

# Pollinators (especially BEES) are in the News

## Bees bring new buzz to Capitol Hill

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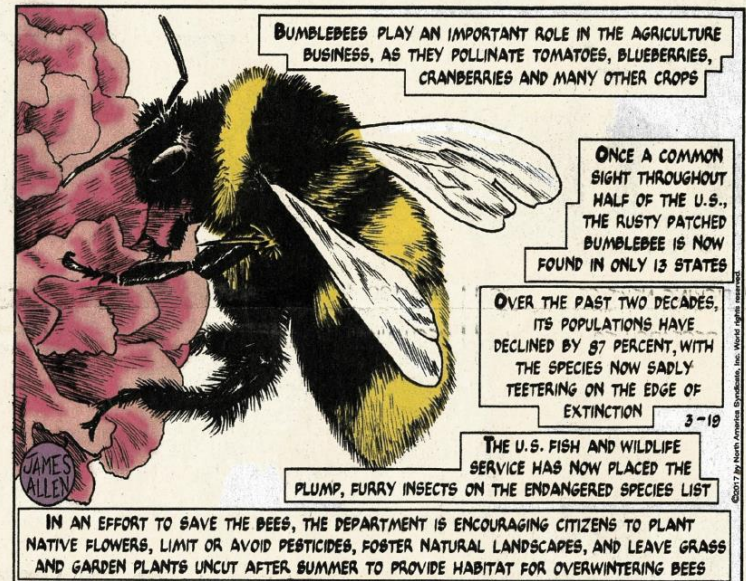
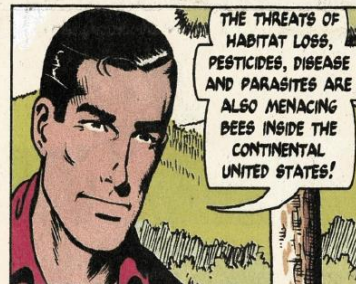
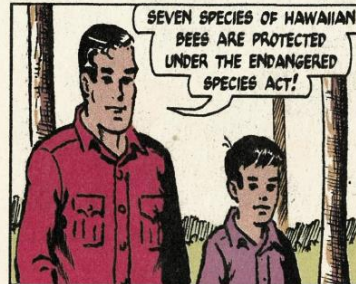
By DAVID ROGERS | 5/13/13 11:31 PM EDT

vol 13 issue 10 • sept 1 sept 14



## Rusty Patched Bumble Bee Federally Listed as Threatened

### MARK TRAIL / by James Allen



ONCE A COMMON SIGHT THROUGHOUT HALF OF THE U.S., THE RUSTY PATCHED BUMBLEBEE IS NOW FOUND IN ONLY 13 STATES

OVER THE PAST TWO DECADES, ITS POPULATIONS HAVE DECLINED BY 87 PERCENT, WITH THE SPECIES NOW SADLY TEETERING ON THE EDGE OF EXTINCTION

3-10

THE U.S. FISH AND WILDLIFE SERVICE HAS NOW PLACED THE PLUMP, FURRY INSECTS ON THE ENDANGERED SPECIES LIST

IN AN EFFORT TO SAVE THE BEES, THE DEPARTMENT IS ENCOURAGING CITIZENS TO PLANT NATIVE FLOWERS, LIMIT OR AVOID PESTICIDES, FOSTER NATURAL LANDSCAPES, AND LEAVE GRASS AND GARDEN PLANTS UNMOWN AFTER SUMMER TO PROVIDE HABITAT FOR OVERWINTERING BEES



# Pollinator Habitats for Western Oregon Soil School – April 8, 2017

## What I'll Cover:

- What is Pollination?
- What are Pollinators?
- Why are They Important?
- What do They Need?
- Why Use Native Plants to Create Habitats?
- Building Your Own Pollinator Habitats
- Seeding pollinator habitats
- A Study and Other Resources in the Community



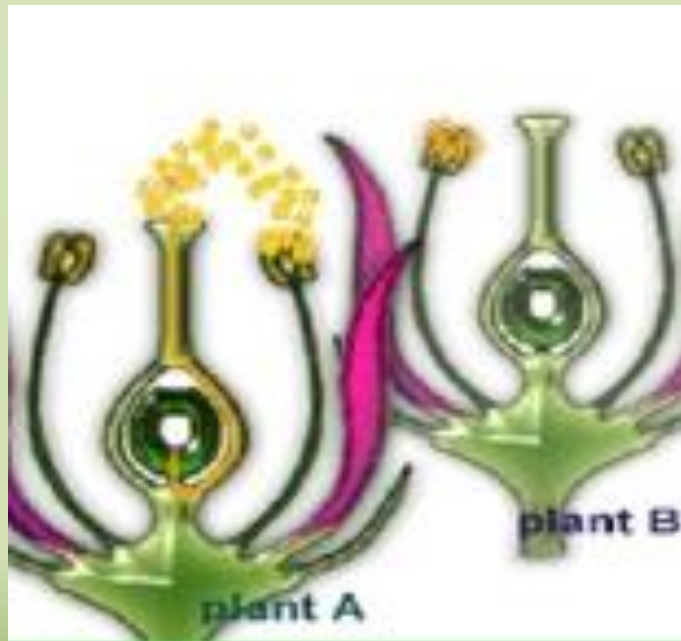
Kathy Pendergrass  
USDA-NRCS  
Oregon Plant Material  
Specialist  
(Botanist/Ecologist)



# What is Pollination?

- **Pollination:** The transfer of pollen from the male **anther** to the female **stigma**

Self Pollination



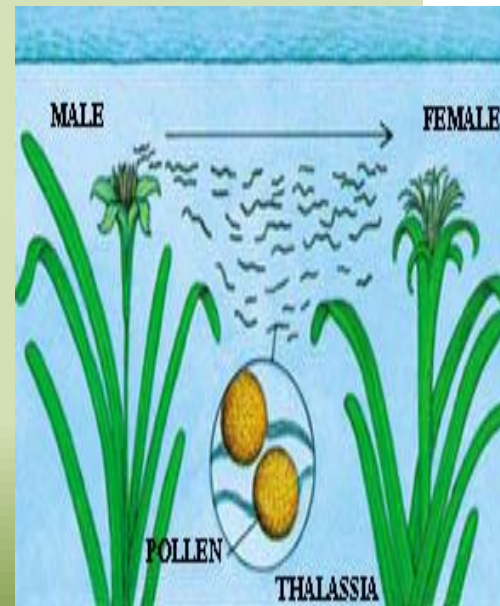
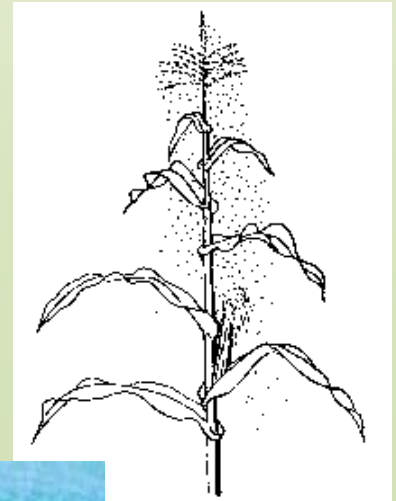
Cross Pollination





# Modes of Pollen Movement



- WIND – Anemophily – copious pollen!  
WATER – Hydrophily - rare
- ANIMALS ~ = POLLINATORS
  - \*\*Insects: Entomophily








# What are Pollinators?

## BEETLES




Beetles were probably some of the first animal pollinators. They feed on pollen and flower parts. Flowers that rely on beetle pollination are white to green, produce lots of pollen, and have large bowl-like petals.

## FLIES



Adult flies typically visit flowers to drink nectar. Many types of flowers attract flies, but those that specialize in fly pollination are often brown to dark purple, rotting-smelling, and shaped like a shallow funnel or trap.

## BUTTERFLIES



Larvae eat plant vegetation. Adults have strawlike mouthparts to drink nectar. Flowers attractive to butterflies are bright red or purple, make lots of nectar, and have long tubular petals with large landing areas.

## WASPS



Wasps are related to bees, but the larvae are typically carnivorous and fed honey by their mothers. Adult wasps often still visit flowers for nectar.

## BIRDS








Hummingbirds rely on flower nectar. Other birds consume nectar and fruit. Flowers attractive to birds are red, orange, or white. Hummingbird pollinated flowers have long tubes to match their long tongue and beak.

## BATS

More than 300 species of fruit are bat pollinated, including bananas, mangos and guava. Bat-pollinated flowers open only at night, are white or light green, emit a strong scent, and produce both pollen and nectar.

## BEES

Bees are the most common pollinators. They are likely responsible for the diversity of flowering plants found today, while bees so born would not have evolved without flowering plants. They completely rely on flowers for food during all life stages. Flowers attractive to bees are usually white, blue, or yellow, sometimes with ultraviolet patterns humans cannot see. Females have structures for carrying pollen, and often have an electrostatic charge that attracts pollen to their bodies. There are more than 26,000 species of bee worldwide, more than the number of bird and mammal species combined!



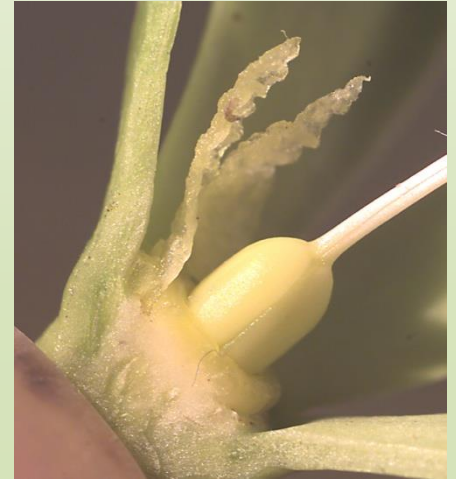


# Why do animals pollinate plants?

**They get a REWARD: food!**

- **Nectar** – a sugary solution produced in flower nectary's
- **Pollen** – is high in protein, some bees and beetles eat it.

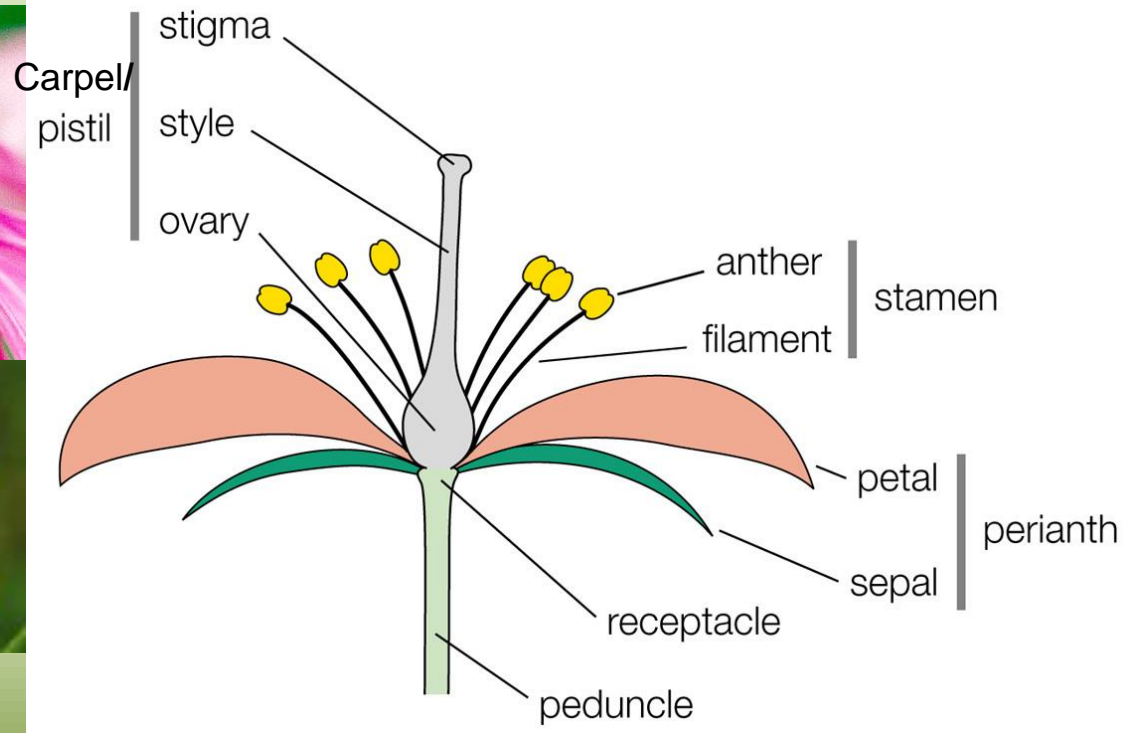
**Factoid:** Flowers can produce two kinds of pollen: a normal and a sterile, but tasty, kind, for the insect.





