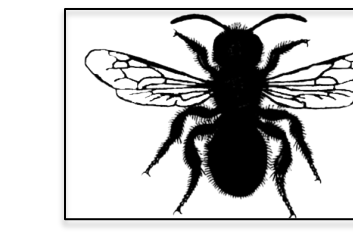


# Effects of agriculture on evolution of native species

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= the take-home message

## The Idea

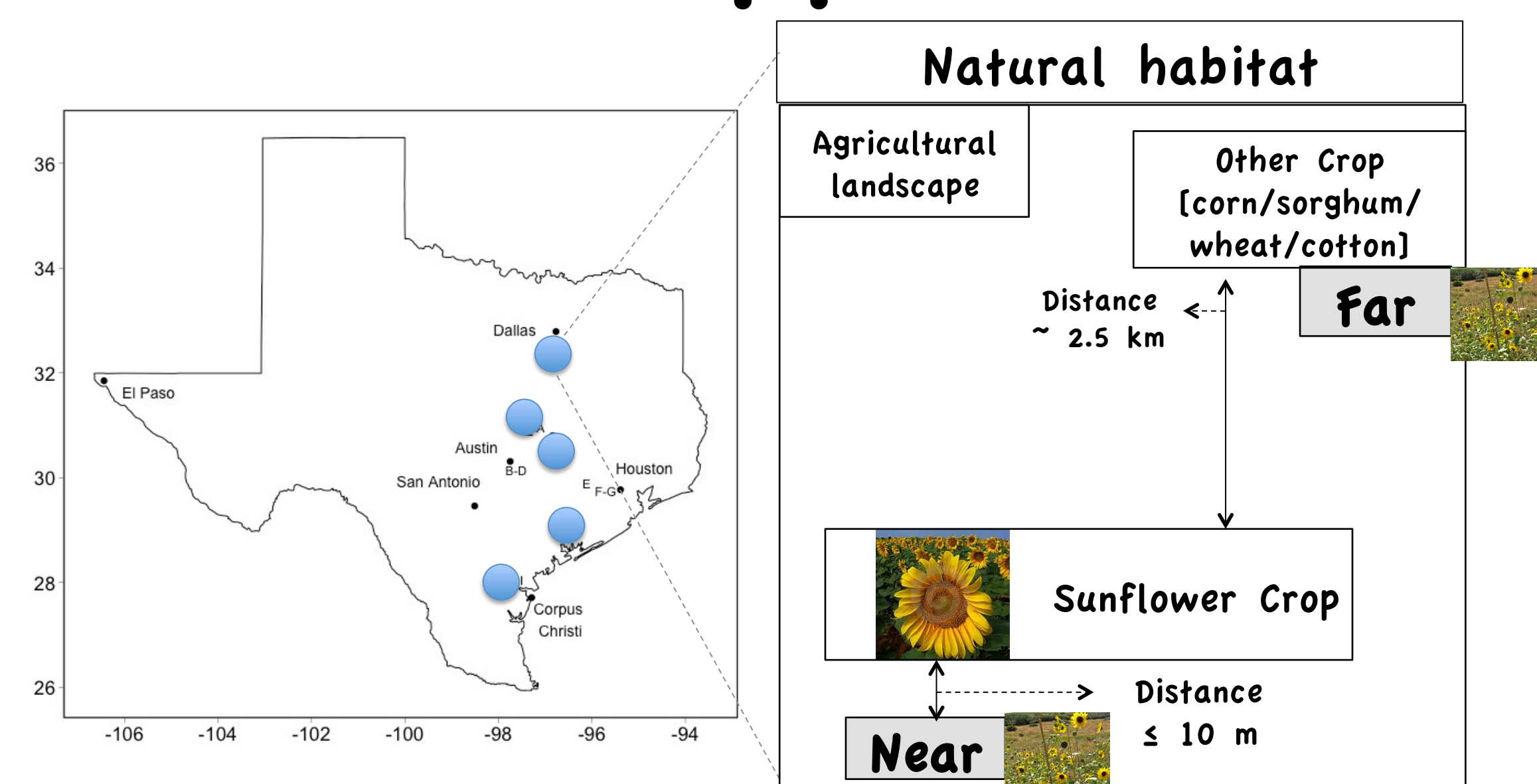
- Agriculture covers ~50% of vegetated land surface
- Evolution is altered in agricultural landscapes
  - Gene flow occurs from crops to wild relative plants
  - Evolution of resistance occurs in plants to GMOs
  - Evolution of plants/insects to herbicides/pesticides
- Yet, we know less of how natural selection is altered in agricultural landscapes through species interactions
- There is much evidence for altered biotic communities
- How do changes in abundance and community structure of mutualists and antagonists near sunflower crops alter natural selection on flower traits in wild sunflowers?

