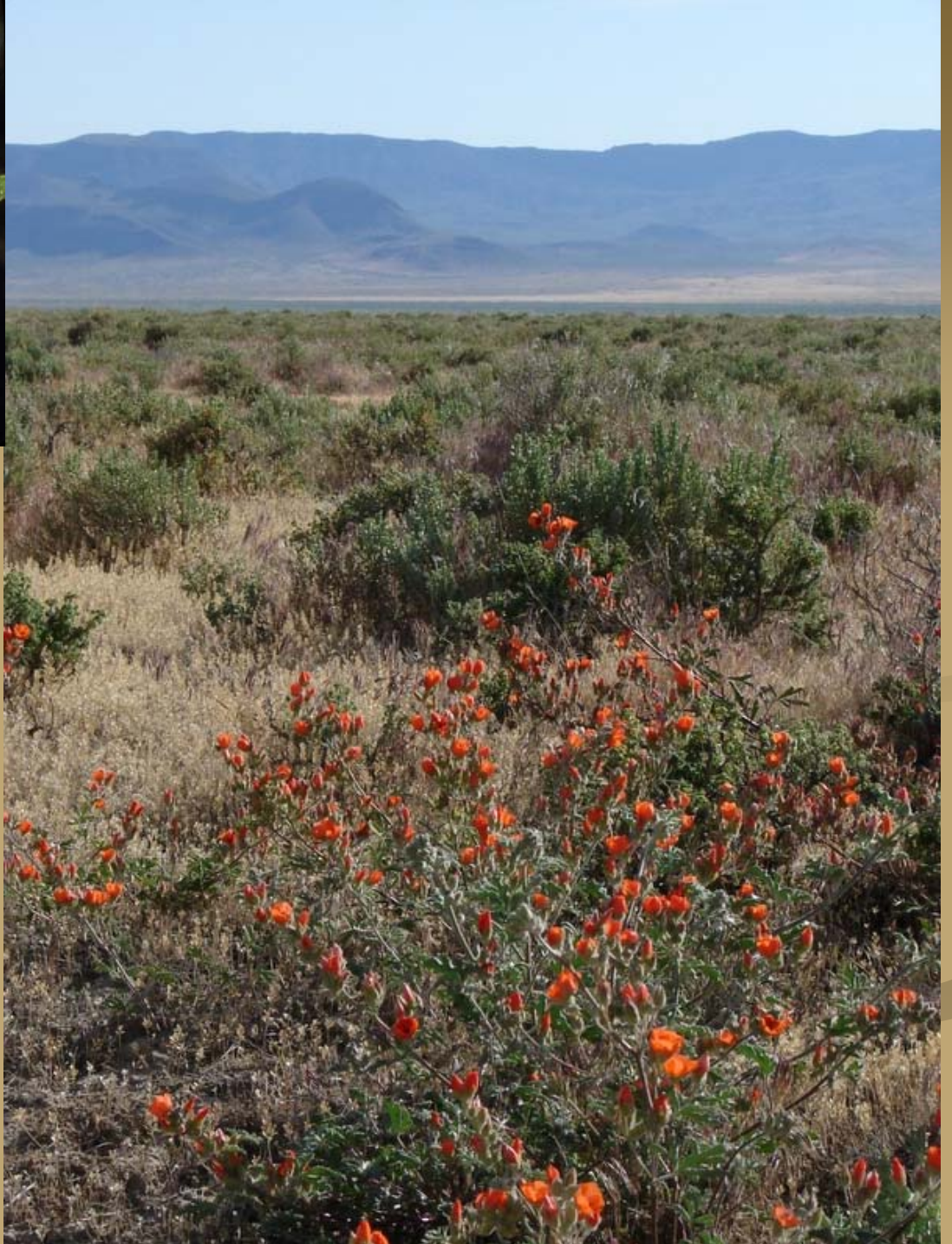


Jim Cane
USDA-ARS Bee Biology Lab
Utah State University
Logan, UT 84322

Astragalus filipes milkvetch*
Balsamorhiza sagittata balsamroot
Cleome lutea bee plant
Cleome serrulata bee plant
Crepis acuminata hawksbeard
Dalea ornata, searlsiae prairie-clover*
Eriogonum umbellatum buckwheat
Hedysarum boreale sweetvetch*
Lomatium dissectum biscuitroot
Lupinus argenteus, sericeus lupine*
Penstemon speciosus beardtongue
Sphaeralcea munroana, grossularifolia
globemallow