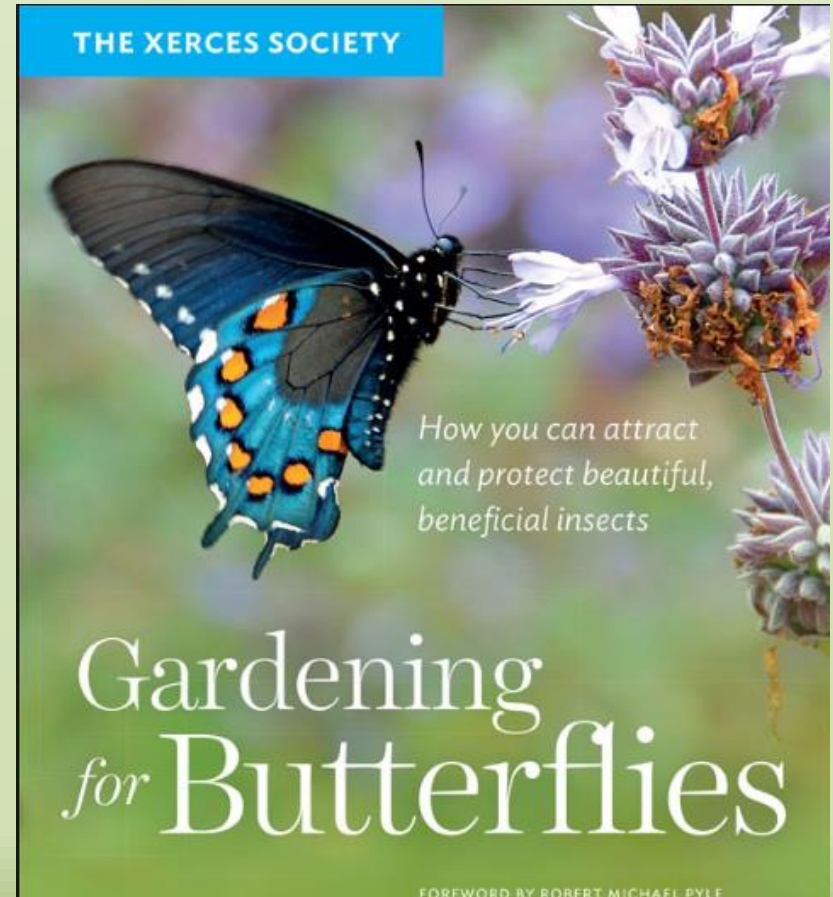
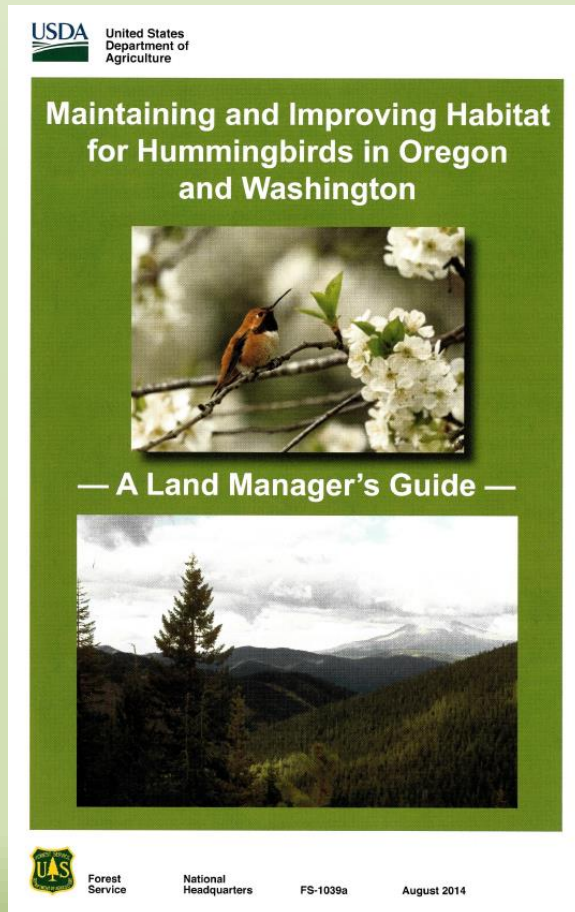
# Function of a flower

- To attract pollinators with colorful petals, scent, nectar guides, nectar and pollen





# Gardening for Birds and Butterflies





# Animal pollinators: Bees

- Bees – are the most important group of flower pollinators
- They feed on nectar and pollen.
- Bees are guided by sight and smell
- See **yellow** and **blue** colors, also ultraviolet light
- Flowers have “honey guides” and bee landing platforms..





# Why are Pollinators Important?

- 75% of Flowering Plants require a Pollinator (esp. bees)
- 35% of Crop Production requires a Pollinator - \$20 Billion annually in U.S.
- 1 of 3 Bites you take required a Pollinator
- Bees are the #1 Pollinator





# European Honeybees

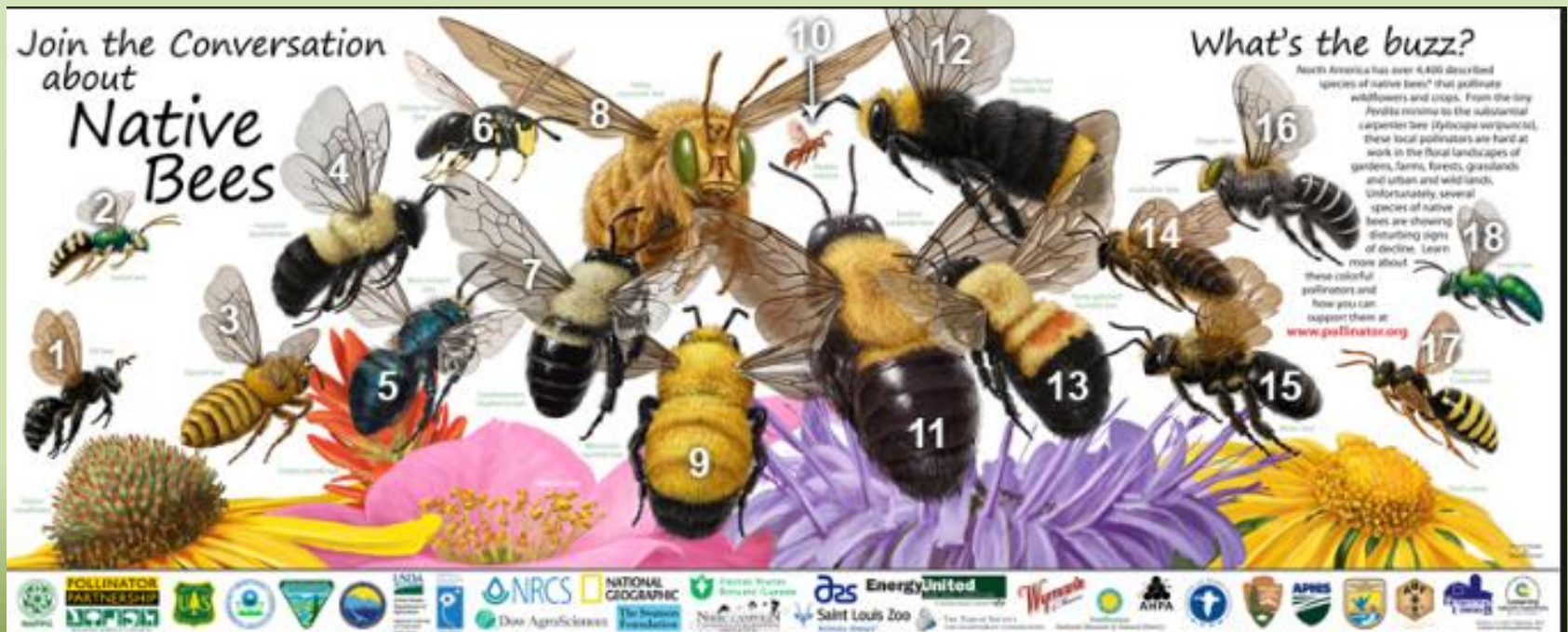
- Majority of U.S. Crops are Introduced Plants
- European Honeybee is No. 1 Pollinator - \$15 Billion of the \$20 Billion annually
- 50% Decline since 1950's - 4.5 Million Hives down to 2.2 Million Hives
- “Colony Collapse Disorder” – pests, diseases, poor nutrition, pesticides





# Why are NATIVE Bees Important?

- 4,000 Species in U.S.
- ~400 Species in Oregon
- Native Bees Can be More Efficient Pollinators (buzz)
- Native Bees forage in colder and wetter weather
- 95+ % are Solitary
- Most Don't Sting!





# What do Native Bees Need?

❖ Clean Water

❖ Shelter

- Nesting sites
- Over-wintering sites

❖ Food

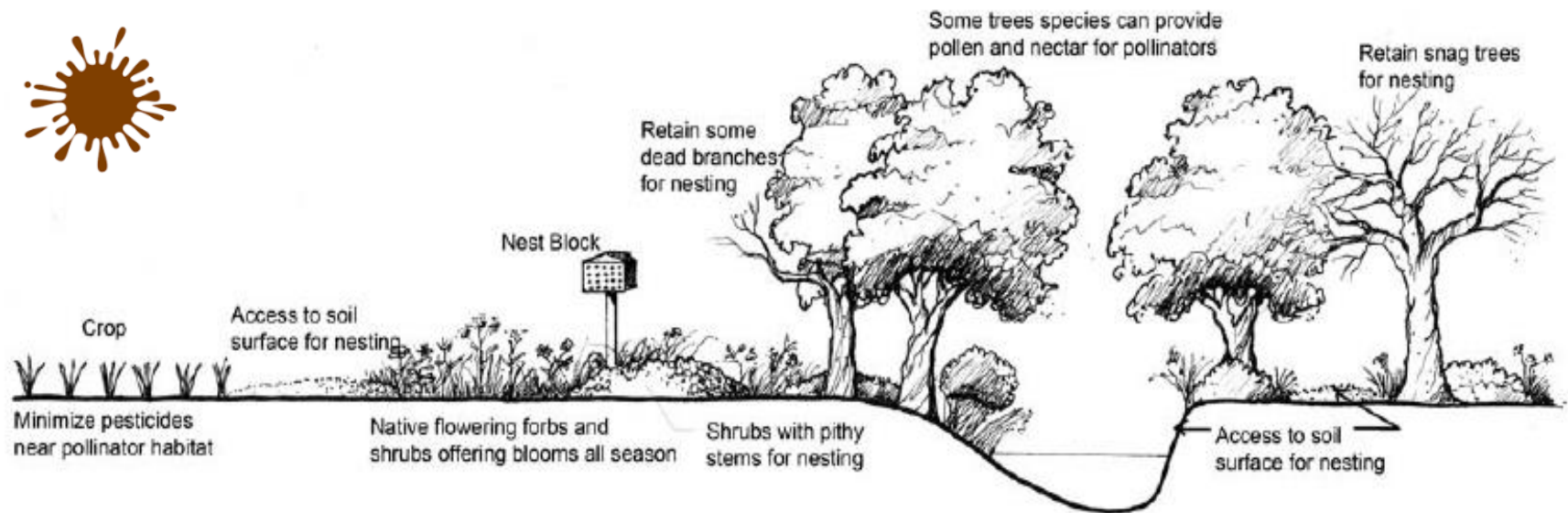


Figure 1. From: Agroforestry Note – 34: “Enhancing Nest Sites for Native Bee Crop Pollinators”