## The Questions

Does proximity to crops alter:

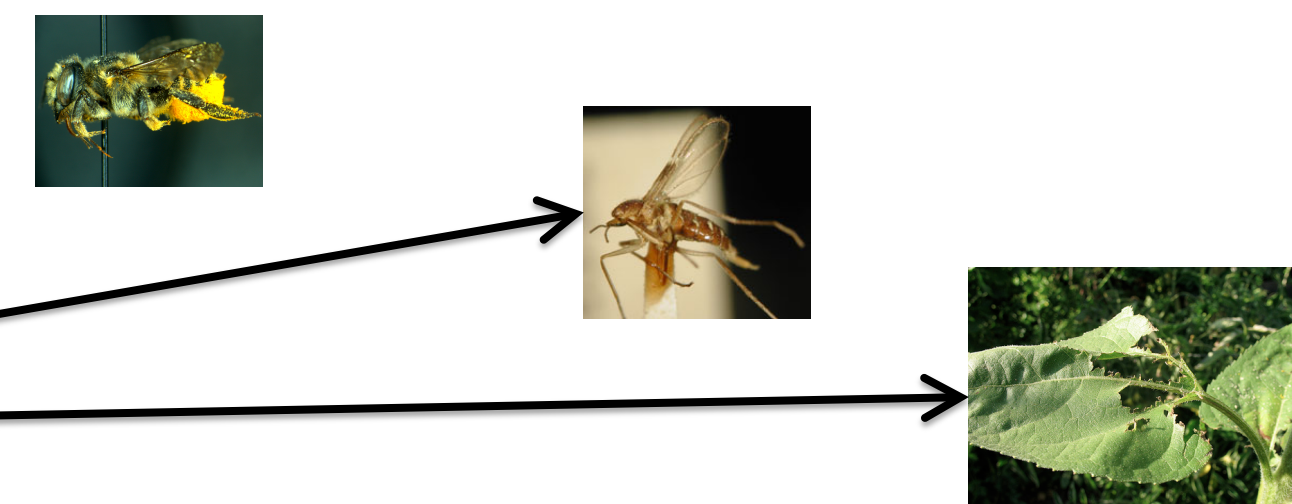
1. Abundance of mutualists and antagonists?
2. Community structure of mutualists and antagonists?
3. Selection on native plant floral traits?
4. Contribution of mutualists and antagonists to selection on native plant floral traits?

## The Approach



### Data Collected

- Pollinators: pollinator observations
- Seed predators: counted damaged seeds
- Folivores: leaf damage