Lupinus





Sphaeralcea

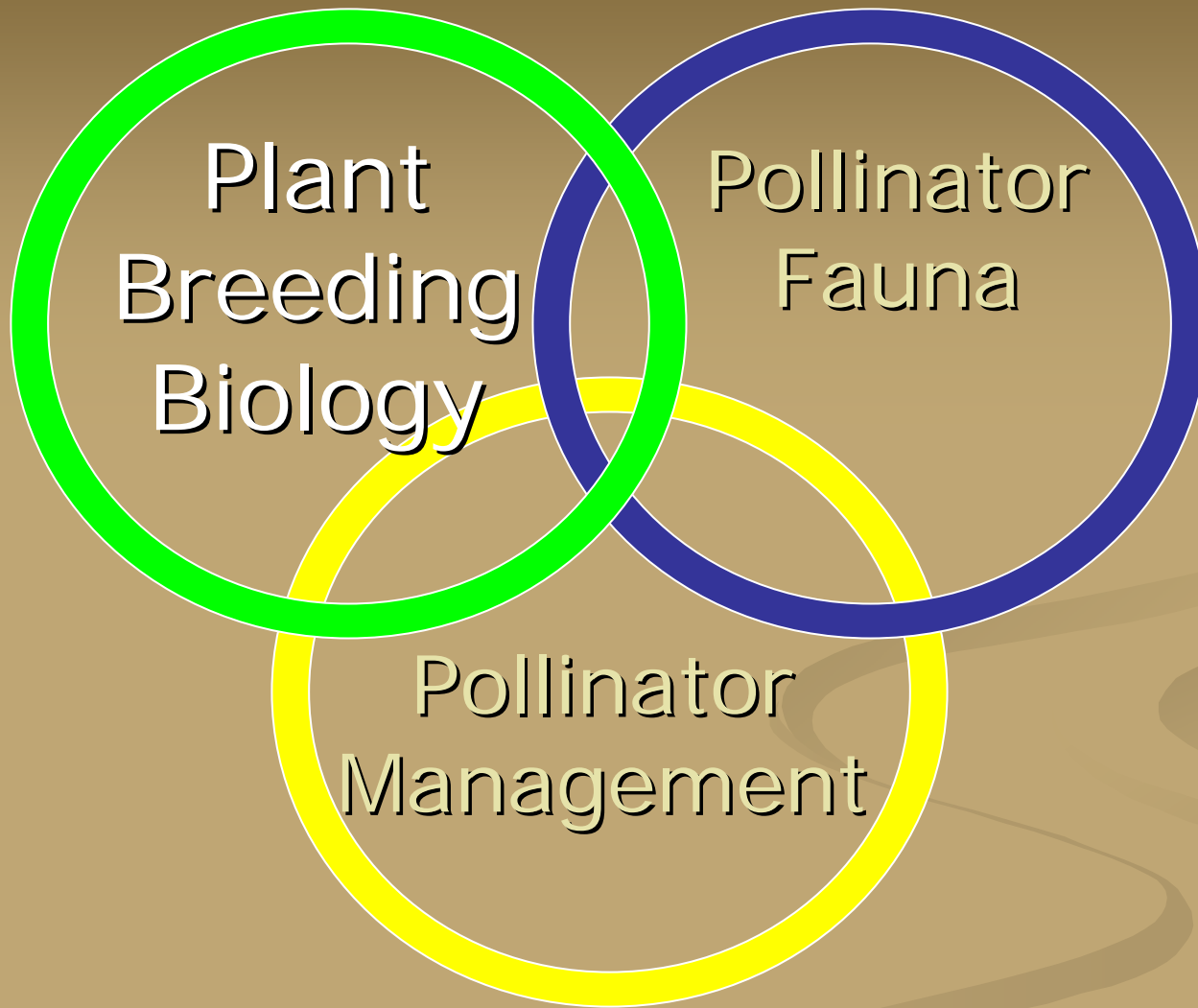


Dalea



Astragalus





Plant
Breeding
Biology

Pollinator
Fauna

Pollinator
Management



Cleome lutea



Lomatium dissectum

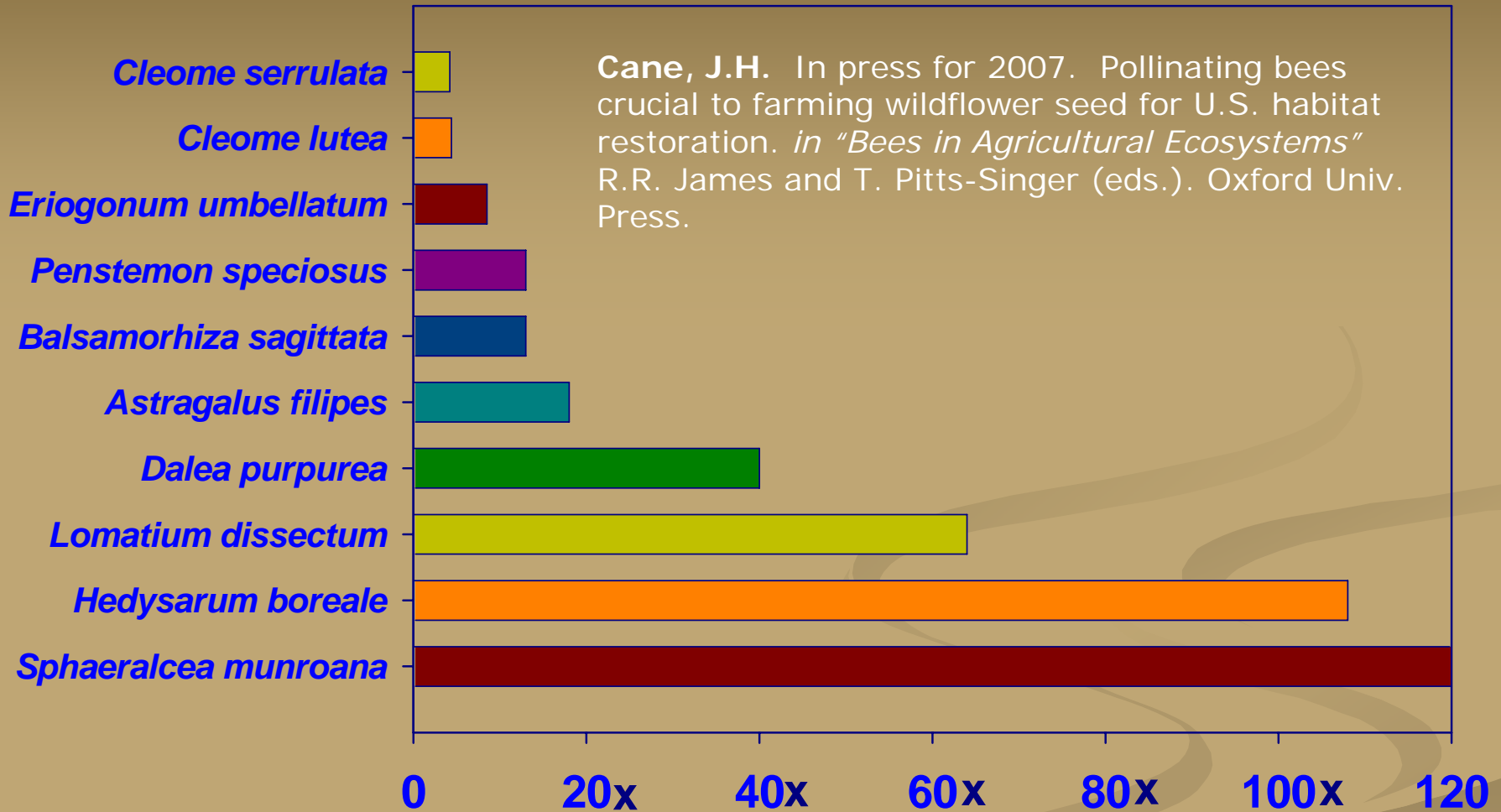
Pollinator
Need



some mechanical or
passive pollination

Pollinator
essential

Cane, J.H. In press for 2007. Pollinating bees crucial to farming wildflower seed for U.S. habitat restoration. in *"Bees in Agricultural Ecosystems"* R.R. James and T. Pitts-Singer (eds.). Oxford Univ. Press.



