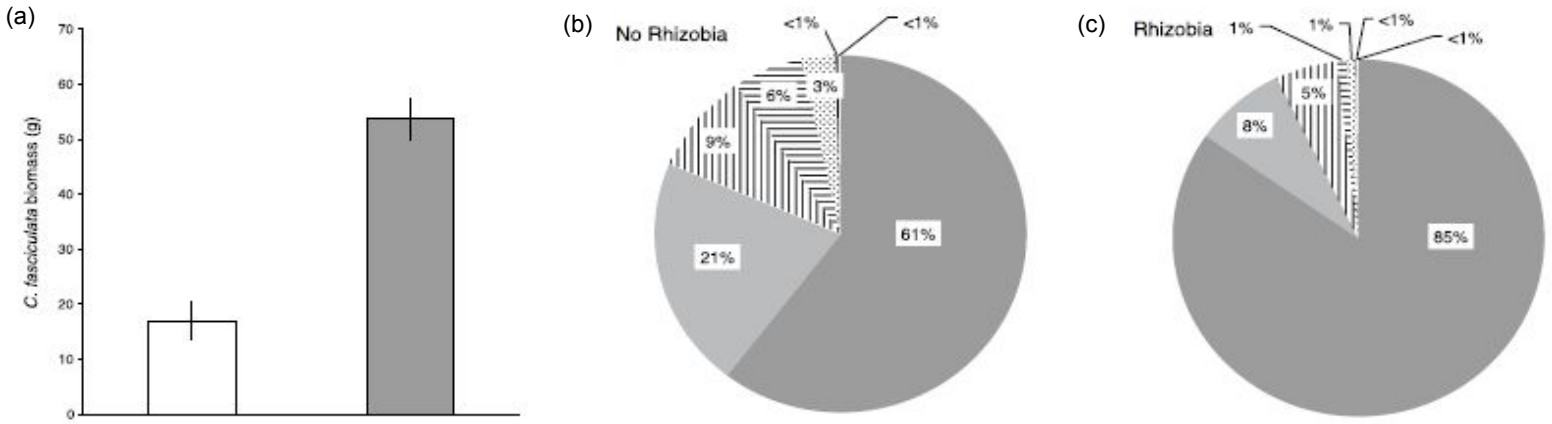
Data from Keller, 2014



a) Each *Chamaecrista fasciculata* plant grows much larger in the presence of rhizobia. b) When *Chamaecrista* is grown with other plants, **without** rhizobia, it represents 61% of the plant community by biomass. c) When *Chamaecrista* is grown with other plants, **with** rhizobia, it represents 85% of the plant community by biomass.

Before Class: construct a box-and-arrow descriptive model with the following terms: *Chamaecrista*, rhizobia, other plants, and compete. Bring a copy of your model to class as your homework.

Ecology 200

Lesson: Species interactions

Paper: Keller, K. R. (2014). Mutualistic rhizobia reduce plant diversity and alter community composition. Oecologia, 176(4), 1101-1109.

Species Interactions

Plant-rhizobia Mutualism

Potential Clicker Questions

What plants can form a symbiosis with rhizobia?

A. Legumes
B. Any plant

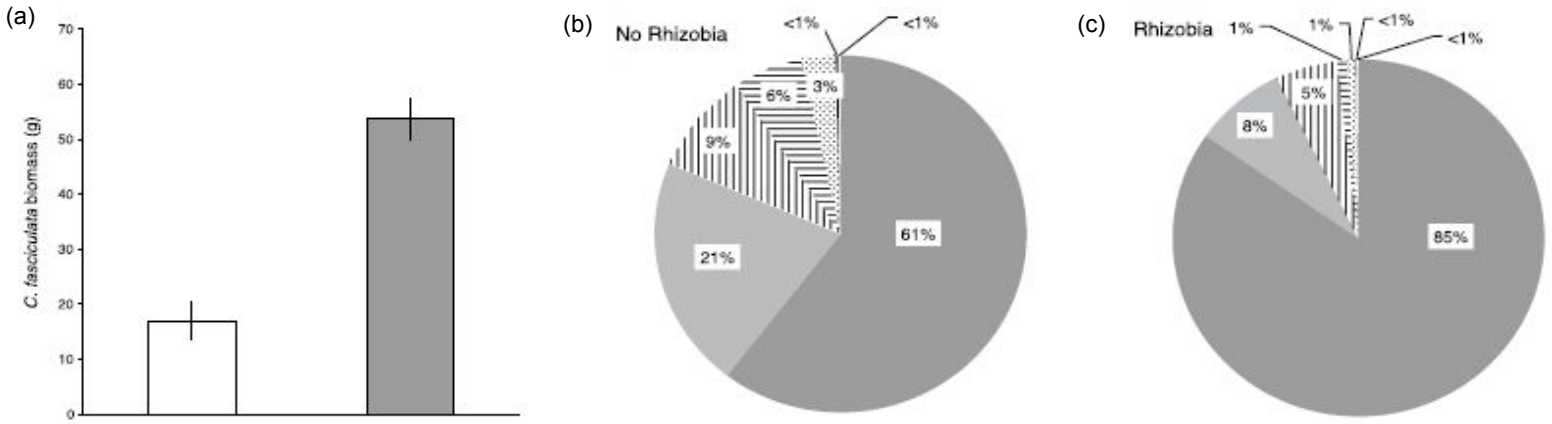
Which nutrients are involved in the legume-rhizobia symbiosis?