# What do Native Bees Need?

Soil Nest Sites – 70%  
of bees nest in soil

- ✓ *Bare Soil*
- ✓ *Undisturbed – NO Tillage*
- ✓ *Well-Drained*
- ✓ *Warm Aspect – South or West*
- ✓ *Leave Grassy clumps*



Photo by Jon Gosling



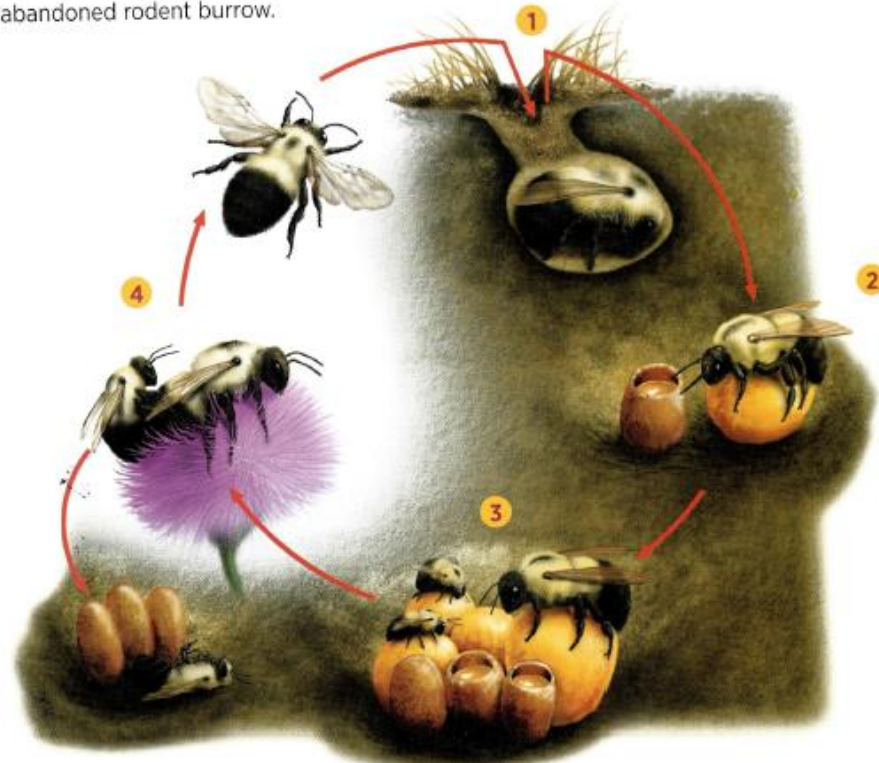


# Bumble Bee Life Cycle

## LIFE CYCLE OF A TYPICAL BUMBLE BEE COLONY

1. A queen emerges from hibernation in spring and finds a nest site, such as an abandoned rodent burrow.

2. She creates wax pots to hold nectar and pollen, on which she lays and incubates her eggs.



4. In autumn the colony produces new queens and male bees, who leave to find mates. Newly mated queens hibernate and the rest of the bees die.

3. When her daughters emerge as adults, they take over foraging and other duties.

From:  
Attracting  
Native  
Pollinators  
– 2011 The  
Xerces  
Society



# Bees – Seasonal Duration

## Bees Need Pollen and Nectar Before and After Crop Bloom

- Example: flight periods of native bees in relation to blueberry bloom.

BEE GROUPS	APRIL	MAY	JUNE	JULY	AUG	SEP	OCT
<i>Plaster Bees</i>							
Mining Bees							
Green Sweat Bees							
Striped Sweat Bees							
Mason Bees							
Bumble Bees							

© Data from Steve Javorek, Agriculture Canada



Agriculture and  
Agri-Food Canada

Agriculture et  
Agroalimentaire Canada

Canada



# ❖ Wood Nesters – 30% of Bees nest in wood

- ✓ Allow for more “chaos” - leave snags, dead limbs, brushy piles, herbaceous stems
- ✓ Supply “pithy” plants
- ✓ Supply nest boxes



Insect Hotel



Maryann Frazier  
PSU Entomology





# Farmscaping for Pollinators

## Fill in the GAPS on Your Property for Water, Shelter and Food



### Riparian Buffers Food and Shelter

Habitat along streams should contain a diversity of plants. Willows, in particular, will nourish bumble bee queens in the spring so that large numbers of workers are available when crops begin to bloom.



### Snags Shelter

Keeping dead trees standing provides shelter for native bees. Some solitary bees build nests in abandoned beetle tunnels in snags.



### Fallow Fields and Set-Asides Food and Shelter

Even small areas of fallow or unproductive land, especially when sown with native flowers, can offer important resources for native bees.



### Hedgerows or Windbreaks Food and Shelter

Creating hedgerows with a wide variety of plants that have overlapping flowering periods will provide bee habitat throughout the growing season and strengthen populations of natural enemies of crop pests.



### Natural or Undeveloped Areas Food and Shelter

Nearby natural areas may harbor all the native bees needed to pollinate your farm's crops. Consider inviting your neighbors to help with safeguarding these habitats.



### Gardens Food

A vegetable, flower, or herb garden, with a diverse assortment of plants, is a good source of food for pollinators. Be wary of fancy hybrids that may produce little pollen or nectar.

### Pesticides

Insecticides kill pollinators outright, and herbicides may destroy plants important for both food and shelter. It is preferable to minimize your use of pesticides and to carefully choose products and application methods.



### Temporary Bee Pasture Food

Planting fields with clover or other inexpensive seed—or allowing crops such as lettuce, kale, basil, and broccoli to bolt—will supply bees with nectar and pollen.



### Ponds and Ditches Food and Shelter

When you create a pond or ditch, leave the pile of excavated soil. Ground-nesting bees may build nests in stable, bare areas of this mounded earth. Planting clumps of native flowers will attract more pollinators.



### Field and Road Borders Food and Shelter

Leave areas next to fields untilled and unsprayed to support flowering plants and provide nest sites for ground-nesting bees.



### Cover Crops Food

Flowering plants—certain legumes in particular—can be included in cover-crop mixes to supply pollen and nectar.

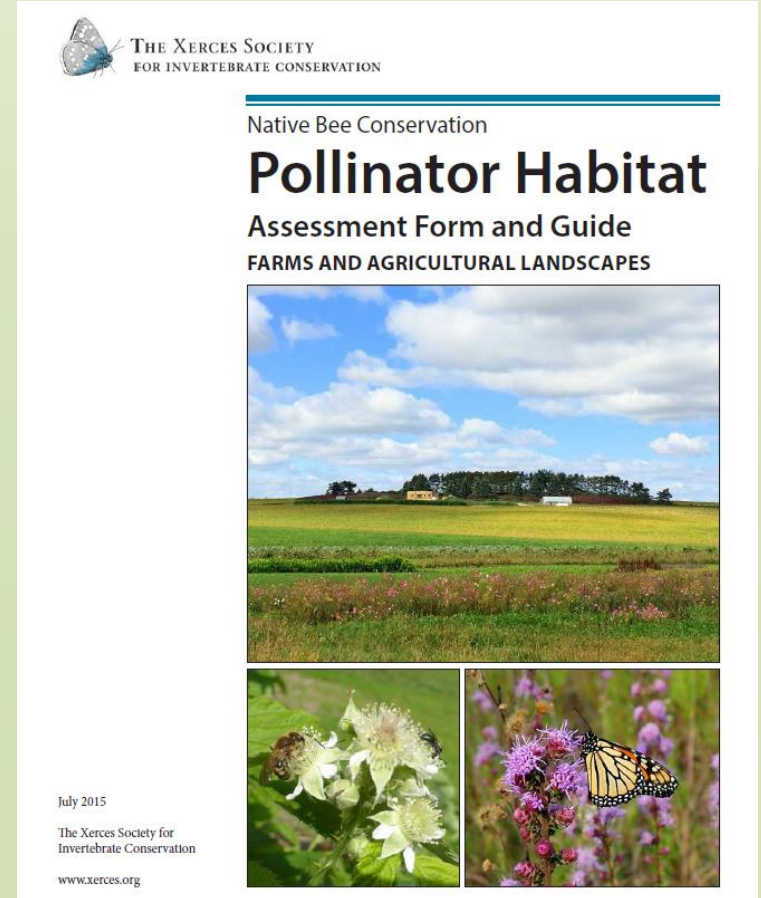
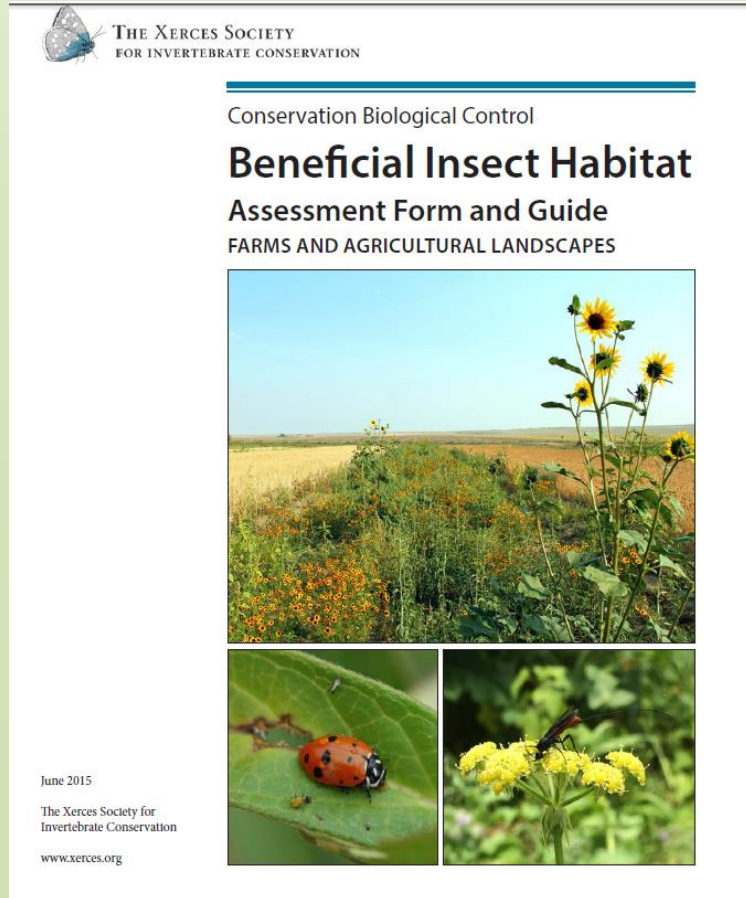


### Artificial Nests Shelter

Making bee blocks for wood-nesting bees is a good way to increase the number of native bees in your landscape.



# Assess Existing Habitat on Your Farm



<http://www.xerces.org/pollinator-conservation/habitat-assessment-guides/>



# Three Basics

## Focus on:

1. Minimizing pesticides - IPM
2. Protecting /enhancing nest sites for pollinators (bees)
3. Providing season-long blooming plants

## TECHNICAL NOTES

U. S. DEPT. OF AGRICULTURE  
Portland, Oregon

NATURAL RESOURCES CONSERVATION SERVICE  
March 2008

PLANT MATERIALS No. 13

### PLANTS FOR POLLINATORS IN OREGON

Kathy Pendergrass, Plant Materials Specialist, NRCS, Portland, Oregon  
Mace Vaughan, Conservation Director, Xerces Society, Portland, Oregon  
Joe Williams, Manager, NRCS, Plant Materials Center, Corvallis, Oregon



Left - honey bee on camas flower (Pendergrass)



Right - bumble bee on rabbit brush (Vaughan)

The purpose of this technical note is to provide information about establishing, maintaining and enhancing habitat and food resources for native pollinators, particularly for native bees, in Riparian buffers, Windbreaks, Hedgerows, Alley cropping, Field borders, Filter strips, Waterways, Range plantings and other NRCS practices. We welcome your comments for improving any of the content of this publication for future editions. Please contact us!



