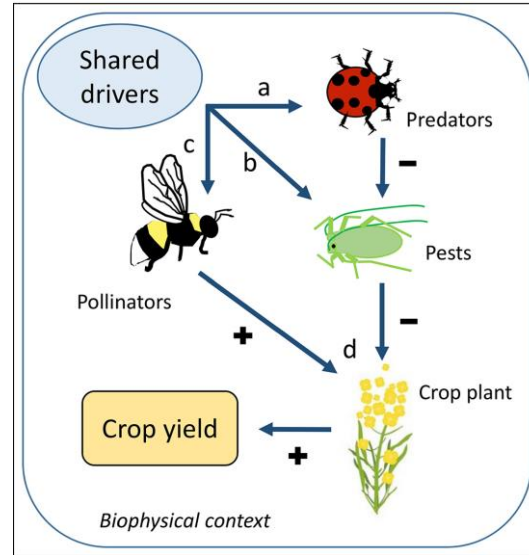
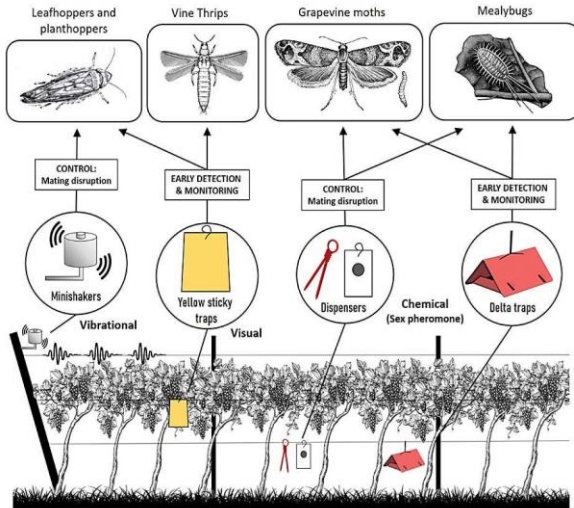
Set Aside Plantings



Examples of Pollinator Habitat

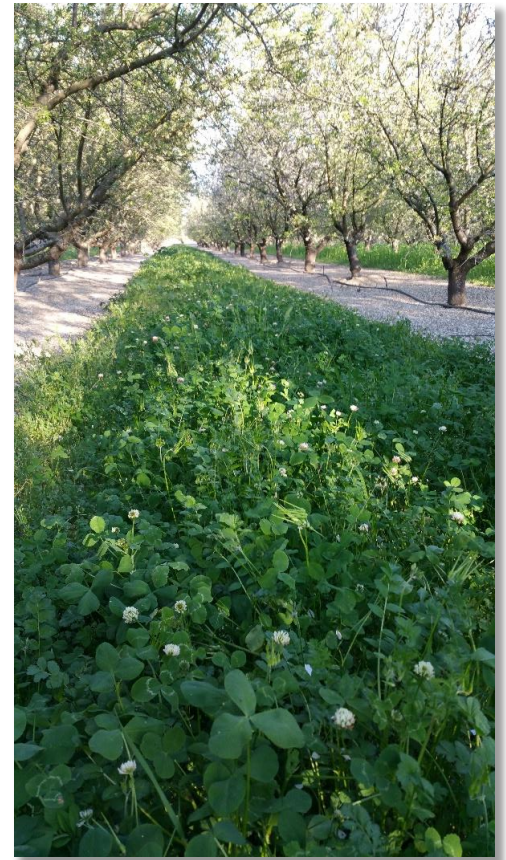


IPM



Lundin et al 2021

1% organic matter =
19,000 gallons per
acre of water
holding capacity!