Reproductive Gain With Pollinators

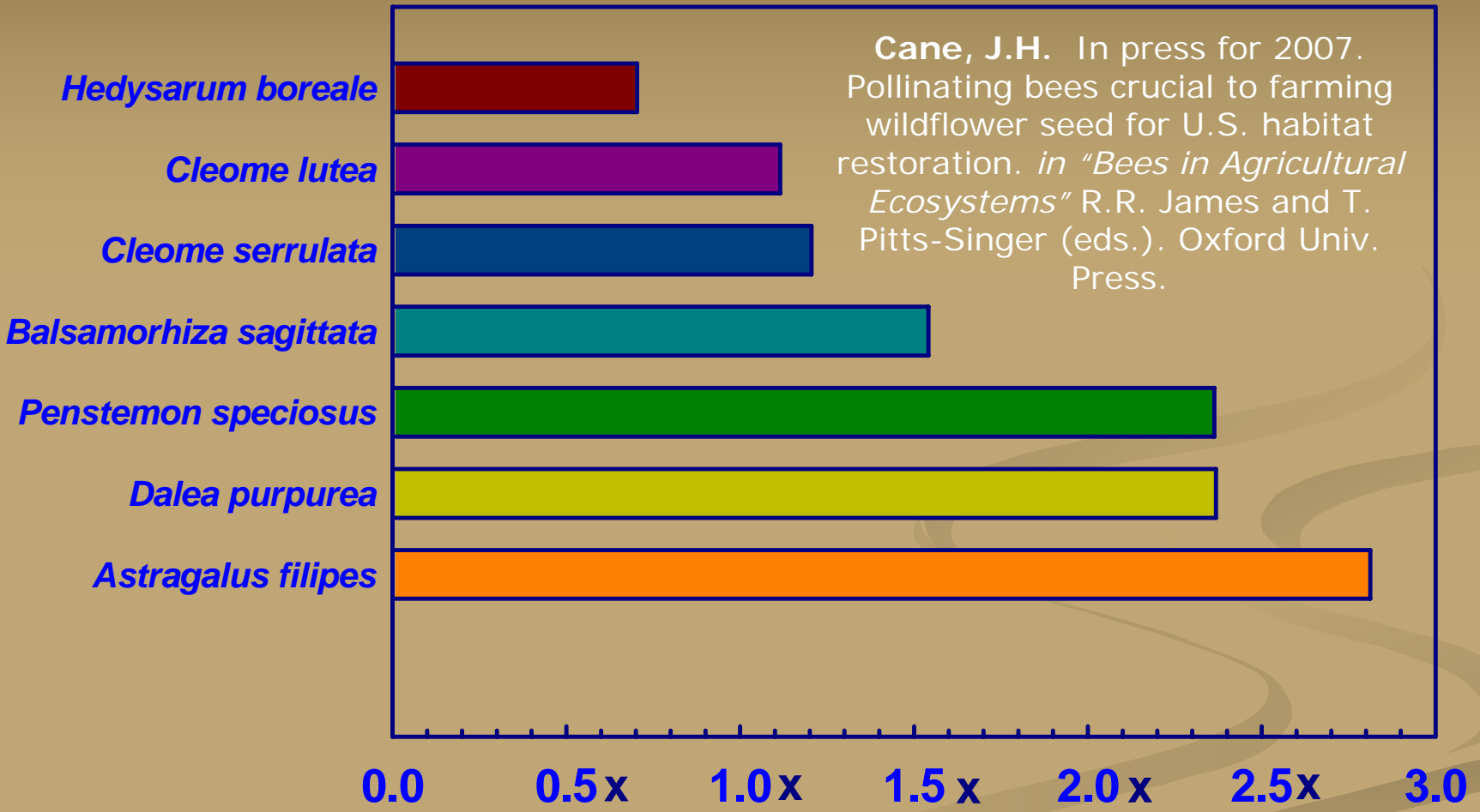
Outcrossing Advantage



Self-fertile

Self-incompatible





Cane, J.H. In press for 2007. Pollinating bees crucial to farming wildflower seed for U.S. habitat restoration. in "Bees in Agricultural Ecosystems" R.R. James and T. Pitts-Singer (eds.). Oxford Univ. Press.

Reproductive Gain With Cross-Pollination

Plant
Breeding
Biology

Pollinator
Fauna

Pollinator
Management

Pollinator Diversity



Restricted

Diverse

5 species
All *Andrena*

32+ species
Osmia (19 spp.)