A. Nitrogen
B. Phosphorous
C. Carbon
D. A and C
E. All of the above

How are nutrients exchanged in the legume-rhizobia symbiosis?

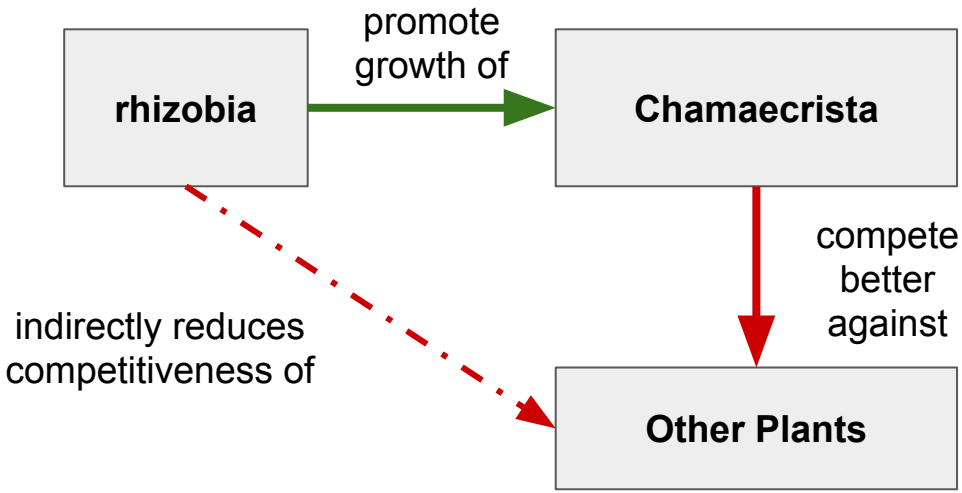
A. Nitrogen from rhizobia to plant, Carbon from plant to rhizobia
B. Carbon from rhizobia to plant, Nitrogen from plant to rhizobia