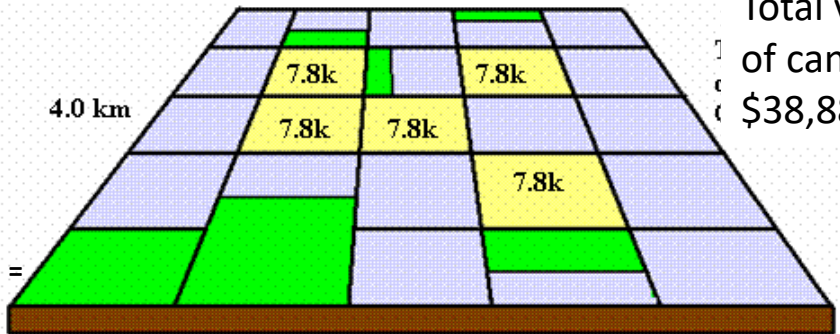


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Credit: Rory Crowley

4.0km



Total value
of canola
\$38,880

1400kg/ha \$0.31/ kg =
\$434 / ha

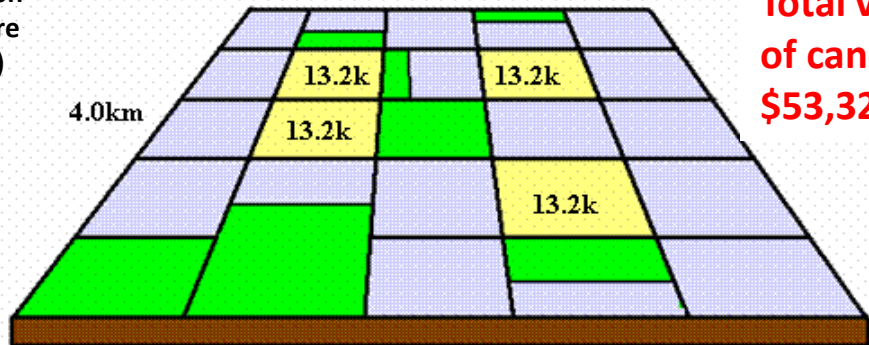
\$27 776 / quarter section

~\$7800 profit

Increase quarter section
uncultivated = 3.5 more
seeds/pod (18 to 21.5)

