

EVALUATING EFFECTS OF POLLEN QUALITY ON HONEY BEE PHYSIOLOGY, COLONY GROWTH, AND IMMUNOCOMPETENCE



Ramesh Sagili & Carolyn Breece

Department of Horticulture

Oregon State University

Honey bee nutrition

- ⦿ Nutritional stress or poor nutrition – one factor in colony losses.
- ⦿ Nutrition is the first line of defense.

Why is pollen so important?

- ◉ Pollen is the primary source of protein.
- ◉ Nutrition (especially protein) is crucial when the colonies are rearing winter bees
- ◉ Vitellogenin- longevity of individuals
- ◉ Sterols, lipids, vitamins, minerals

Pollen Utilization



Pollen Forager



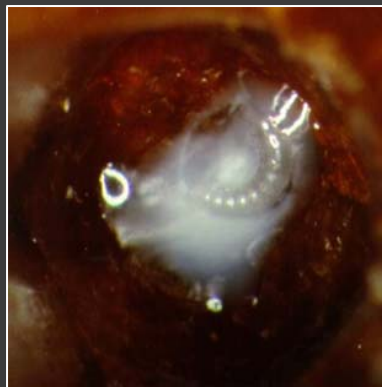
Stored Pollen



Nurse Bee



Hypopharyngeal Gland



Larva in pool of brood food

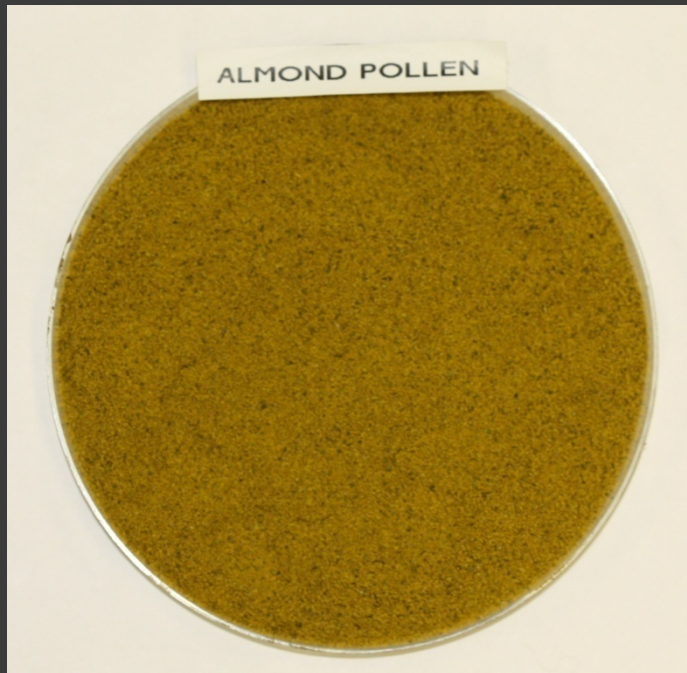
- Monoculture and loss of habitat have restricted the diet of honey bees.

Objective

- Evaluating effects of pollen quality on honey bee physiology, colony growth, and immunocompetence.