Pollinator Specialization



Sphaeralcea munroana



Hedysarum boreale

Specialists

Generalists

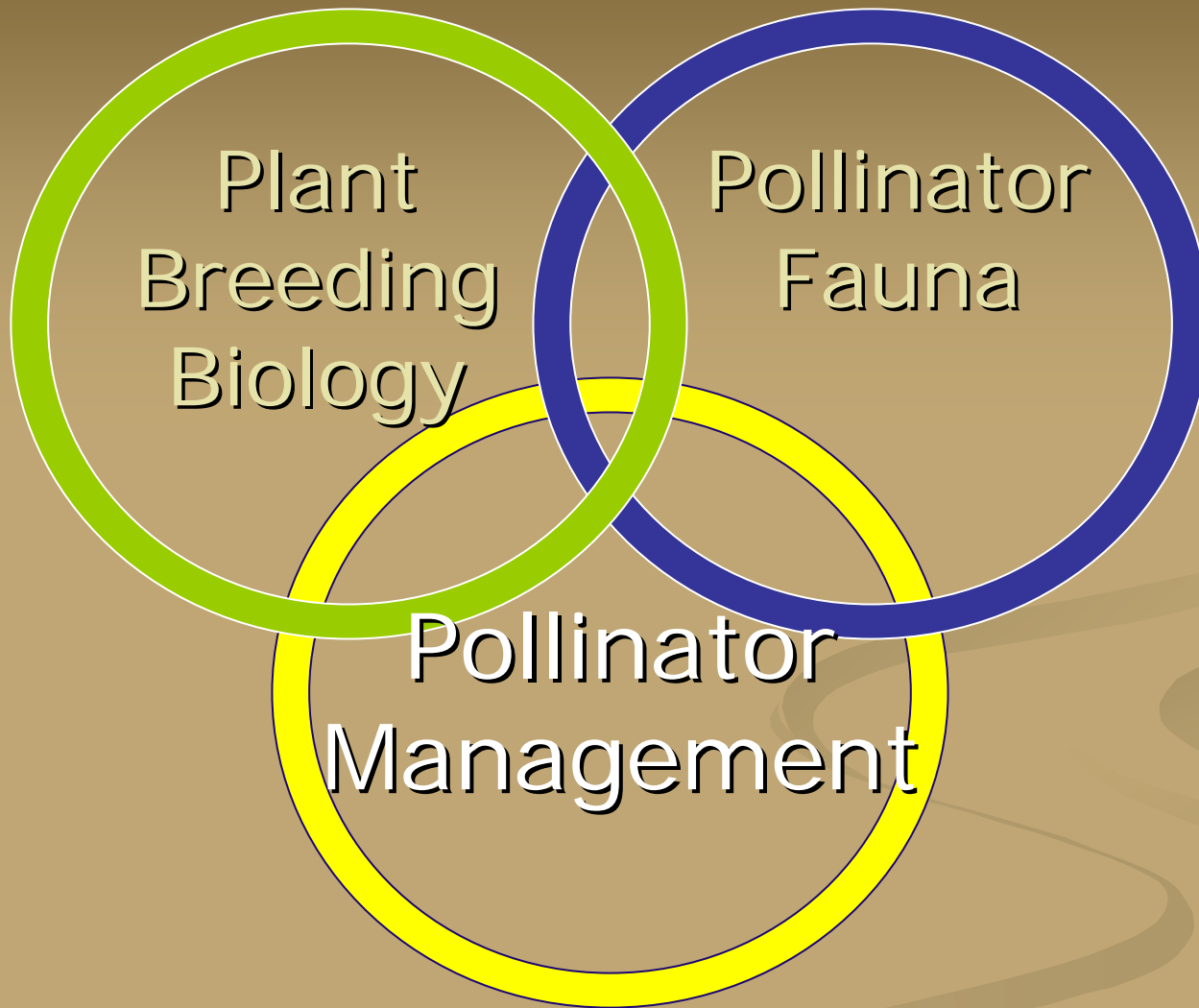


65% specialists

- Diadasia diminuta*
- D. lutzii*
- Colletes sphaeralcea*
- ...and 20 sp. generalists

100% generalists

- Bombus* (5 spp)
- Osmia* (16 spp.)
- Megachile* (1 sp.)
- Hoplitis* (3 spp.)



Plant
Breeding
Biology

Pollinator
Fauna

Pollinator
Management



*Lomatium
dissectum*