# A Year-Long Succession of Blooming Plants (3 blooming early, mid, late)

\*  
willows  
\*



Mules ears



Mules-ears

Red-osier  
dogwood



Lupines



Western  
columbine



Spreading  
dogbane



Douglas  
spiraea





Many of the same flowering plants that support pollinators also support predators and parasitic insects of plant pest insects – and most other wildlife.

(Xerces slide)



**Soldier beetle**



**Syrphid fly drinking raspberry nectar**



**Parasitoid wasp**



**Ladybird beetle**

Photos: Mace Vaughan, Paul Jepson, Mario Ambrosino



# Plantings for Pollinators

- ❖ Crop rotations
- ❖ Annual Insectary
- ❖ Cover Crops
- ❖ Perennial Plantings



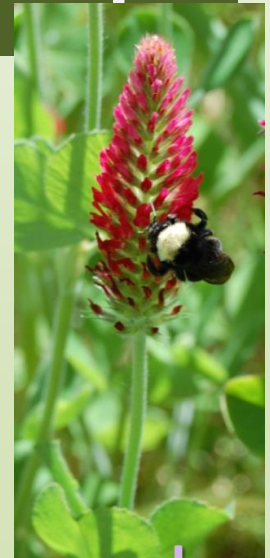


# Bee-Friendly insectory/ cover crops

Common vetch



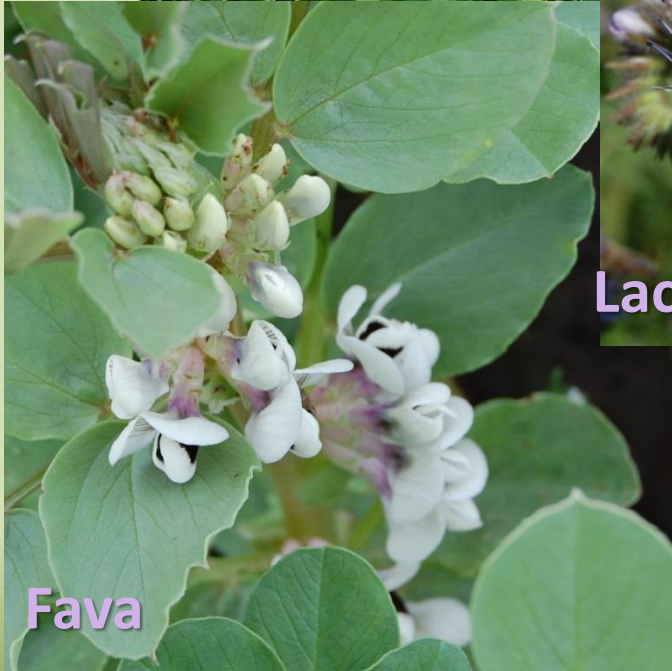
Crimson clover



Lacy phacelia



Fava



Frosty berseem clover





# Configure annual/insectary plantings to fit into your farming system





# What do Flowering cover crops do?:

- ❖ Improve soil fertility & health
- ❖ Conserve soil moisture
- ❖ Suppress weeds
- ❖ Reduce erosion
- ❖ Improve infiltration
- ❖ Provide seed (food, crop)
- ❖ Provide habitat for beneficial insects

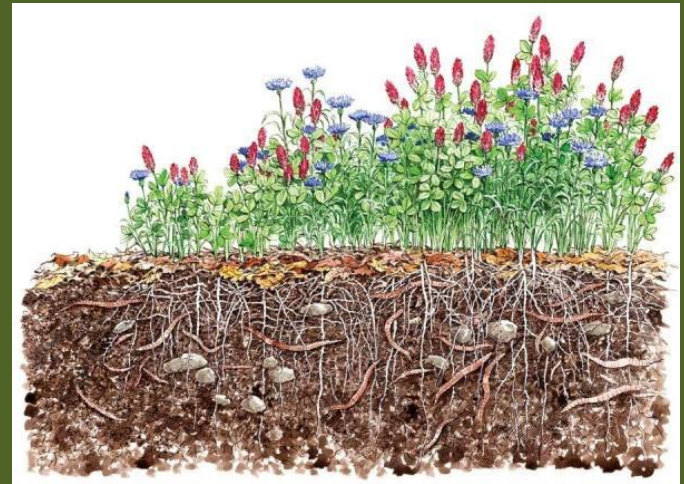


Illustration: Elayne Sears  
From Mother Earth News



# Perennial Plantings

## Benefits (esp. Hedgerows):

- Displace invasive weeds
- Prevent soil erosion esp. in riparian areas
- Prevent pesticide drift (careful!)
- Prevent weed seed migration
- Lower crop damage from wind and dust
- Provide habitat for beneficial organisms such as birds, bats, insects and pollinators





# Why Use Native Plants to Create Habitats?

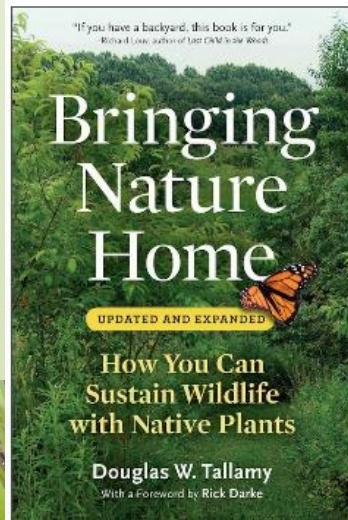
“Agriculture:  
the largest  
threat to  
biodiversity  
and  
ecosystem  
function of  
any single  
human  
activity”



Willamette Valley, n of Albany, ca 1970, bb003272 - Oreg. Hist. Soc. Research Lib., bb003272



# Why Use Native Plants?



- They grew up here ;-)  
adapted to local climate;  
drought tolerant
- Less “weedy”
- Increase species of  
declining habitats (prairie  
and oak)
- Increase native habitat  
connections in your area
- Feed wildlife – food webs –  
insects, seeds, fruits, vegetation

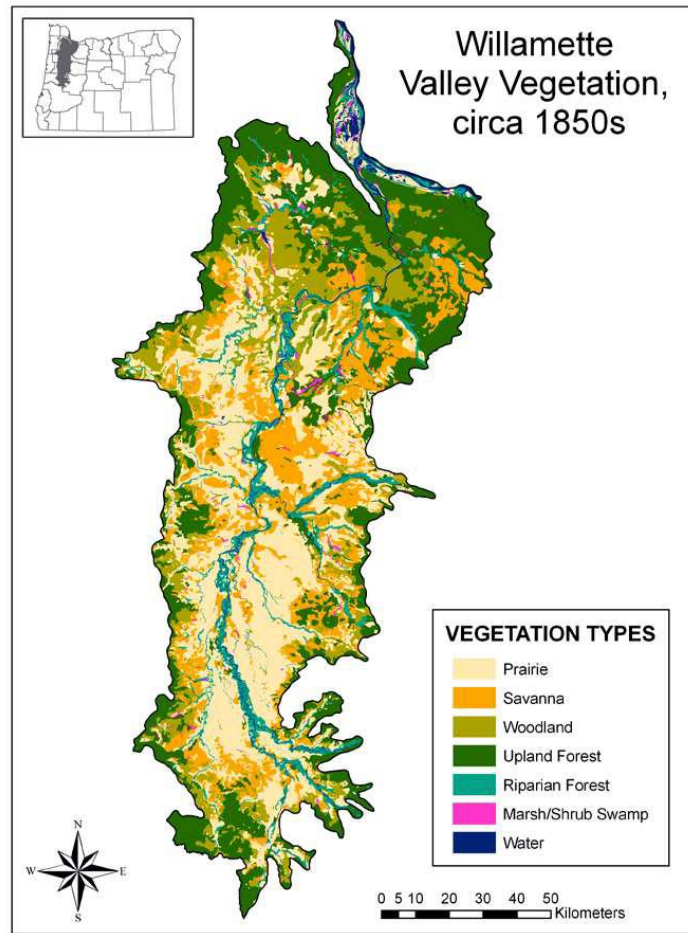




# Why use Native Plants?

Less than 1 percent of prairie and less than 15 percent of oak habitats remain in Willamette Valley

Provide for travel corridors, “stepping stones”, or islands for species gene flow and dispersal



Reference: John Christy and Ed Alverson, 2011

“Live”,  
“Salmon Safe”  
and other  
labeling is  
requiring  
some  
biodiversity  
plantings  
&/or  
vegetation  
protection or  
restoration





❖ Native bees prefer native plants over exotic weeds!

**Restoration Ecology**

THE JOURNAL OF THE SOCIETY FOR ECOLOGICAL RESTORATION INTERNATIONAL

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RESEARCH ARTICLE

# **Bee Preference for Native versus Exotic Plants in Restored Agricultural Hedgerows**

Lora A. Morandin<sup>1,2</sup> and Claire Kremen<sup>1</sup>



# Why Use Native Plants?

Prairie species richness (often >30 native plants!)





# Retain Intact Wild Habitats





# Hedgerows



*Bring back the hedgerows – but make them native and species-diverse this time!*

## Hedgerows

8+1 0

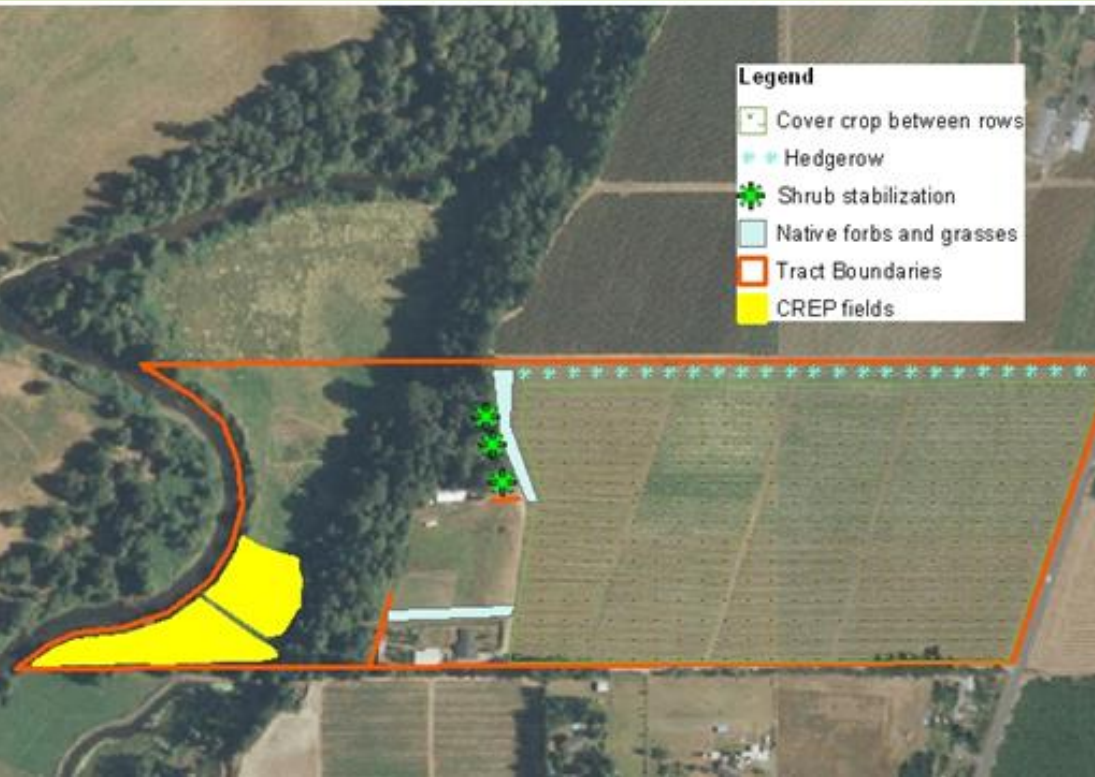
By [Kelly Brenner](#) 6 Comments



Irish Hedgerows



# Making a Plan for Plantings



1. Site Selection
2. Site Preparation
3. Plant Selection and Sourcing
4. Plant & Mulch - or seed
5. Supplemental Water 1-3 years
6. Maintenance  
(mow, spot-spray, weed)



# 1. Site Selection

- Take advantage of “un-used” land: Ditches, Field Edges, Wet swales, streams
- Consider weediness of chosen sites for plantings
- Place plantings where not susceptible to or protect from herbicide drift & can be undisturbed (ground nests for bees)
- Consider plant heights, sun orientation – adjacent crops
- Can be “dual purpose” (e.g. riparian buffer)





## 2. Site Preparation – money well-spent!

- Very important to eliminate weeds before planting
- May require 1-3 years for adequate site prep
- Many methods available—tillage, mowing, spraying with herbicides, solarization with plastic, lasagna mulching, etc.