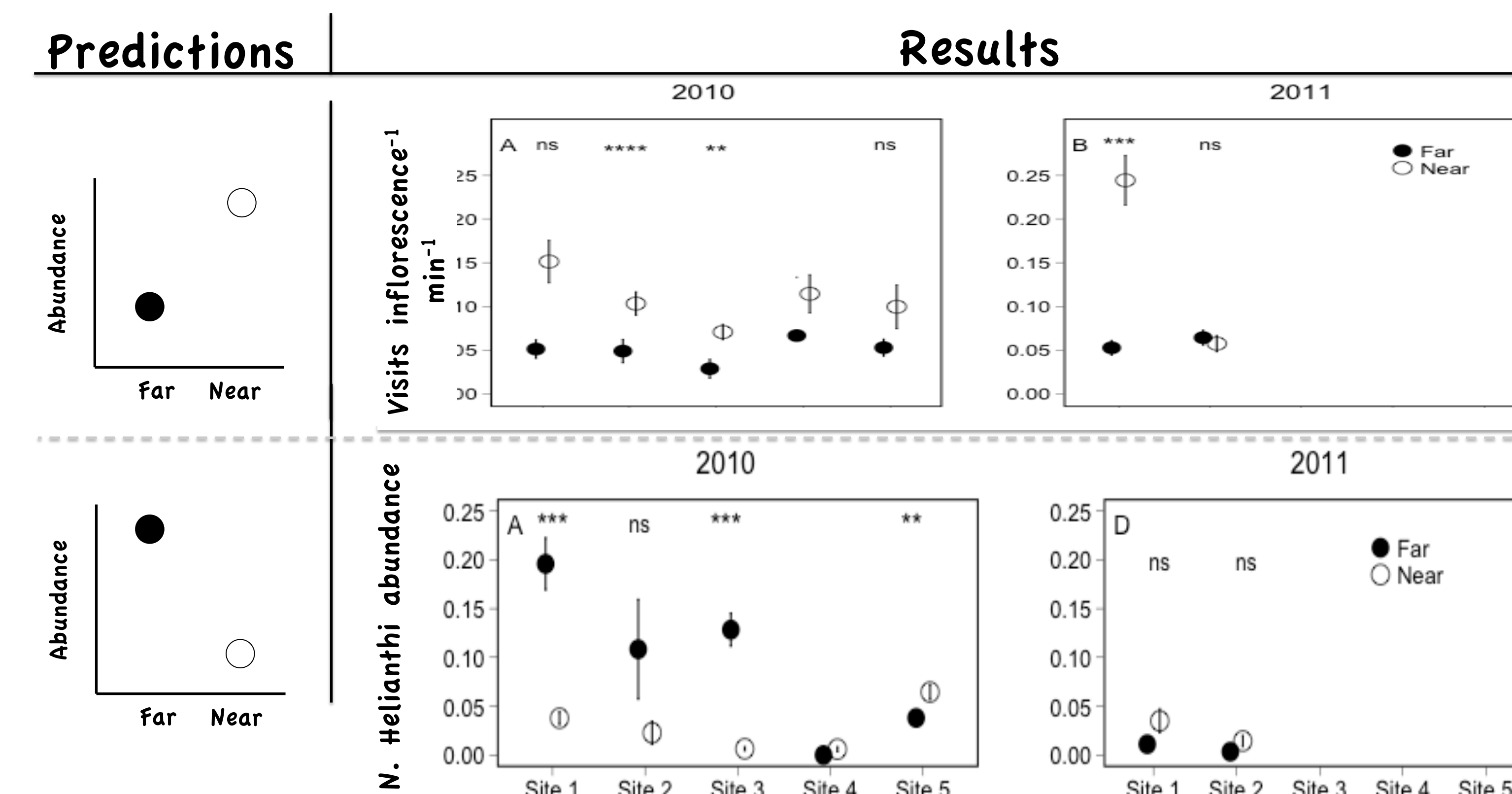
## What did we find?

Does proximity to sunflower crops alter:

1. ...abundance of mutualists and antagonists?



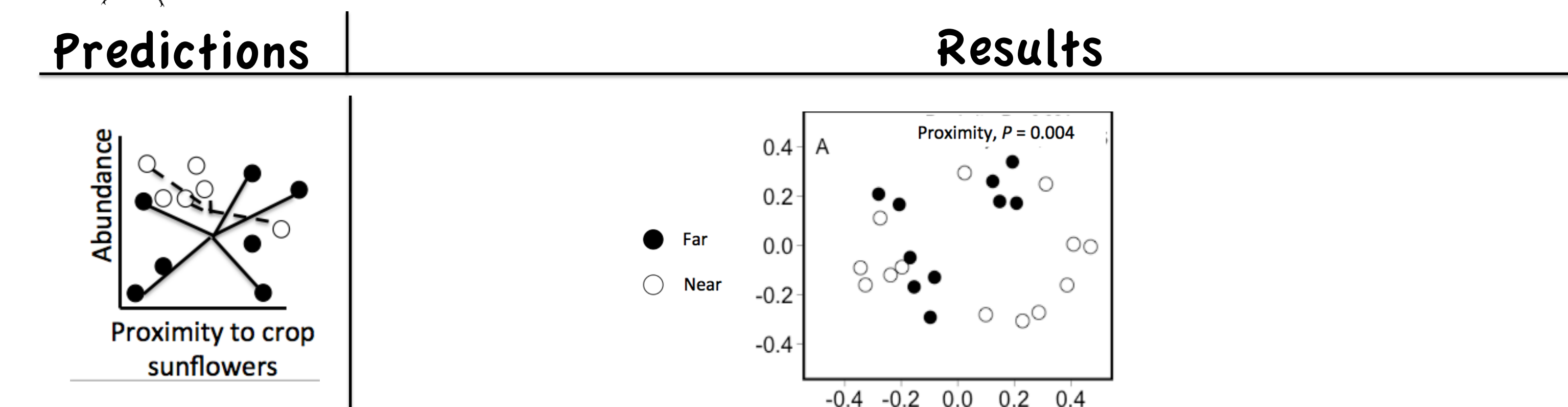
Mutualists more abundant near, antagonists more abundant far from crops



2. ...community structure of mutualists and antagonists?