*Dalea
ornata*

No manageable
pollinator

Pollinator
choices

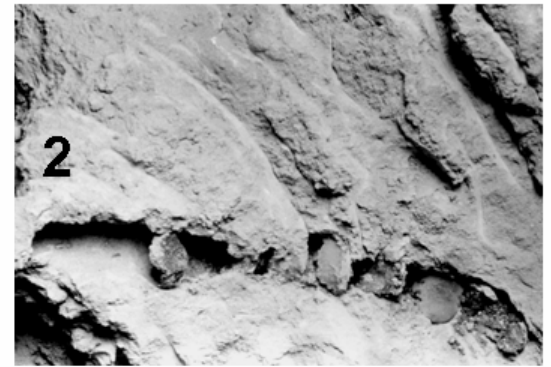
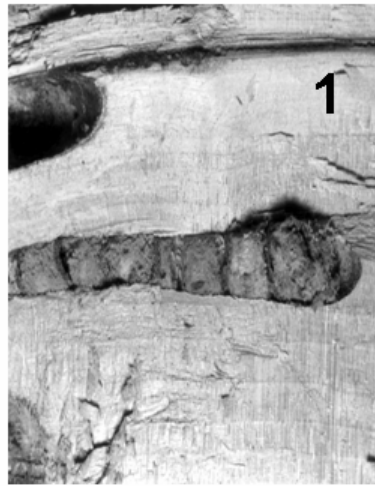


5 ground-nesting
Andrena



Nesting habits NA *Osmia* bees

- 139 native species
- 65 known nesting
- 73% cavity-nesters





Cane, J. H. 2006. The Logan BeeMail shelter: a practical, portable unit for managing cavity-nesting agricultural pollinators. *American Bee Journal*. 146(7): 611-613.