UC Statewide IPM Project  
© 2000 Regents, University of California

Photo by Jack Kelly Clark, UC Statewide IPM Project



[www.bigrocktrees.com](http://www.bigrocktrees.com)





## 2. Site Preparation – Xerces Job Sheets



THE XERCES SOCIETY  
FOR INVERTEBRATE CONSERVATION

### Conservation Cover (327) for Pollinators: **Western Oregon & Washington** Specifications and Implementation Requirements



*Native wildflower meadow in Oregon, dominant flowers in bloom include slender clarkia, selfheal, and lupine. (Photograph by Eric Lee-Miller, The Xerces Society.)*

June 2013

The Xerces Society for  
Invertebrate Conservation

[www.xerces.org](http://www.xerces.org)



THE XERCES SOCIETY  
FOR INVERTEBRATE CONSERVATION

### Hedgerow Planting (422) for Pollinators: **Western Oregon & Washington** Specifications and Implementation Requirements



*Western humble bee (Bombus occidentalis) foraging on Canada goldenrod (Solidago canadensis). (Photograph by Rich Haffield, The Xerces Society.)*

June 2013

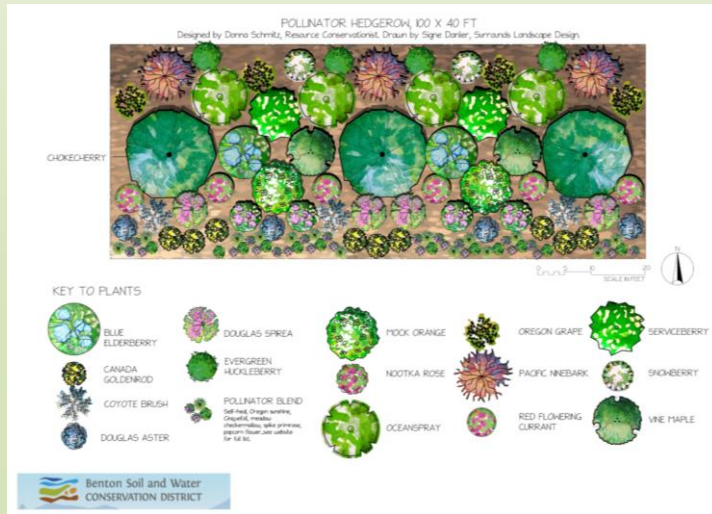
The Xerces Society for  
Invertebrate Conservation

[www.xerces.org](http://www.xerces.org)

<http://xerces.org/pollinator-conservation/agriculture/pollinator-habitat-installation-guides/>



### 3. Plant Selection and Sourcing



- Choose plants suitable for your objectives – aesthetics, pesticide screening, bee-friendly, drought tolerant
- Choose plants suitable for your site conditions – moisture, light, soil, and nutrient
- Choose plants suitable for your crop (not harboring crop pests/diseases)
- Consider diversity of flower colors and shapes (open flowers)
- Plan for Season-long bloom – including crop bloom
- Consider Budget, equipment, and available plant materials – plants can be costly



# Some plants that harbor crop pests

## Exceptions: Native Plants That Host Crop Pests

Primary Crop	Crop Pest or Disease	Known Alternate Hosts of Crop Pests or Diseases
Apples, Pears	Apple Maggot ( <i>Rhagoletis pomonella</i> )	Hawthorn ( <i>Craetagus</i> spp.), Wild Plum ( <i>Prunus</i> spp.)
Apples, Pears	Fire Blight ( <i>Erwinia amylovora</i> )	Mountain Ash ( <i>Sorbus</i> spp.), Spirea ( <i>Spiraea</i> spp.), Hawthorn ( <i>Crataegus</i> spp.), Cotoneaster ( <i>Cotoneaster</i> spp.), Toyon ( <i>Heteromeles arbutifolia</i> ), Ocean Spray ( <i>Holodiscus discolor</i> )
Apples, Pears, Cherries, Peach	Leafroller Caterpillars (several species)	Wild Rose ( <i>Rosa</i> spp.)
Grapes	Leafhoppers/Sharpshooters (several species)	Willow ( <i>Salix</i> spp.), Elderberry ( <i>Sambucus</i> spp.)
Berries	Spotted-Wing Drosophila ( <i>Drosophila suzukii</i> )	Wild Plum ( <i>Prunus</i> spp.), Elderberry ( <i>Sambucus</i> spp.), Wild Raspberry ( <i>Rubus</i> spp.)

Farming with Native Beneficial Insects – 2014 The Xerces Society

Generally – all fleshy fruits harbor  
Spotted-winged drosophila



## Native plants for Willamette Valley yards



**Good for wildlife.  
Good for gardens.**



### From Metro and local partners

[http://www.oregonmetro.gov/  
native-plants-willamette-  
valley-yards-booklet](http://www.oregonmetro.gov/native-plants-willamette-valley-yards-booklet)

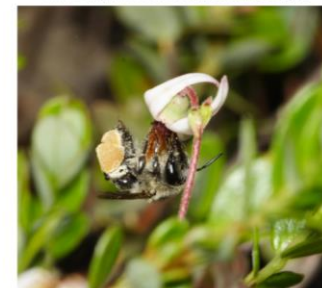
## TECHNICAL NOTES

NATURAL RESOURCES CONSERVATION SERVICE  
February 2017

PLANT MATERIALS NO. 42

## Enhancements for Native Bees in Western Oregon and Washington Cranberry Production

Kathy Pendergrass, Plant Materials Specialist, NRCS, Portland, Oregon  
Mace Vaughan, Xerces Society, Portland, Oregon



A native bee (*Melitta americana*) foraging on cranberry (*Vaccinium macrocarpon*).  
(Photograph by Michael Veit [http://www.discoverlife.org/mp/20p?see=I\\_VEIT1&res=640](http://www.discoverlife.org/mp/20p?see=I_VEIT1&res=640))

The purpose of this technical note is to provide information about improving native pollinator services for cranberry production in western Oregon and western Washington.

## TECHNICAL NOTES

NATURAL RESOURCES CONSERVATION SERVICE  
March 2008

PLANT MATERIALS No. 13

## PLANTS FOR POLLINATORS IN OREGON

Kathy Pendergrass, Plant Materials Specialist, NRCS, Portland, Oregon  
Mace Vaughan, Conservation Director, Xerces Society, Portland, Oregon  
Joe Williams, Manager, NRCS, Plant Materials Center, Corvallis, Oregon



Left - honey bee on camas flower (Pendergrass)



Right – bumble bee on rabbit brush (Vaughan)

The purpose of this technical note is to provide information about establishing, maintaining and enhancing habitat and food resources for native pollinators, particularly for native bees, in Riparian buffers, Windbreaks, Hedgerows, Alley cropping, Field borders, Filter NRCs practices. We welcome your comments for improving editions. Please contact us!

Table 1. Plants for Pollinators. Most shrub and herbaceous plants on this list can be maintained as a hedge or cut back to 3 feet tall (or shorter during the dormant season). For woody plants, the NRCS practices 'Hedgegrove' (422), 'Tree and Shrub Site Preparation' (400), or 'Tree and Shrub Establishment' (612), can be used to establish plants. For herbaceous plants, the NRCS Conservation Cover (327) and Field Border Practices (386) can be used to plant or seed new plants onto a site. For more information on NRCS practices, visit [www.nrcs.gov](http://www.nrcs.gov). For more information on the plants listed, visit [www.nrcs.gov/plants](http://www.nrcs.gov/plants). For these pollinator plants, it is unknown whether some of these species might spread into crabapple beds - plantings should be monitored and managed accordingly. All plants will need supplemental summer watering for 2-3 years after establishment; non-native plants may require supplemental summer water indefinitely. Plant survival and bloom will be enhanced with some supplemental watering during summer drought. Plants do well with full sun to partial shade, unless otherwise indicated in notes.

COMMON NAME	SCIENTIFIC NAME	N - native, I - introduced	Flower Color	Growth Form	Mature Height (feet)	Planting Distance Apart (feet)	Water Needs	Wind-blown seed - or potential for weedy bulbs	NOTES
Early Season Blooming Species									
Big leaf Maple	<i>Acer macrophyllum</i>	N*	Yellow	Tree	80	15-25	Medium	Yes	Of great importance to young build-up of bear populations. Trees are susceptible to <u>verticillium</u> wilt.
Hairy manzanita	<i>Arctostaphylos columbiana</i>	N*	Pink	Shrub	10	5-10	Low	No	Evergreen. Potentially of high value to early spring birds of significance population - ranges 10-65%. Plants need good drainage
Kinnikinnick	<i>Arctostaphylos uva-ursi</i>	N*	Pink	Shrub	1.5	2-4	Low	No	Evergreen. Prefers well-drained soils. Very tough plant
Rock rose	<i>Artemisia</i> sp.		White	Herbaceous	1	2-3	Low	No	Rock garden plant with low maintenance needs. Best to shear after blooming to keep plant vigorous.
Ashcroftia	<i>Ashcroftia</i> sp.		Purples	Herbaceous	1	3	Low	No	Rock garden plant with low maintenance needs. Best to shear after blooming to keep plant vigorous.
Wallflower	<i>Erysimum</i> sp.		Yellows to oranges	Herbaceous	2	3	Low	No	Rock garden plant with low maintenance needs. Best to shear following to keep plant vigorous.
Tall Oregon Grape	<i>Berberis aquifolium</i>	N	Yellow	Shrub	8	3-5	Low	No	Evergreen. Abundant nectar and pollen - ranges 40-60%
Dwarf Cascade Oregon Grape	<i>Berberis nervosa</i>	N*	Yellow	Shrub	2	3	Medium	No	Evergreen. Does well with pot to full shade.
Winter Blooming Heuchera (early bloomers - several varieties recommended by University Park and Strawberry Point)	<i>Heuchera</i> spp. <i>(Heuchera, Digitalis, Oenothera)</i>	I	White to deep pinks	Shrub	1	3-5	Low	No	Evergreen. Many varieties. Monitor November-April. Very attractive to honey bees. Generally need good drainage. Should shear cut back lightly after flowering to maintain good shape and bloom.

