

Pollination Needs and Promising Pollinators for Great Basin Forbs

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Native forb seed is desired to rehabilitate and restore burned or degraded public lands in the Intermountain West. The BLM annually buys and plants 3-6 million pounds of seed for the Great Basin alone; 85% has been grass and shrub, but <1% native forbs. Only farming can produce tons of affordable native forb seed, one objective of this 5-year research initiative funded by the BLM and USFS.



A key factor for the success of this project is **pollination**. Native bees, a pollen wasp, and/or honey bees are needed to pollinate most of these candidate forb species. Most of the native pollinators are unmanageable ground-nesting species, but among them are non-social, native, cavity-nesting species with management potential.

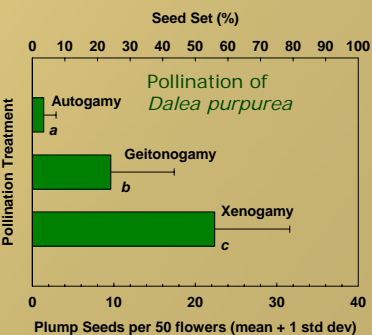
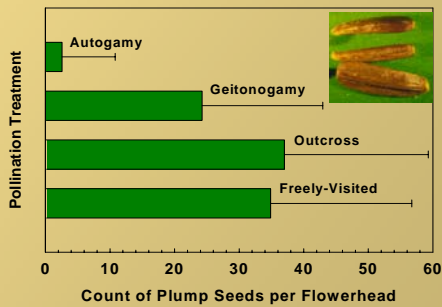


Osmia bee larvae devour their individual provisions of pollen and nectar



If successful, then more diverse, affordable and native revegetation seed will be restored to degraded or burned federal lands of the region. Participating farmers will profit from a more diversified crop portfolio and be linked to conservation applications. Native bees and other pollinators of the Great Basin could directly benefit from these restoration efforts, as their native pollen and nectar plants will be vastly increased.

Seed Count of Treated Flowerheads of *Balsamorhiza sagittata*



Names		Progress with Pollination and Pollinators
Latin	Common	
<i>Astragalus filipes</i>	threadstem milkvetch	Shares pollinating bees with <i>Hedysarum</i> , esp. <i>Osmia</i> . Pollination experiments planned for 2005
<i>Balsamorhiza sagittata</i>	arrowleaf balsamroot	Self-fertile, outcrossing yields 40% more seed. Population of its specialist bee, <i>Osmia californica</i> , in management
<i>Cleome lutea</i>	Nevada bee plant	Self-fertile, outcrossing improves seed set, 1-3 lbs seed possible/plant. Avidly visited for nectar by bees & wasps
<i>Cleome serrulata</i>	Rocky Mtn. bee plant	Self-fertile, outcrossing triples seed set, 2-4 lbs seed possible/plant. Avidly visited for nectar by bees & wasps
<i>Crepis acuminata</i>	tapertip hawksbeard	Asexual, outcross for > genetic diversity, hosts manageable <i>Osmia/Megachile</i> species, populations of 2 spp in mngmt
<i>Dalea purpurea</i>	purple prairie-clover	Self-fertile, no seeds without bees, outcrossing doubles seed set. Surrogate for <i>D. ornata</i> , which will be studied in 2005
<i>Eriogonum umbellatum</i>	sulphur buckwheat	Visitors infrequent (e.g. 1 bee every 150 plants surveyed), but pollinators beneficial (8x less seed without visitors)
<i>Hedysarum boreale</i>	northern sweetvetch	Self-fertile, no bees no pods. Abundant, diverse bee fauna, some mngmt potential. Managed <i>Osmia lignaria</i> prospers
<i>Lomatium dissectum</i>	giant biscuitroot	4 species specialist <i>Andrena</i> bee, all unmanageable ground-nesters. Grow near native populations?
<i>Lupinus argenteus</i>	silver lupine	Self-infertile, shares pollinating bees with <i>Hedysarum</i> . Some <i>Osmia</i> and <i>Megachile</i> with management potential
<i>Penstemon speciosus</i>	showy beardtongue	Seedless capsules without pollinators, specialist pollinators (bee, wasp) requisite. Grow near native populations?



- ### Research components
- Learn forb breeding biologies, pollination needs
 - Survey for candidate pollinators, focus on bees
 - Compare pollinator efficiencies and abundances
 - Trap-nest wild bees, increase captive populations
 - Develop effective, practical, management systems