\$13 331 / section

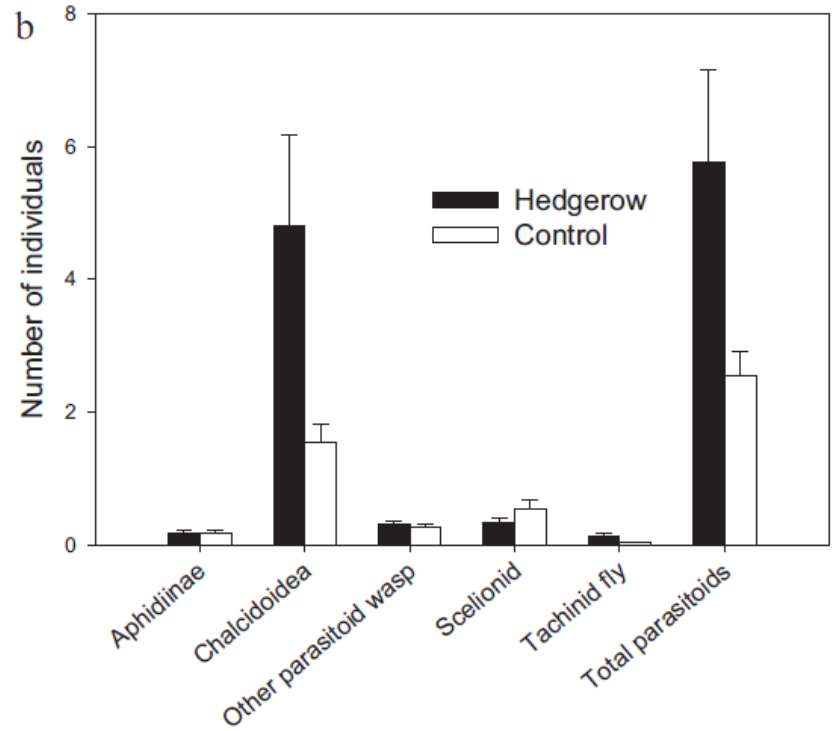
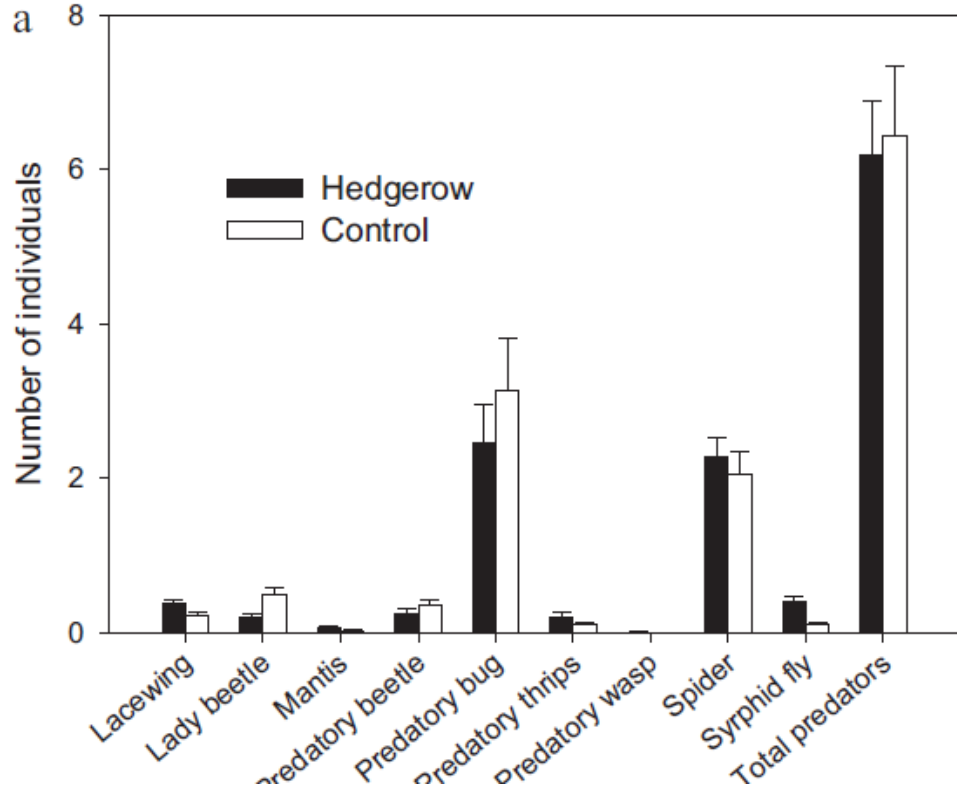
4.0 km



Total value
of canola
\$53,324

Morandin and
Winston, 2005,
Agriculture,
Ecosystems &
Environment

Beneficials



Habitat Benefits

Habitat for Beneficial Insects & Integrated Pest Management (IPM)

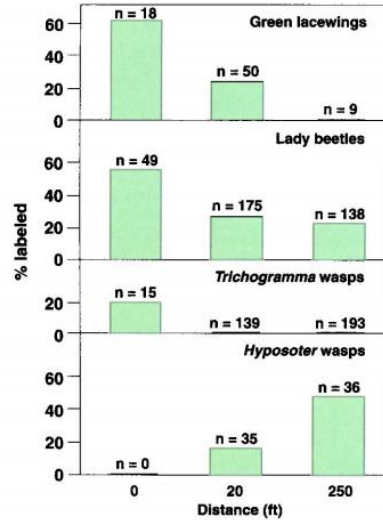


Fig. 1. Percent Rb-labeled beneficial insects in the insectary hedgerow (0 ft) and in the adjacent vegetable crop at 20 ft and 250 ft (n = total number of insects captured).