[illegible]



# Cascara (*Frangula* (= *Rhamnus*) *purshianus*)

**Family:** Buckthorn (Rhamnaceae)

**Moisture needs:** wet to dry (FAC)

**Exposure:** Sun to part shade

**Flower:** Flowers in umbels, greenish with 5 petals

**Bloom period:** April-June

**Description:** Deciduous shrub or small tree up to 30' tall; **Leaves alternate, oblong-ovate to oblong-obovate**, 6-13 cm. long, with 10-12 **prominent, lateral veins** on each side; Berries purplish-black

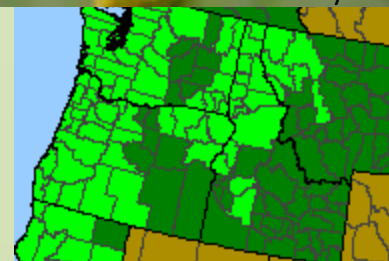
**Habitat:** Forest understory and margins from low to moderate elevations

**Attracts/insects found:** \*bees, beneficials

**Recommended stock:** bare-root, container



Photo by Ben Legler





# 3. Native Plant Selection and Sourcing

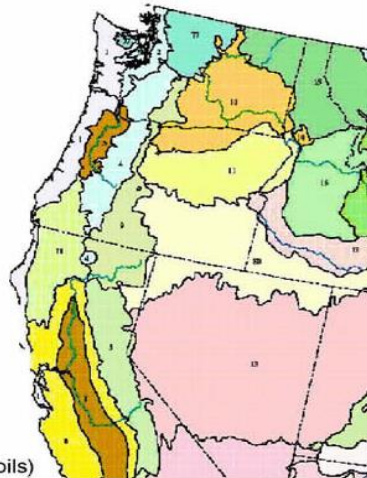
Use local-genetics plants – at least from your ecoregion

Use general forest tree seed zones



Ecoregions

- Columbia Plateau (10)
  - > 15" rainfall / 3,500 ft
  - < 15" rainfall / 3,500 ft
- Northern Basin (80)
  - Low (< 4,500 ft)
  - High (> 4,500 ft)
- Snake River (12)
  - Upper
  - Lower
- Blue Mountains (11)
  - See Erickson et al. 2004
- Central Basin (13) (pseudo-elev)
  - Salt flats – salt desert shrub
  - Sage
  - Sage-Juniper
  - Sage-Woodland (Carbonate soils)



Avg. Maximum  
Temp/ Annual Precip



USDA Regional Provisional Seed  
Zone for herbaceous species



- Very easy "A" list.\* Expect 90-100% success.

Willows Hooker's = Pipers, Northwest sandbar = river, Geyers, Pacific, Sitka, Scouler's	<i>Salix</i> species
black cottonwood	<i>Populus trichocarpa</i>

Easy "B" list. Expect 50-90% success without hormones. Most make good "live stakes".

Black twinberry	<i>Lonicera involucrata</i>
Pacific ninebark	<i>Physocarpus capitatus</i>
Lewis mockorange	<i>Philadelphus lewisii</i>
Common snowberry	<i>Symphoricarpos albus</i>
salmonberry	<i>Rubus spectabilis</i>
Douglas spirea*	<i>Spiraea douglasii</i>
Red elderberry	<i>Sambucus racemosa</i>
Red-osier dogwood	<i>Cornus sericea</i>
Scouler's willow	<i>Salix scouleriana</i>

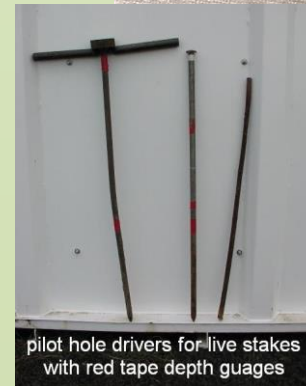
\*Use with caution...can be a bit weedy



# 3. Plant Selection – Plant Stocks

## Hardwood *Cuttings/Stakes*

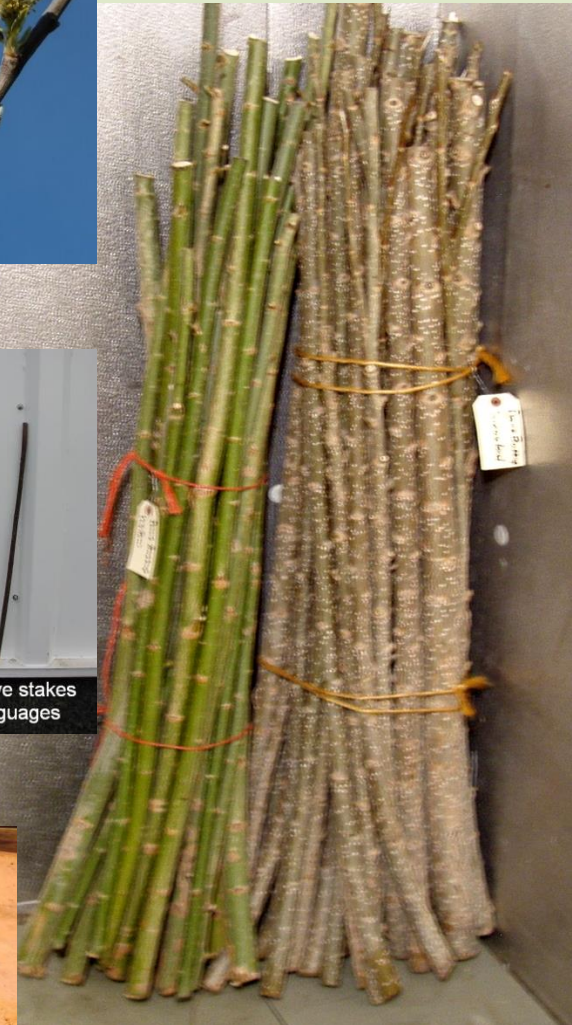
- dormant season
    - here best is late fall
  - cheap, labor, easy install
  - limited species
- 
- ✓ At least 18" (3') long; 1/2" diameter
  - ✓ Leave 2-3 buds above ground
  - ✓ don't damage



pilot hole drivers for live stakes  
with red tape depth gauges



dead-blow hammer is gentler  
on live stakes





# Woody Native Shrubs: Consider Esp. Early & Late Bloomers



Or



Coyote Brush

Early: Willows

Red Osier Dogwood

Twinberry

Oregon Grape

Some Ceonothus spp.

Mid : Oceanspray

Late: Coyote brush





# 3. Plant Selection - Plant Stocks

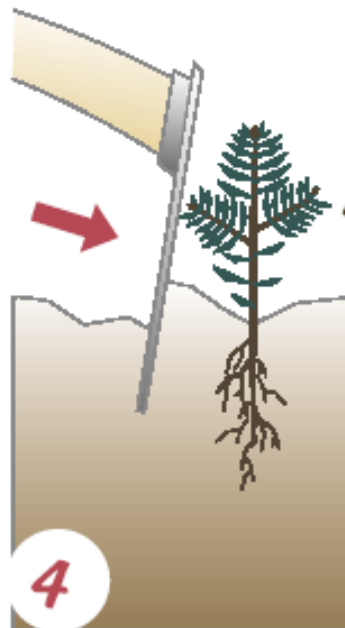
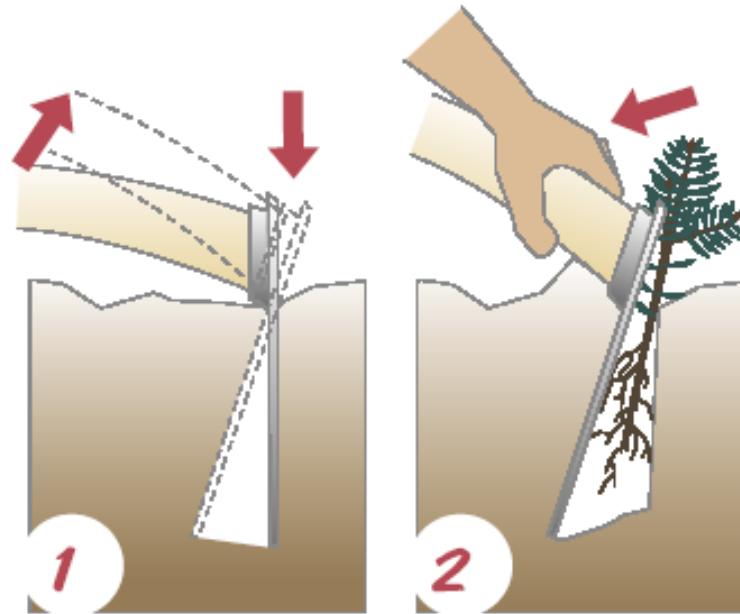
## Bare-root materials

- dormant season -  
here Jan-early March;  
small window,
- must keep cool,  
moist and plant  
immediately,
- harder to plant,
- lower survival
- Cheaper than  
containers





*Planting  
Procedure  
with Hoedad*



1. Insert blade deeply and pull back to open hole. 2. Insert seedling. 3. Backfill gently around roots. 4. Firm soil with planting tool. 5. Pack soil firmly around seedling.

# Planting a Bare- root Plant

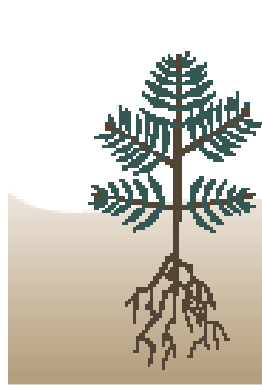
From: Rose R and DL Haase. 2006. *Guide to Reforestation in Oregon*. College of Forestry, Oregon State University, Corvallis. 48p.



# Common Planting Problems

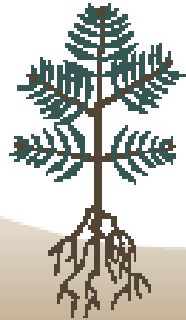
## 1. Too Deep

needles buried  
hole okay  
tree position poor



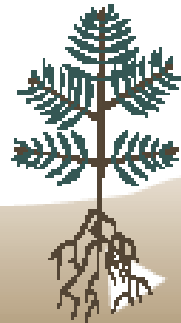
## 2. Too Shallow

roots exposed  
hole too shallow



## 3. Air Pocket

from improper  
tamping



## 4. 'L' Roots

hole shallow



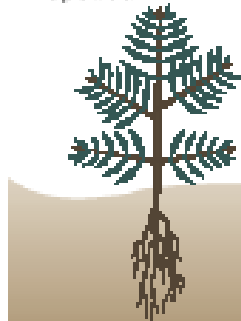
## 5. 'J' Roots

hole shallow  
roots often exposed  
to air



## 6. Compacted Roots

hole too narrow  
not properly  
opened



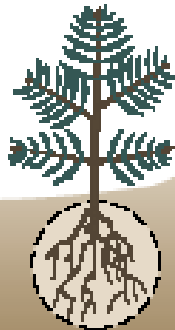
## 7. Not Vertical

shallow planting  
caused by improper  
digging of hole



## 8. Too Loose

improper  
tamping after  
planting



## 9. Poor Planting Soil

planting in rotten wood,  
deep duff or debris,  
not damp mineral soil



## 10. Satisfactorily Planted Tree



From - Rose R and DL Haase. 2006. *Guide to Reforestation in Oregon*. College of Forestry, Oregon State University, Corvallis. 48p.



### 3. Plant Selection - Plant Stocks

#### Containerized stock

- any time of year; best is fall, 2nd early spring;
- better survival,
- available,
- easy to plant
- more expense & labor than stakes/BR,
- Plant even with existing soil in pot – don't plant deep!

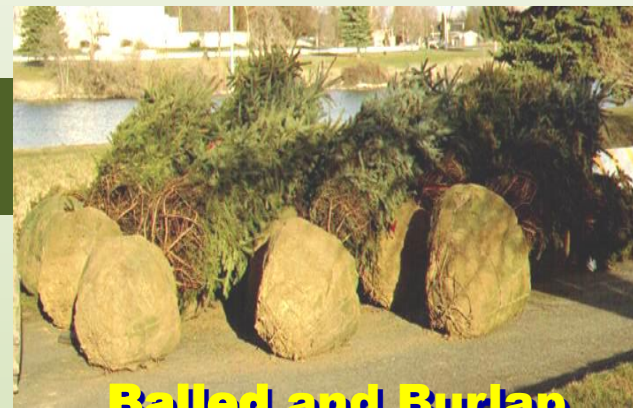




### 3. Plant Selection

- ❖ Balled and Burlaped
- ❖ Bulbs (spring or fall)
- ❖ Rhizomes
- ❖ Seeds (spring or \*fall)

Cheapest, BUT.....