Osmia bruneri

- western distribution
- single mid-late spring generation
- nest using shelters, foam substrates
- pollinate, prosper on legumes
- pop increase 2-4x annually
- overwintering hundreds

Osmia sanrafaelae

Mechanical or
passive pollination

Pollinator
essential

Self-fertile

Self-incompatible



Restricted

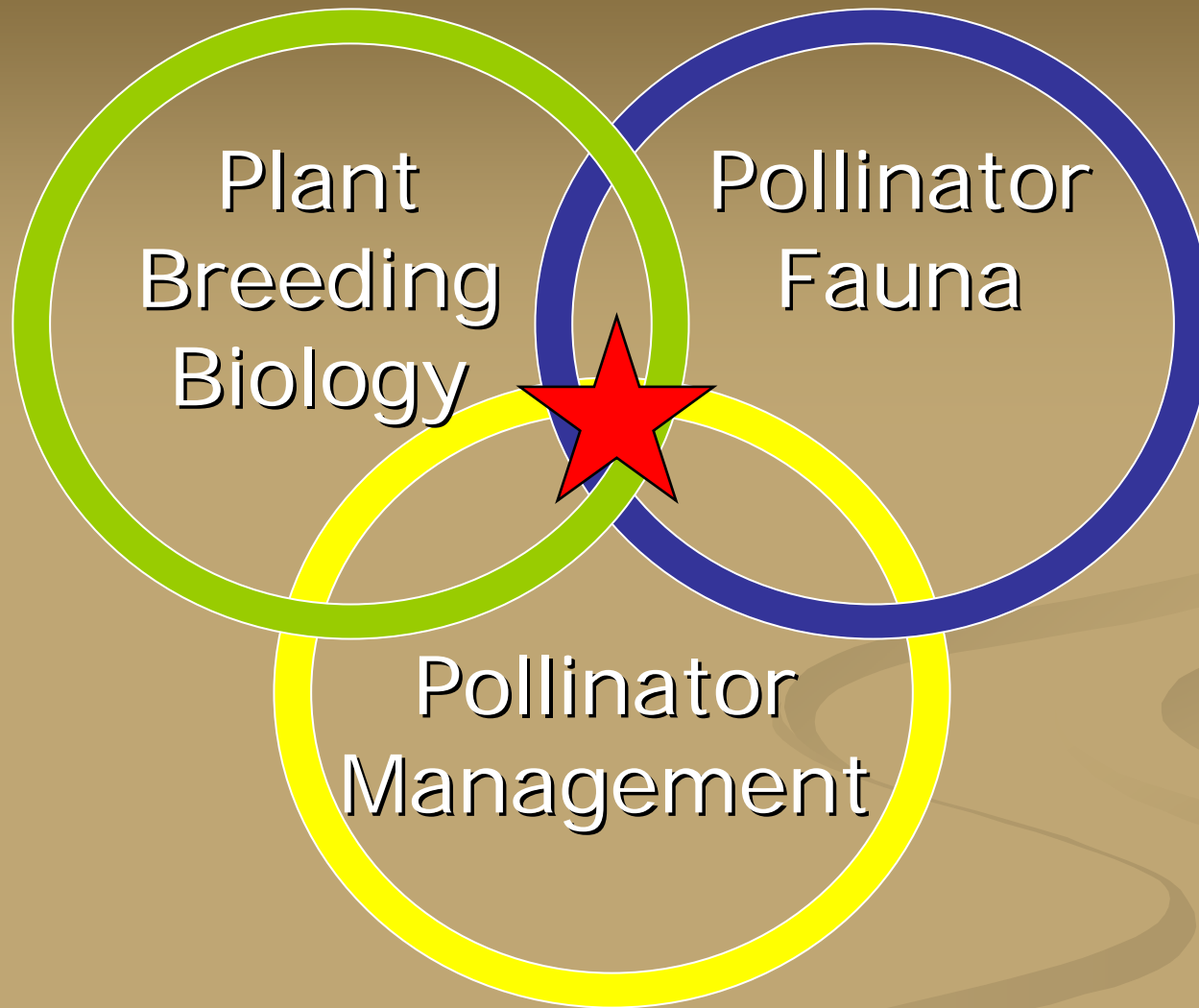
Diverse

Specialists

Generalists

No manageable
pollinator

Pollinator
choices



Plant
Breeding
Biology

Pollinator
Fauna

Pollinator
Management



RESERVE NOTE

THE UNITED STATES OF AMERICA



FB 85888442 A

5

5

