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# Bees are key for producing native forb seed

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# Manageable Bees for Pollination

- Hived **honey bees**, if obtainable, useful for pollinating *Dalea*, *Crepis*, possibly *Cleome*, some *Penstemon*, *Hedysarum* and *Sphaeralcea*
  - **Alfalfa leaf-cutting bees** useful for some of the summer-blooming species, esp. *Dalea*
  - **Blue orchard bee** too early and/or not interested
  - **Other *Osmia*** are great pollinators for the legumes (*Hedysarum*, *Lupinus*, *Astragalus*), also *Penstemon*, *Balsamorhiza*, *Crepis*
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# Bee fauna at cultivated *P. eatonii*



1 honey bee/m row  
52 grains/stigma  
123-312 kg seed/ha

*Penstemon*  
pollinators?



# Managed bees for cultivated *Dalea*

- Stocking density
  - 1 strong hive/acre?



honey bees



- Warning- may focus foraging on most attractive bloom

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# Managed bees for cultivated *Dalea*



# Managed Bees for Pollination

- **Alfalfa leaf-cutting bees** useful for some of the summer-blooming species, esp. *Dalea*
- Not for bloom before mid-June, flies best when hot
- Stocking density? 1 gal. cells/acre



# Healthy populous bees cost more



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# Wild bee to manage for *Hedysarum*



*Osmia sanrafaelae*



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# *Penstemon speciosus*



# Bee fauna at wild at *P. speciosus*

<i>Ceratina</i>		1
<i>Dialictus</i>		1
<i>Eucera</i>	<i>edwardsii</i>	1
<i>Eucera</i>	<i>frater</i>	1
<i>Eucera</i>	<i>fulvitarsis</i>	1
<i>Evyllaesus</i>		1
<i>Hoplitis</i>	<i>hypocrita</i>	1
<i>Osmia</i>		9
<i>Osmia</i>	" <i>parkeri</i> "	2
<i>Osmia</i>	<i>brevis</i>	32
<i>Pseudomasaris</i>	<i>vespoides</i>	24

← Oligolectic



6 locations, 3 states

# Bee fauna at cultivated *P. speciosus*

wild



*Osmia brevis*

cultivated



*Bombus*

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up to 3400 seeds/raceme

# Wildflower Visitation by Bumblebees

Bombus	appositus	bifarius	californicus	centralis	fervidus	flavifrons	grisecollis	huntii	morrisoni	nevadensis	occidentalis	rufocinctus	sylicola
<b>Flower</b>													
<i>Astragalus filipes</i>		X	X	X	X			X		X			
<i>Balsamorhiza sagittata</i>													
<i>Crepis occidentalis</i>		X						?					
<i>Dalea ornata, searlsiae</i>					X			X	X	X			
<i>Hedysarum boreale</i>	X	X			X	X	X	X		X	X	X	
<i>Lomatium dissectum</i>													
<i>Lupinus argenteus</i>		X		X				X					X
<i>Penstemon speciosus</i>					X		X						
<i>Sphaeralcea</i>								x					

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# *Lomatium dissectum*



# Bee fauna at wild *L. dissectum*

<i>Andrena</i>	spp.	73	
<i>Apis</i>	<i>mellifera</i>	0	← Oligolectic
<i>Micrandrena</i>	<i>microchlora/chlorogaster</i>	52	←
<i>Dialictus</i>	spp.	2	
<i>Evyllaeus</i>	spp.	1	
<i>Halictus</i>	<i>tripartitus</i>	0	
<i>Nomada</i> *	spp.	4	
<i>Osmia</i>	<i>kincaidii</i>	1	

\* *Andrena* cleptoparasite

11 locations, 4 states

# Bee fauna at cultivated *L. dissectum*

wild



*Micrandrena*

cultivated



*Halictus*

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# Seed production at cultivated *L. dissectum*



# Bee fauna for cultivated *Dalea* – generalists all



# Multiplying versatile wild bees: *Anthophora*



# Multiplying specialist wild bees: *Diadasia*



Deliver 33-45  
pollen grains  
per stigma



## Colonized sites seen

- Malheur Exp Sta
- Lucky Pk Nursery
- USU common garden
- USU campus demo garden



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# Bees for Native Forb Pollination

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  - **Other *Osmia*** are great pollinators for the legumes (*Hedysarum*, *Lupinus*, *Astragalus*), also *Penstemon*, *Balsamorhiza*, *Crepis*
  - **Stewardship of wild bees that you can't manage** (*Penstemon speciosus*, biscuitroots, globemallows)  
May multiply on other forbs you're producing
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