**Balled and Burlap**



**Camas  
Bulbs**



**Rhizomes**



**Seed**



# Healthy Plants?

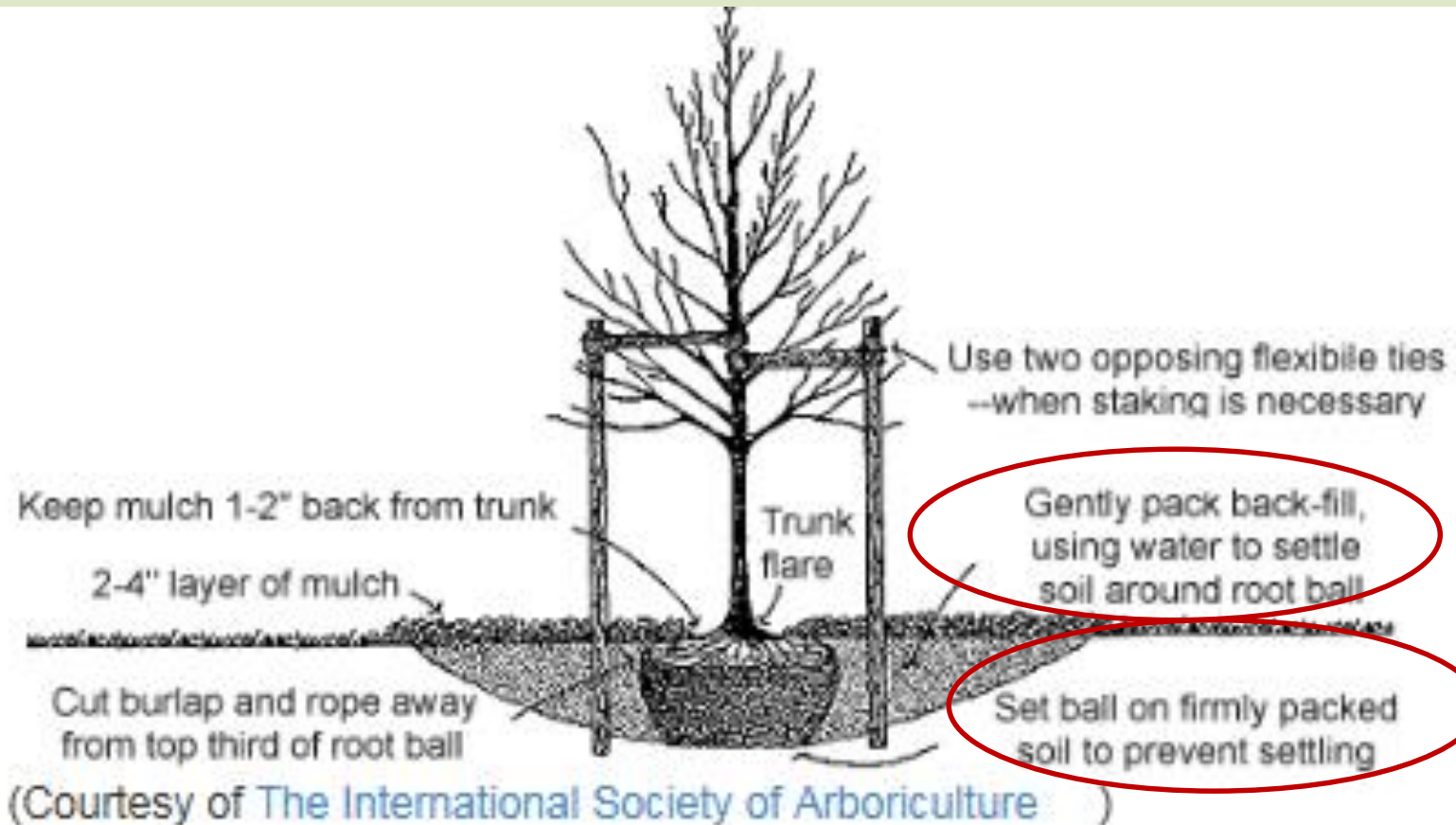


- ✓ 1:1 Root/Shoot Ratio
- ✓ Not root-bound



## 4. Plant and Mulch

### How to plant a container/B&B plant





## 4. Plant and Mulch



- Mulching can help reduce weeds
- and hold soil moisture
- Roots need oxygen too – not deeper than 4”/application
- Mulch on the trunk causes moisture build up, creating ideal conditions for insect pests, diseases, and decay



# Plant Protection

- Protections from animal damage (voles, deer, etc.)
- Options: fencing, tree guards, hardware cloth, tubing



tree guard and plant tube



## 5. Supplemental Water 1-3 years

- If at all possible – will improve survival
- Just during summer drought - ~ 1" every 2-3 weeks
- Drip or deep soak at plant base





## 6. Habitat Maintenance

- Mow weeds
- Spot-spray, propane burn, or hand pull weeds
- May need to invigorate plantings (tillage, burning)





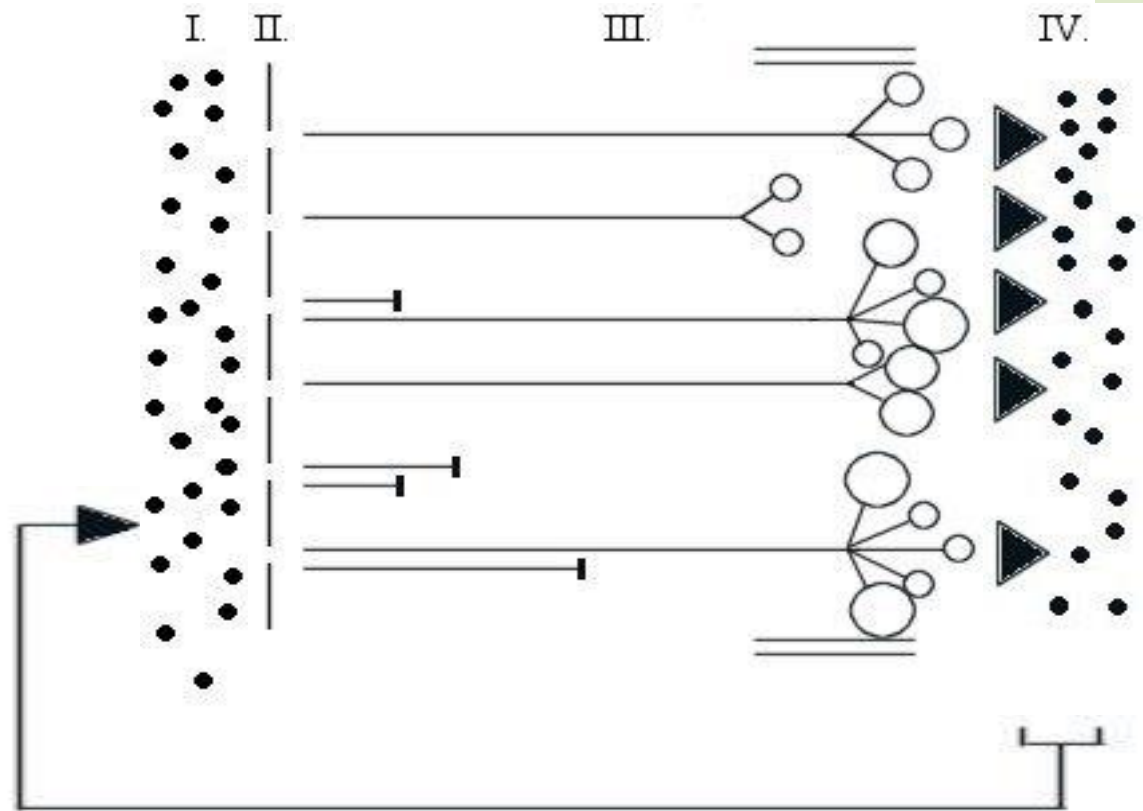
# SEED BANK CONCEPT

Diagrammatic Model of Plant Population Behavior

Harper, J.L. 1977. Population Biology of Plants. Academic Press, London

## Population Biology of Plants

John L. Harper



- I Seed bank
- II Environmental sieve
- III Seedlings, reproductive adults
- IV Seed production



# Seeding – 5 Steps

1. Pick a good site
2. Kill the weeds
3. Choose the right seed mix
4. Seed the site well  
Rake/roll in
5. Kill the weeds  
(mow, spot-spray, or hand weed)



Five Steps to Success for Establishing Perennial Wildflower Plantings for Pollinators:

<https://www.youtube.com/watch?v=ABNZo4KKaYw>



# Where to find Plants/Seed for Planting

## PLANTS:



- Plant Material Technical Note #9 – for plants and seed  
[https://www.nrcs.usda.gov/Internet/FS\\_E\\_DOCUMENTS/nrcs142p2\\_041918.pdf](https://www.nrcs.usda.gov/Internet/FS_E_DOCUMENTS/nrcs142p2_041918.pdf)
- Native Plant Sales



## SEED:

- Native seed network – is a clearing house to connect native seed suppliers to buyers  
<http://www.nativeseednetwork.org/>
- Cover Crop Resources and Seed Vendors for Oregon and Washington  
[https://www.nrcs.usda.gov/Internet/FSE\\_PLANTMATERIALS/publications/orpmctn12333.pdf](https://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/orpmctn12333.pdf)





# Where to find Native Plants



## Gardening With Native Plants

### What is a native?

Oregon native plants are those which occur or historically occurred naturally in our state, and established in the landscape independently of direct or indirect human intervention.

### Where to purchase native plants

Below is a table of Oregon native plant species that are available for wholesale and retail sale. Users can sort the table by nursery, by common name, or by scientific name. Details about the plant sellers can be found by clicking on the nursery's information icon or [here](#).



### Why natives?

Native plants are wise gardening choices. If planted in a habitat comparable to their natural one, they will:

Use less water, fertilizer, and pesticides when established.  
Capture the unique character of a region by preserving its biological heritage and maintaining genetic diversity.  
Provide food and habitat for native pollinators, birds, and other animals.  
Serve as biodiversity corridors, connecting distant natural areas with critical strands of native habitat through urban areas.

### Native plant sellers:

Are you interested in having your native plant inventory listed here?

Contact us at [ofpflora@oregonflora.org](mailto:ofpflora@oregonflora.org) and include "gardening" in the subject line.

### Watch our Gardening page grow!

The Oregon Flora Project is developing resources about native plants for gardens and landscapes. Here you will be able to find information about the commercial availability of native species, characteristics of plants and their growth requirements, and links to more information within the oregonflora.org website and beyond. Our partners include Portland Metro and the Adult Conservation Educators Working Group. Financial support comes in part from the Oregon Dept. of Agriculture's Specialty Crop Block Grant Program.