Materials & Methods

Pollen Sources





www.pacificcrestapiaries.com

Pollen trap



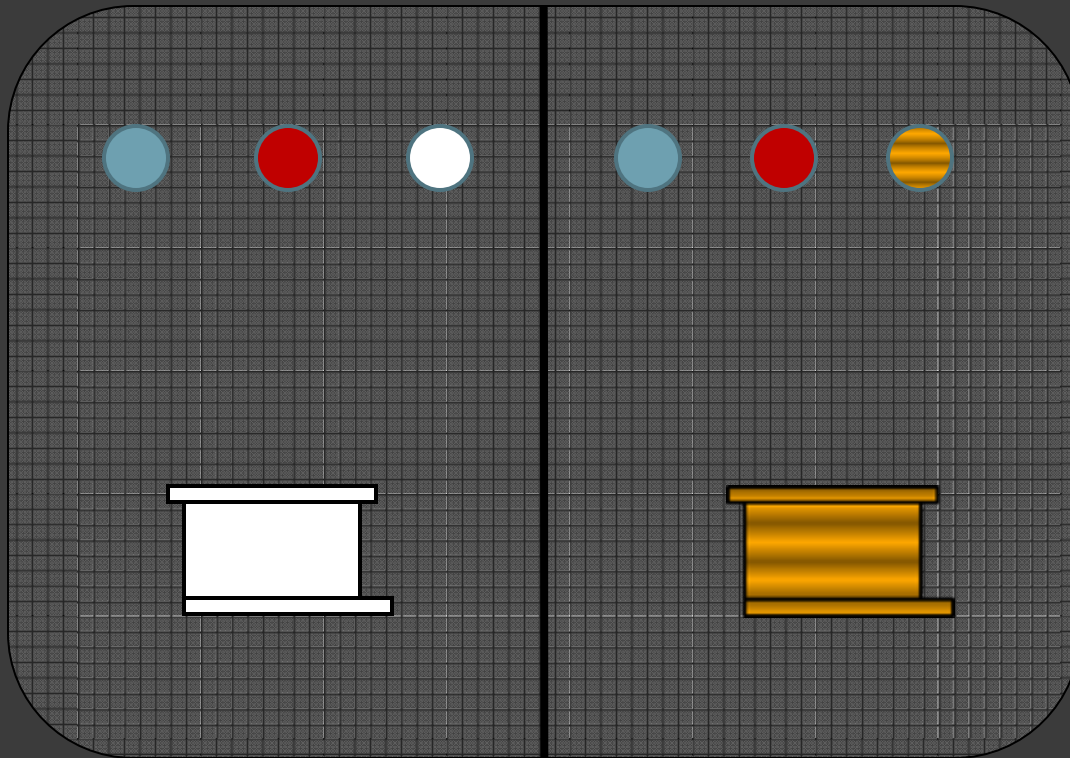
Flight cage



Materials and methods

Single Source
Pollen

Multiple Sources
Pollen



- Water
- 40% sucrose
- Single source pollen
- Multi-source pollen

Measurements

- Brood area – 7 wks
- HP gland protein
- Bee mass
- Lipid content

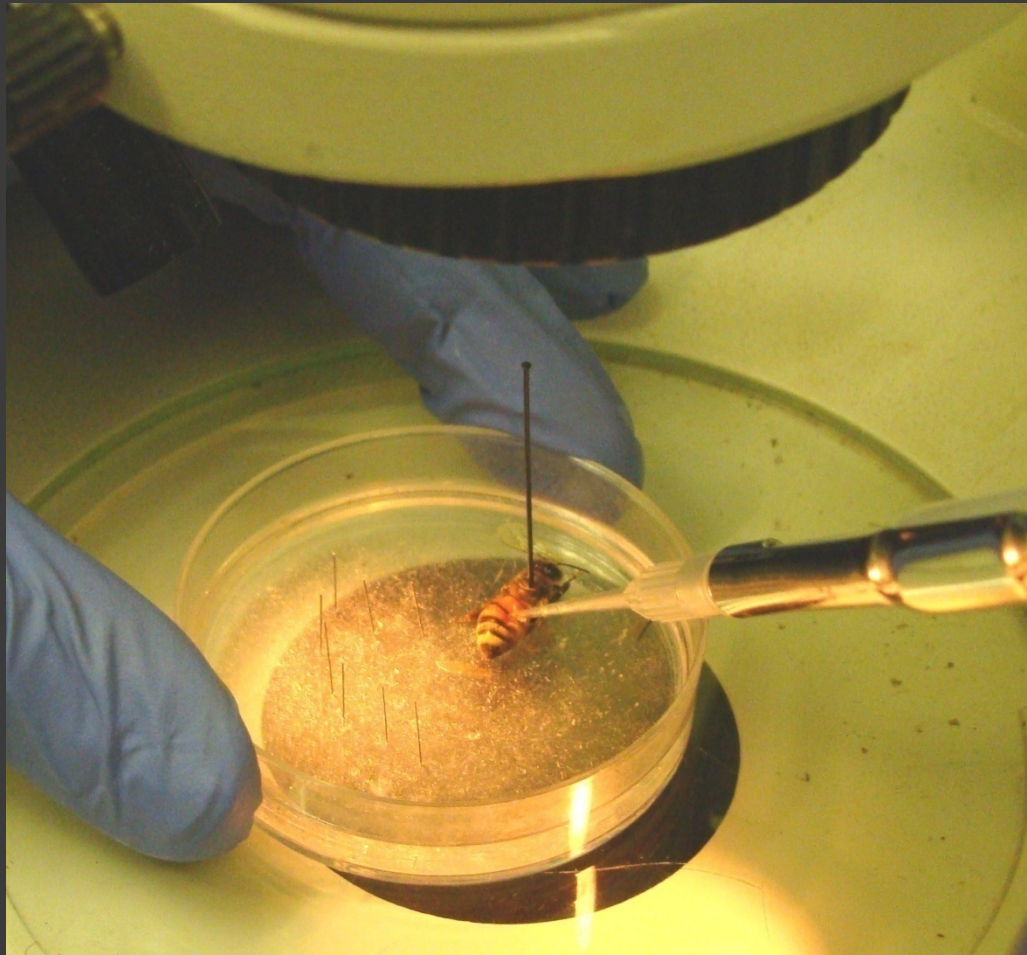
Divided Flight Cage
Controlled Foraging Environment