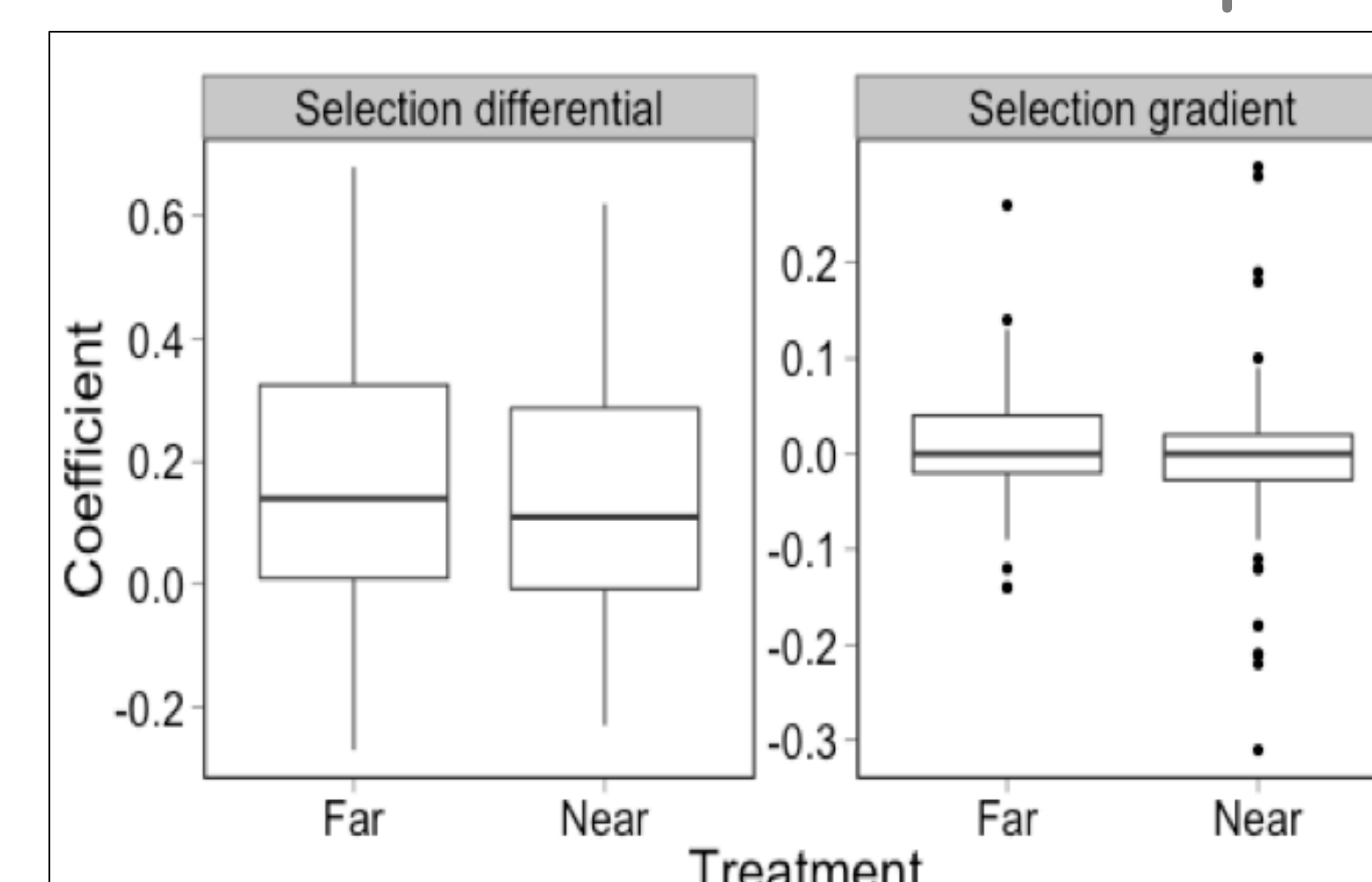
Beta-diversity of mutualists greater near crops



3. ...selection on native plant floral traits?