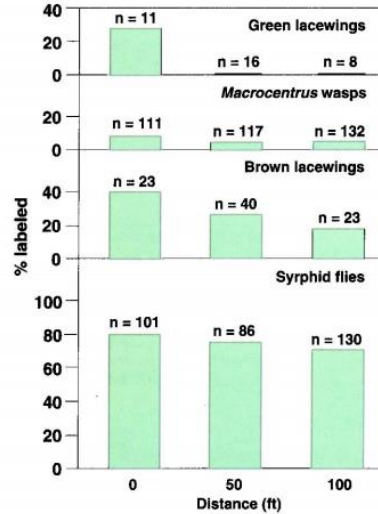


Fig. 2. Percent Rb-labeled beneficial insects trapped in the almond trees at 0, 50 and 100 ft from the Rb-labeled insectary cover crop mix (n = total number of insects captured).

Efficient Pollination



1 ACRE

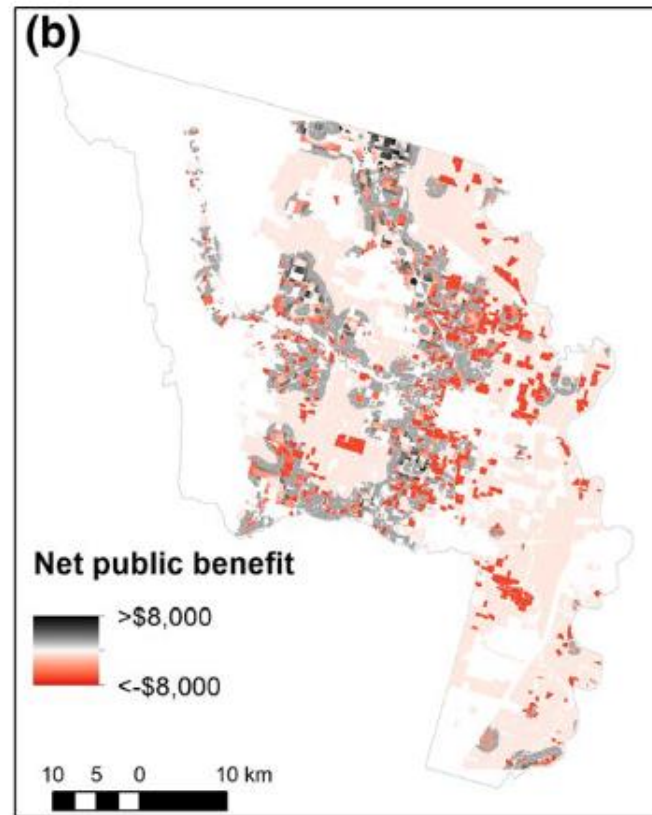
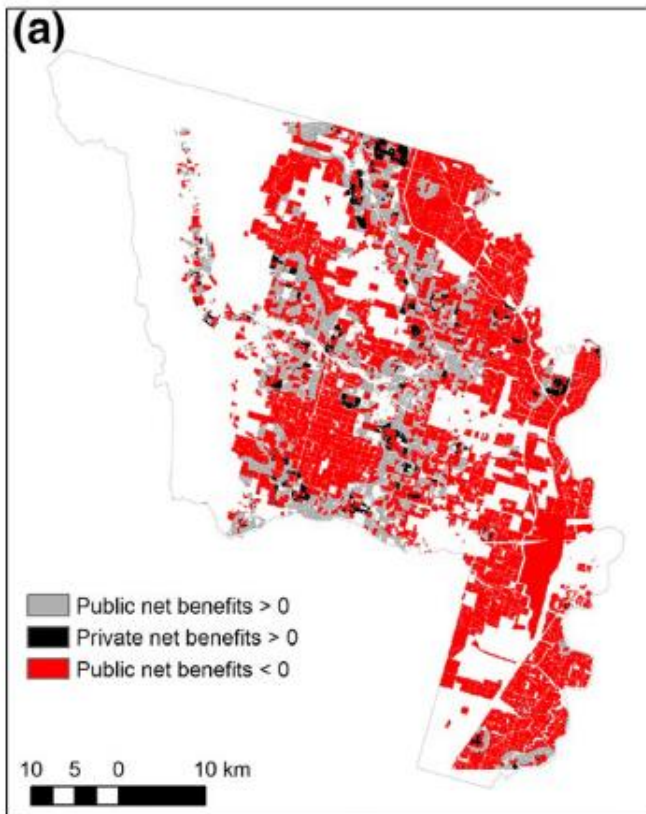


