Specialist aphid incidence on *Echinacea angustifolia* in burned and unburned prairie remnants

Allison Radin,[1] Wyatt Mosiman,[2,3] Mia Stevens,[3,4] Stuart Wagenius[3]

INTRODUCTION

- Prescribed fire is an increasingly common land management practice
  - Can increase plant productivity & flowering[1,2]
- Effects on specialist aphids are uncertain[3]

Echinacea angustifolia: long-lived prairie perennial

Aphis echinaceae: *Echinacea angustifolia* specialist aphid[3]

QUESTION

Do burn treatments affect incidence of specialist aphids on *Echinacea angustifolia* heads?

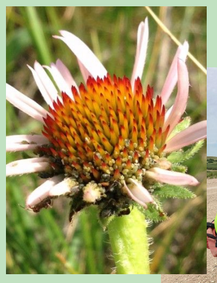
METHOD

Spring: burn 8 of 32 prairie remnants in Western MN

glm(pa.aph ~ Eapop + burn + hdCt + totDays, family = 'binomial')

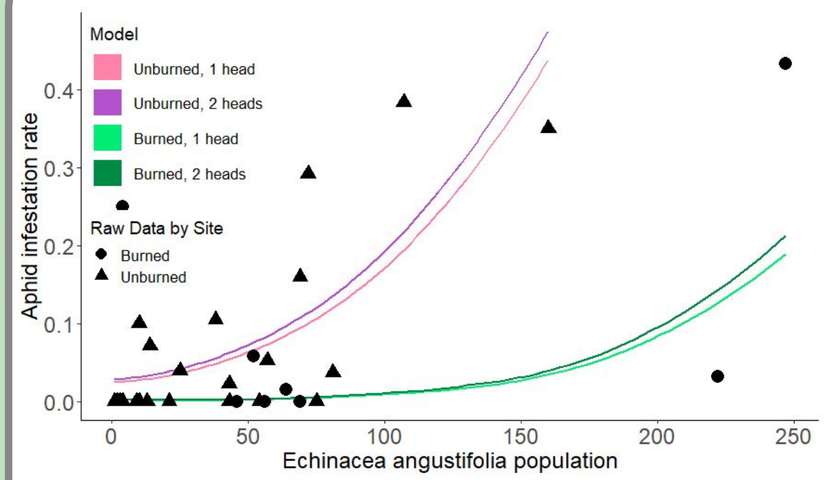
Variable	Definition
pa.aph	presence or absence of aphids
Eapop	# flowering *E. angustifolia*
burn	burn status of remnant
hdCt	# of flowering heads per plant
totDays	# of days plant was visited

Data analysis: fit models using R



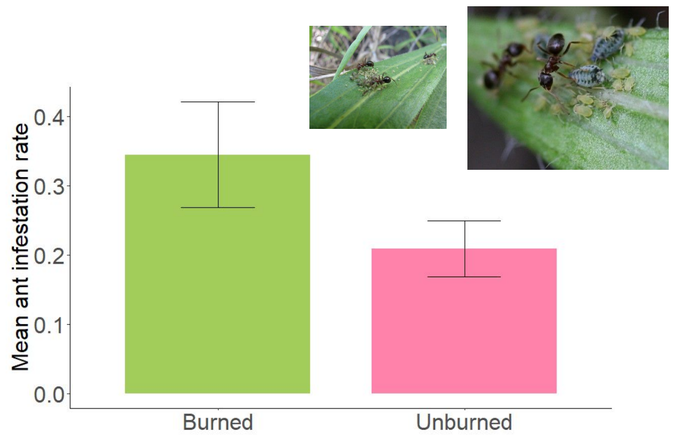
Summer: record aphid incidence on 1,692 *E. angustifolia* flowering heads every 3 days for 6 weeks

RESULTS



Predictors	p-value
# flowering *E. angustifolia*	< 0.001
Site burned	< 0.001
# of flowering heads per plant	0.03
# of days plant was visited	< 0.001
E. angustifolia pop: : site burned	0.22

- Our model predicts that aphid incidence will be higher when:
  - The remnant is unburned
  - The plant has multiple heads
  - We observed the plant more days



- We observed higher infestation rates of ants, an aphid mutualist[4], in burned remnants

DISCUSSION

- *Lower post-burn aphid levels* are consistent with some previous studies[3]
- *It is crucial to consider impacts* of prescribed burns on insect communities for effective conservation efforts[3]
- *More studies on specialized insects are needed to*
  - Further contextualize fire effects
  - Determine long-term fire impacts

FUTURE WORK

- *Insect community surveys*: unburned vs burned prairie remnants
- *Long-term aphid demography studies* following prescribed burns
- *Ant-aphid mutualism experiments*: tending and transporting aphids

Allison Radin and Wyatt Mosiman conduct field work

Team Echinacea 2021

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the echinacea project
Binghamton University [1]
Northwestern University [2]
Chicago Botanic Garden [3]
University of Minnesota [4]