Natural selection altered by proximity to sunflower crops, and more variable near sunflower crops



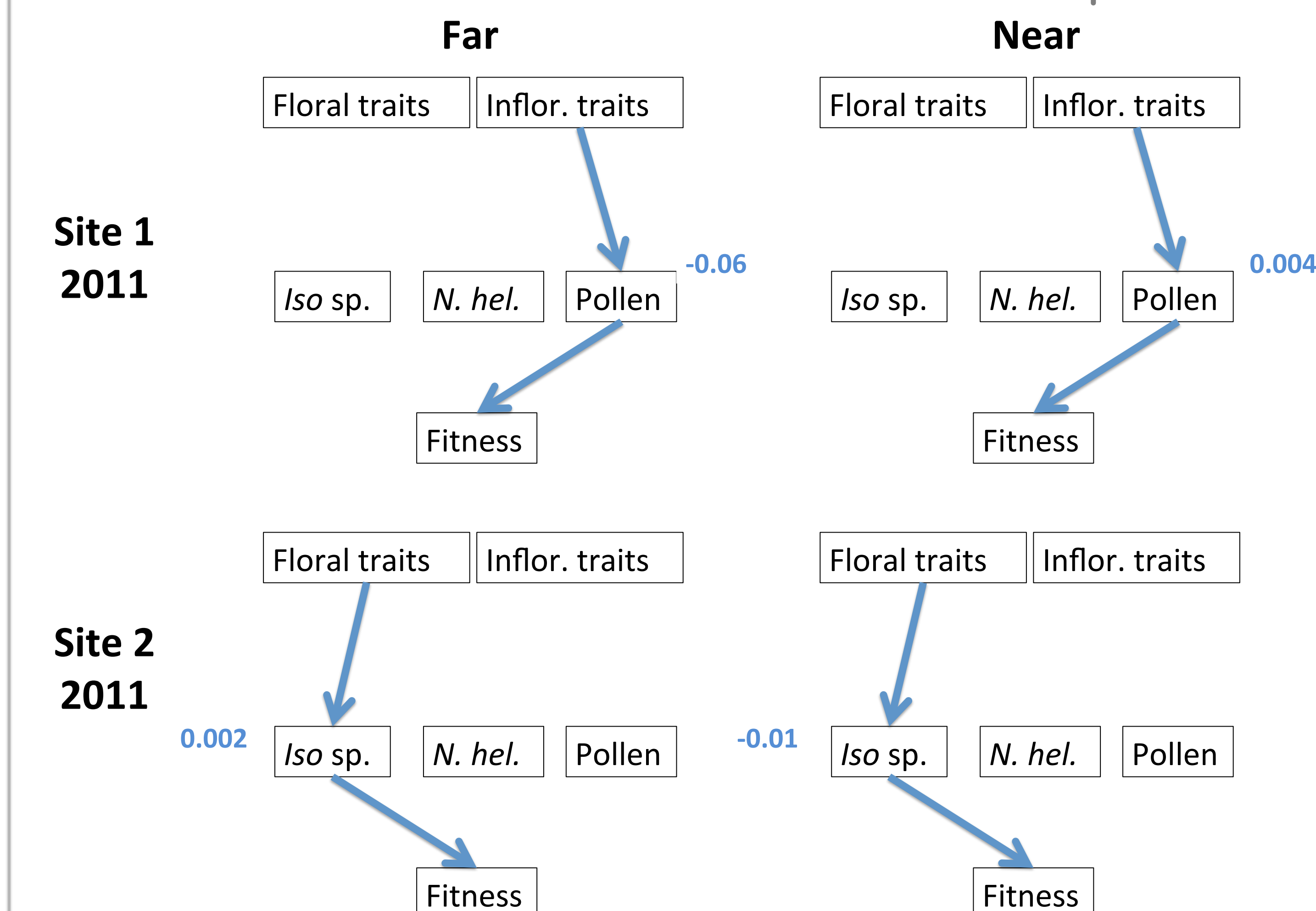
## ...what did we find?

Does proximity to sunflower crops alter:

4. ...contribution of mutualists and antagonists to selection on native plant floral traits?



Changes in mutualist/antagonist communities drive differences in selection near vs. far from crops



## What does it mean?

### Conclusions

- Sunflower mutualists more abundant near, antagonists more abundant far from crops
- Beta-diversity of mutualists greater near crops
- Natural selection altered by proximity to sunflower crops
- Changes in mutualist/antagonist communities drive differences in selection near vs. far from crops
- This is one of few studies to show agricultural effects on natural selection across a landscape in a native plant species

### Implications

- Mutualist-antagonist framework may be useful in understanding agricultural effects on plant evolution
- Natural selection altered in agricultural landscapes, BUT contrary to expectation

Silhouettes from phylopic.org

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