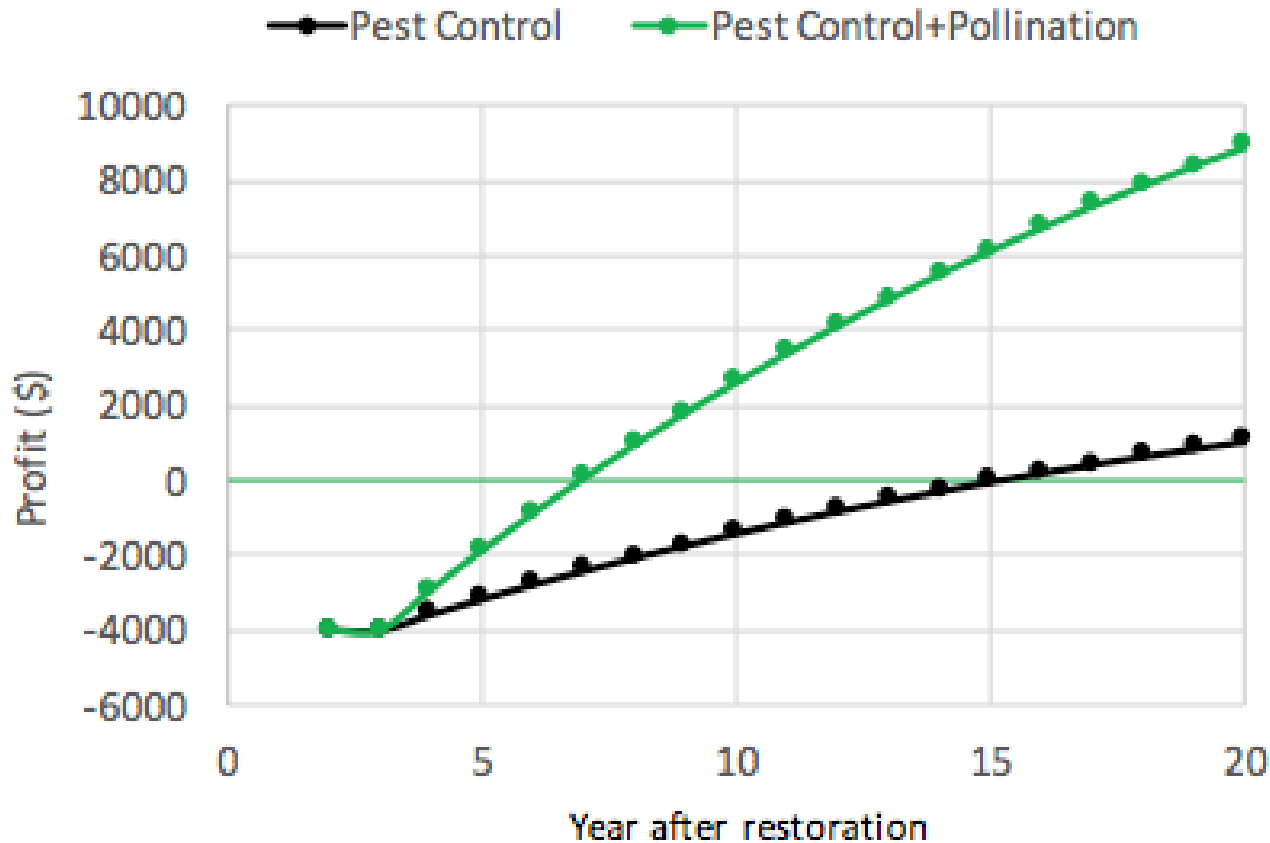
HONEYBEES

NATIVE BEES



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$$P_P = MV \times Y \times PI$$