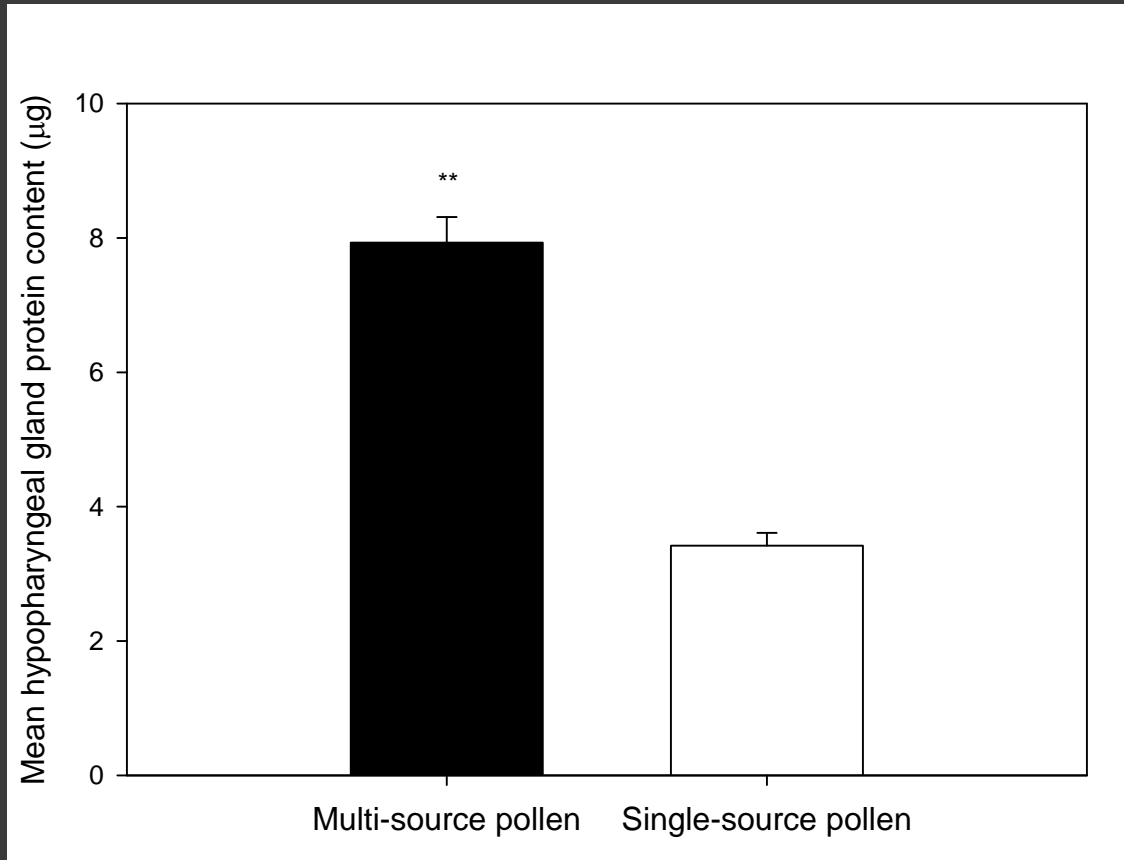
Immunocompetence

- ① Hemocytes
- ① Phenoloxidase / Prophenoloxidase

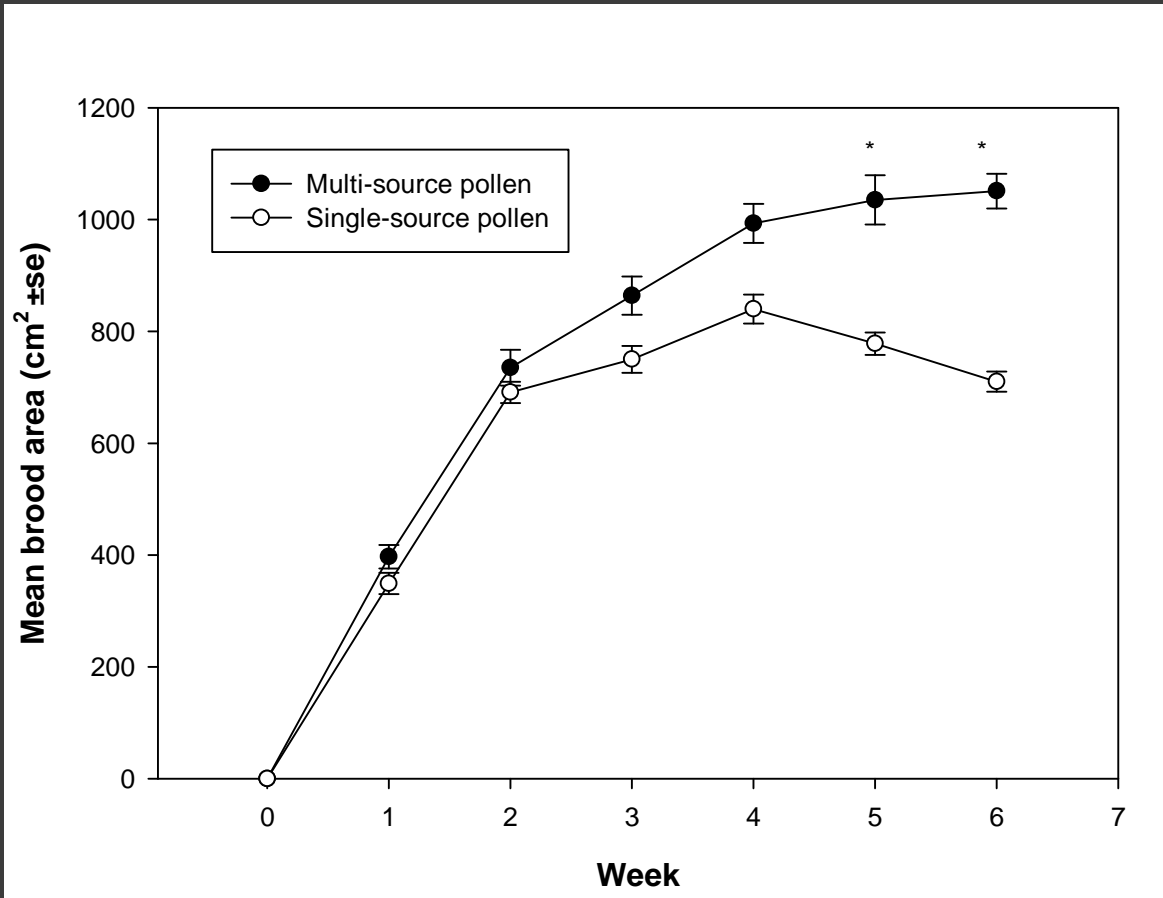


Results

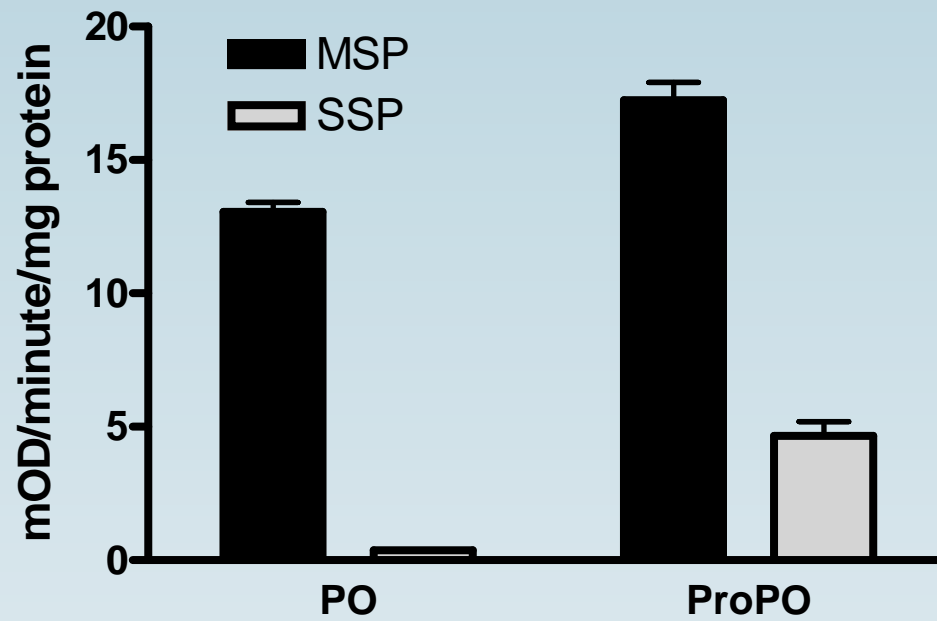
Mean hypopharyngeal gland protein content



Mean brood area



Phenoloxidase & Prophenoloxidase



Acknowledgements

- NAPPC
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