Nursery Regions - [\[ All Regions \]](#)

W: wholesale R: retail

[Portland Metro](#) [Willamette Valley](#) [Eastern OR](#) [Coast](#) [Siskiyou](#)

Taxa:587, nurseries:28 (scroll right for more)

Plant Names	Portland Metro	Willamette Valley	Eastern OR	Coast	Siskiyou
achlys <i>Achlys triphylla</i>					
alder, mountain <i>Alnus incana</i>					
alder, mountain <i>Alnus incana ssp. tenuifolia</i>					
alder, red <i>Alnus rubra</i>					
alder, wavy leaf <i>Alnus viridis ssp. sinuata</i>					
alder, white <i>Alnus rhombifolia</i>					
alumroot, crevice <i>Heuchera micrantha</i>					
alumroot, meadow <i>Heuchera chlorantha</i>					
alumroot, roundleaf <i>Heuchera cylindrica</i>					
alumroot, smooth <i>Heuchera glabra</i>					
amole <i>Chlorogalum pomeridianum</i>					

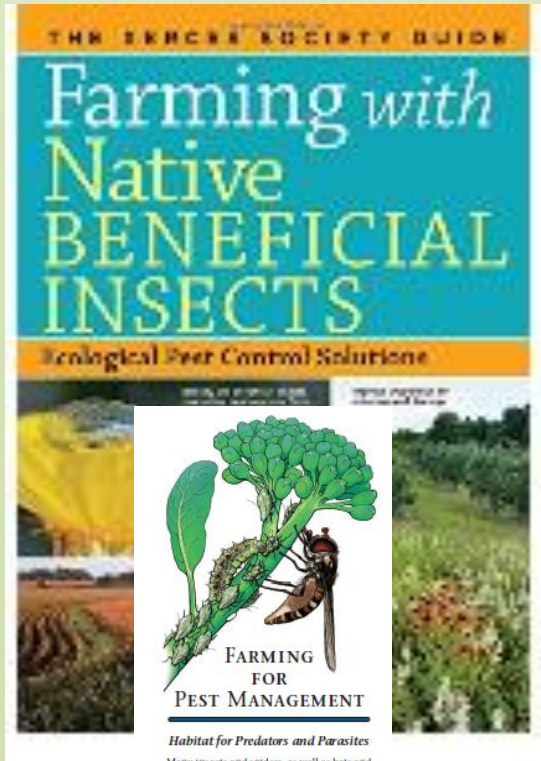
<http://www.oregonflora.org/gardening.php>



# Additional Resources

The Xerces Society for Invertebrate Conservation

[www.xerces.org](http://www.xerces.org)

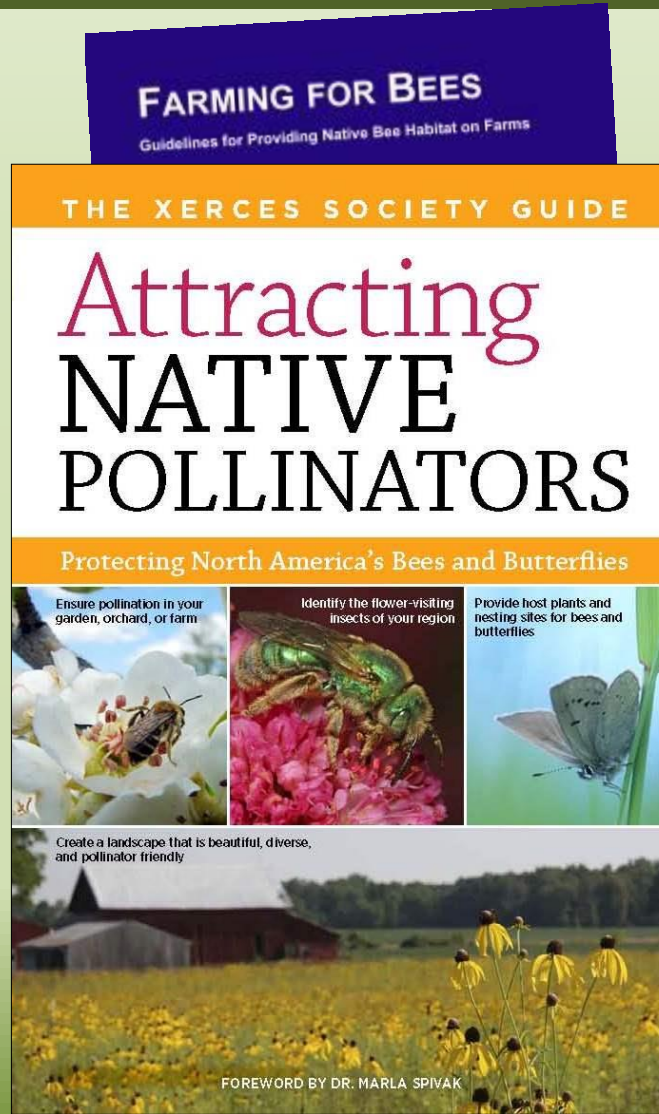


#### Habitat for Predators and Parasites

Many insects and spiders, as well as bats and birds, eat crop pests and weeds. Providing food and shelter for these useful animals can help suppress unwelcome pest species.

This brochure illustrates how farmers can attract and retain helpful predators and parasites by providing some of the key resources that they require. Many of these practices benefit pollination and other wildlife as well, and are eligible for support by Farm Bill programs.

Inside, you will find more information and a guide to help you manage your farmland for a wide variety of the beneficial insects that are the natural enemies of crop pests and weeds.



#### FARMING FOR BEES

Guidelines for Providing Native Bee Habitat on Farms

THE XERCES SOCIETY GUIDE

## Attracting NATIVE POLLINATORS

Protecting North America's Bees and Butterflies

Ensure pollination in your garden, orchard, or farm

Identify the flower-visiting insects of your region

Provide host plants and nesting sites for bees and butterflies

Create a landscape that is beautiful, diverse, and pollinator friendly

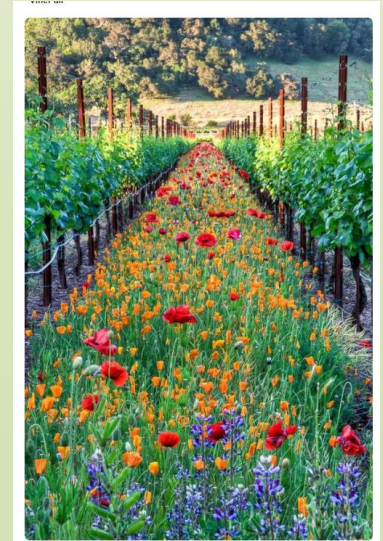
FOREWORD BY DR. MARLA SPIVAK





# Field Trial: Enhancing Pollinator/Beneficial Insect Habitat in Vineyards

- Fall of 2016 installed a pollinator enhancement to create beneficial insect habitat to help control mite and aphid pests.
- Purpose: to test the establishment and success of two seeding dates (early fall and late fall) and two seed mixes (diverse vs tough) planted between the grape rows.




California vineyard





# Audubon & East Multnomah Soil and Water Conservation District



ABOUT EMSWCD | IN YOUR YARD | ON YOUR LAND | GRANTS AND COST SHARE | LAND CONSERVATION | FARM INCUBATOR | NATIVE PLANTS | WORKSHOPS AND EVENTS

EMSWCD » Workshops and Events » Upcoming Workshops

← Workshops and Events

Upcoming Workshops >

Workshop Descriptions

Host a Workshop

List of all Events

Naturescaped Yard Tour

Short Presentations

Board, Committee and Budget Meetings

f t YouTube in g+ RSS

Upcoming Events


<< Apr 2017 >>

S M T W T F S

1 2 3 4 5 6 7 8 9 10 11 12

### Upcoming Workshops

**Discover ways to save time, money and energy on your property** through our FREE workshops. From naturescaping to livestock management, our classes help you care for your land in ways that benefit people, water, and wildlife.

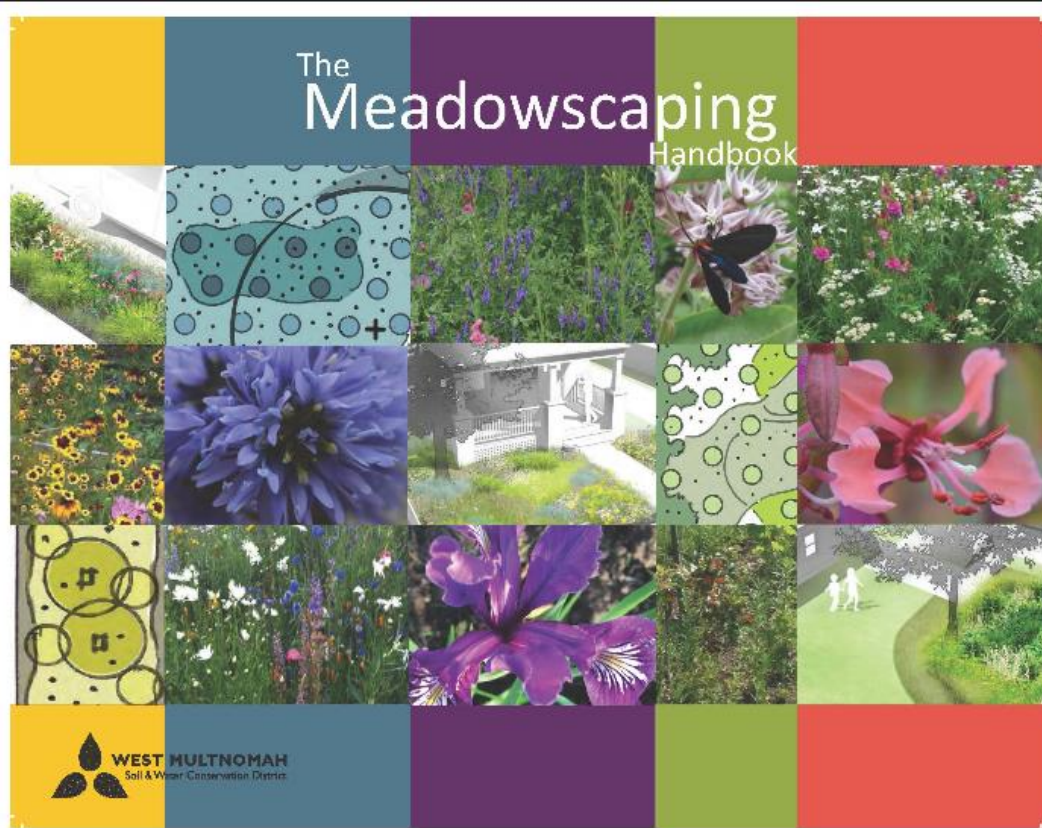


**Spring Workshops: Click on an Event Title to Register**

DATE & TIME	EVENT & LOCATION	AVAILABILITY
Sat, Apr. 8 9:00 am - 11:30 am	<a href="#">Attracting Pollinators to the Urban Garden</a> NE Portland Tool Library, Portland	Event full, wait list available.
Wed, Apr. 12 6:00 pm - 7:30 pm	<a href="#">Rural Weeds</a> Columbia Grange, Corbett	22 seats left (of 45 max)
Sat, Apr. 15 9:00 am - 11:30 am	<a href="#">Beneficial Insects</a> Livingcapse, Portland	5 seats left (of 30 max)
Wed, Apr. 19 6:30 pm - 9:00 pm	<a href="#">Native Plant Workshop</a> Charles Jordan Community Center, Portland	8 seats left (of 45 max)
Sat, Apr. 22 9:00 am - 1:00 pm	<a href="#">Naturescaping Basics</a> Livingcapse, Portland	Event full, wait list available.
Thu, Apr. 27 6:00 pm - 8:30 pm	<a href="#">Urban Weeds</a> Gresham City Hall, Gresham	35 seats left (of 45 max)
Sat, Apr. 29 1:00 pm - 3:30 pm	<a href="#">Beneficial Insects</a> Northeast Community Center, Portland	28 seats left (of 45 max)
Wed, May 3 6:30 pm - 9:00 pm	<a href="#">Attracting Pollinators to the Urban Garden</a> Livingcapse, Portland	20 seats left (of 30 max)
Thu, May 4	<a href="#">Native Plant Workshop</a>	36 seats left (of 45 max)



# Meadowscaping Project - West Multnomah Soil and Water Conservation District, West-side Portland



- “Meadowscaping” guide
- Demo sites with different species and establishment techniques
- Focus on native plants



Flying over farmland in northern California valley



*Perhaps a  
more  
sustainable  
(pollinator-  
friendly)  
agriculture  
could  
maintain  
biodiversity?*



Painting courtesy use from Xerces



# Questions?

**Kathy Pendergrass**

**Plant Material Specialist (Botanist Ecologist)**

**USDA-NRCS Portland Field Office**

**(503) 414-3266**

**[Kathy.pendergrass@or.usda.gov](mailto:Kathy.pendergrass@or.usda.gov)**



Pollinator meadow in bloom; dominant flowers are California poppies, baby blue eyes, Chinese houses, and golden lupine. (Photograph by Jessa Kay Cruz, The Xerces Society.)