$$P_{PC} = \sum_{S=1}^n (W_S - H_S) C_S$$

$$B_Y = \left\{ \sum_{Y=4}^Y \left[\frac{(P_P + P_{PC})}{1.05^Y} \right] \right\} - C$$



Orchard Hedgerows for Pest Control & Pollination



https://www.wildfarmalliance.org/video_library



Bee Friendly Farming

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What is Bee Friendly Farming

Bee Friendly Farming Certified (BFF) is a second-party-verified certification program from the 501 (c) 3, award-winning nonprofit Pollinator Partnership, whose 25 year history has allowed it to grow into the largest non-profit focused exclusively on pollinator issues in the world.



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BFF IN 2023

2023 was monumental for Bee Friendly Farming. BFF can help farmers incorporate affordable, simple, science-based guidelines, like offering habitat for bees and integrating pest management strategies.



436
Farms
Added



118,436
Total Farm
Acres
Added



24,230
Habitat
Acres
Added

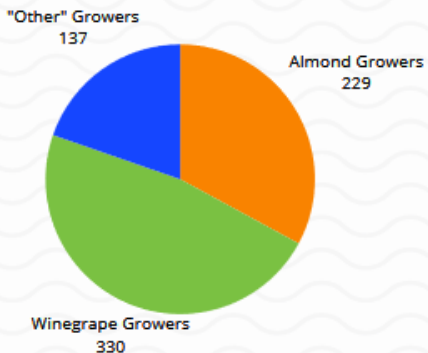
TOTAL BFF ACREAGE

375,036 Total Farm Acres
89,618 Total Habitat Acres

- 71,128 Almond Habitat Acres
- 9,388 Winegrape Habitat Acres
- 9,102 "Other" Habitat Acres

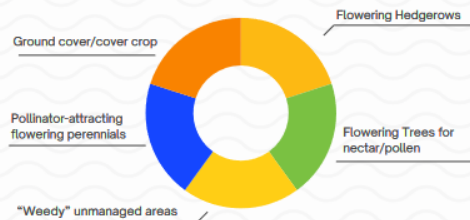
BFF PRODUCERS

696 Total Number of BFF Growers!



FORAGE FOR POLLINATORS

BFF growers are implementing significant forage practices on their farm. The following shows the top 5 practices being implemented today:



BEE FRIENDLY FARMING EXPANSION

BFF continues to expand across the U.S. and in Canada. We thank our growers for their efforts to protect, preserve, and promote pollinator health. You can implement positive, incremental changes on your property and be an essential part of keeping our pollinators healthy and food supply abundant. Join Hundreds of other members by applying today.

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BFF Certified Criteria

1. Offer forage providing good nutrition for bees on at least 3% of land. Forage can be temporary, including cover crops.
2. Provide bloom of different flowering plants throughout the growing season, especially in early spring and late autumn.
3. Offer clean water for bees if not inhibited by government mandated water restrictions.
4. Provide permanent habitat for nesting through features such as hedgerows, natural brush, buffer strips, or bare ground.
5. Practice Integrated Pest Management (IPM); reduce or eliminate the use of chemicals.
6. Pay annual certification and 3-year compliance



How does this benefit you?



These practices provide numerous agronomic, ecological, and social benefits

- Habitat and cover crops improve soil health, water retention, and carbon sequestration
- IPM reduces inputs and pest pressure
- Meet sustainability requirements from buyers
- Be a part of the industry wide movement
- Buyers can use the BFF Logo on packaging and marketing material

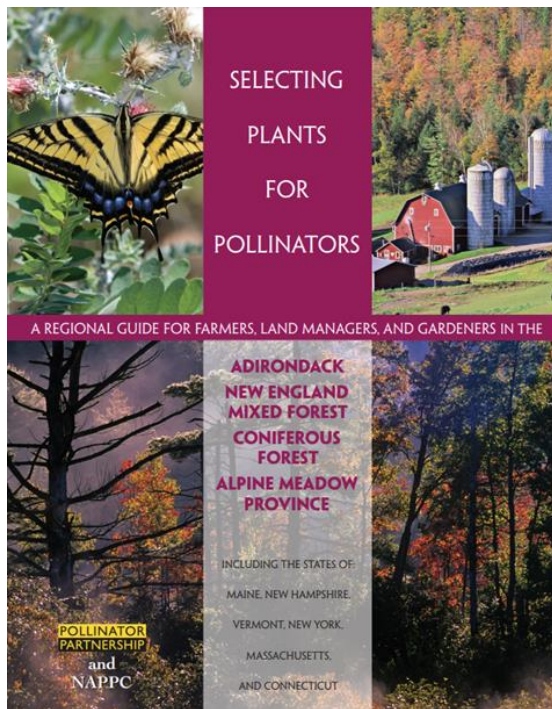


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Resources Available

Ecoregional Planting Guides

<https://www.pollinator.org/guides>



Botanical Name	Common Name	Color	Height	Flower Season	Sun	Soil	Visitation by Pollinator
Trees & Shrubs							
<i>Fallugia paradoxa</i>	Apache plume	white	3-6'	Apr-Oct	full sun	gravelly alluvium	bees, flies, butterflies, moths
<i>Fendlera rupicola</i>	cliff fendlerbush	white	3-6'	Apr-Oct	full sun	rocky	bees, flies, butterflies, moths
<i>Dasiphora fruticosa</i> ssp. <i>floribunda</i>	shrubby cinquefoil	yellow	2-4'	Jun-Jul	full sun	clay to sandy loam	bees, flies, butterflies
<i>Prunus virginiana</i>	chokecherry	white	6-30'	May-Jun	full sun to partial shade	various	bees, flies, butterflies
<i>Robinia neomexicana</i>	New Mexico locust	rose-pink	10-30'	Apr-Jul	full sun to full shade	clay to sandy loam	bees, bumblebees
<i>Rosa woodsii</i>	Woods' rose	rose-pink	2-3'	Jun-Aug	full sun to full shade	clay loam to sandy loam	bees, flies, butterflies
Perennial Flowers							
<i>Achillea millefolium</i>	common yarrow	white	6-12"	May-Aug	full sun	various	bees, flies, butterflies, moths
<i>Agastache pallidiflora</i>	Bill Williams Mountain giant hyssop	white to deep rose-purple	12-30"	Jul-Oct	partial to full shade	loamy	butterflies, bees, hummingbirds
<i>Calypso bulbosa</i>	fairy slipper	purple to magenta	3-8"	May-Aug	full shade	humus	bumblebees



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Resources Available

<https://www.pollinator.org/bff>

SUPPORTING POLLINATORS IN AGRICULTURAL LANDSCAPES
**A TECHNICAL GUIDE FOR
FARMERS AND RANCHERS IN
CALIFORNIA**



SUPPORTING POLLINATORS IN AGRICULTURAL LANDSCAPES
**A TECHNICAL GUIDE FOR
FARMERS AND RANCHERS
THE PACIFIC NORTHWEST**



SUPPORTING POLLINATORS IN AGRICULTURAL LANDSCAPES
**A TECHNICAL GUIDE FOR
FARMERS AND RANCHERS IN
THE NORTHEAST**



SUPPORTING POLLINATORS IN AGRICULTURAL LANDSCAPES
**A TECHNICAL GUIDE FOR
FARMERS AND RANCHERS IN
THE SOUTHEAST**



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Resources Available





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Thank you

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