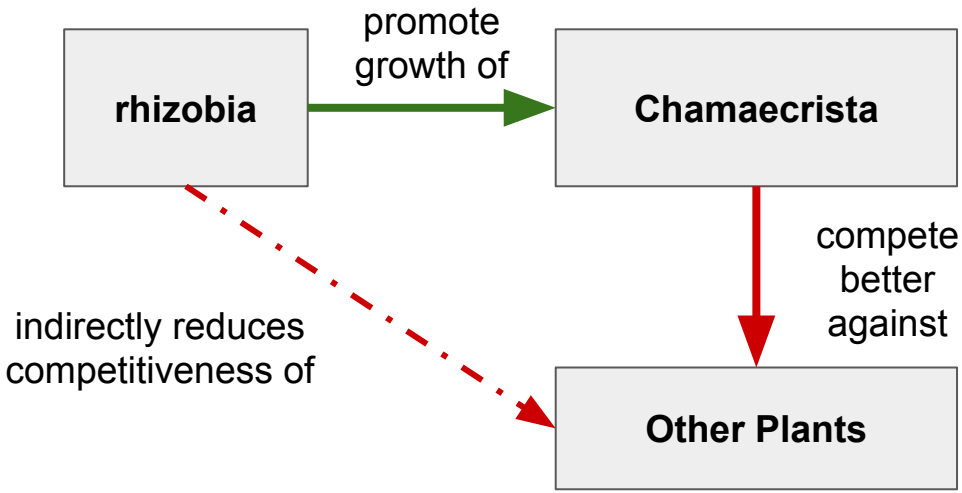
Data from Keller, 2014



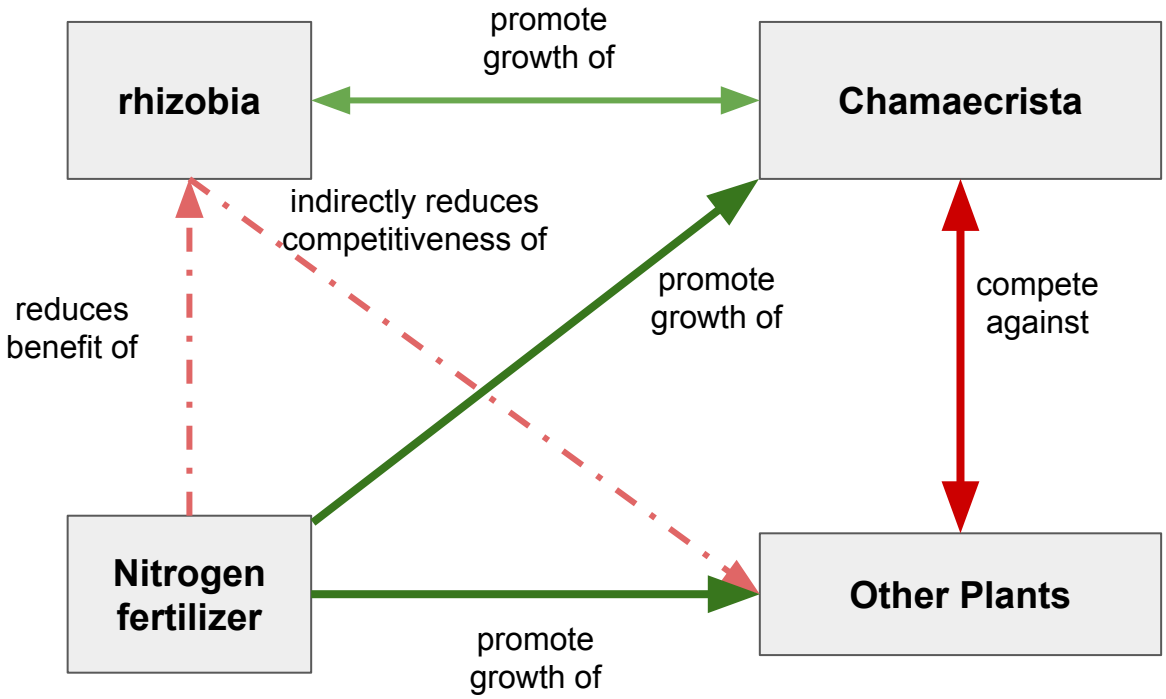
a) Each *Chamaecrista fasciculata* plant grows much larger in the presence of rhizobia. b) When *Chamaecrista* is grown with other plants, **without** rhizobia, it represents 61% of the plant community by biomass. c) When *Chamaecrista* is grown with other plants, **with** rhizobia, it represents 85% of the plant community by biomass.

Before Class: construct a box-and-arrow descriptive model with the following terms: *Chamaecrista*, rhizobia, other plants, and compete. Bring a copy of your model to class as your homework.

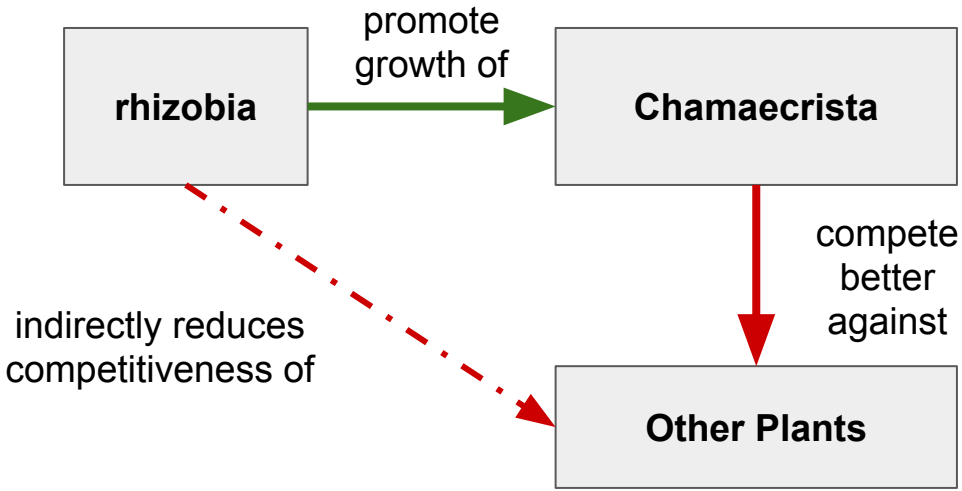

rhizobia
promote
growth of
Chamaecrista
compete
better
against
indirectly reduces
competitiveness of
Other Plants

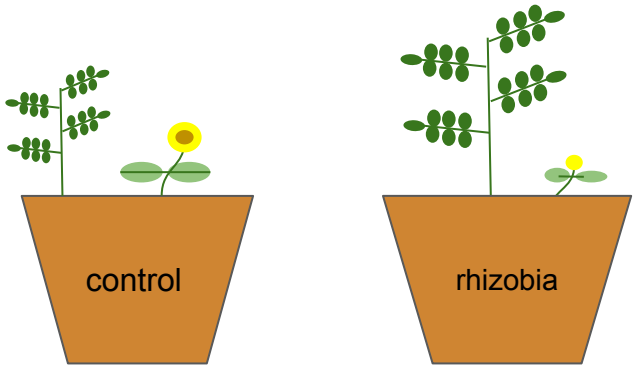


Add an additional component to your model: Nitrogen fertilizer. How do you predict that this change will affect rhizobia, Chamaecrista, and the other plants in the experiment?

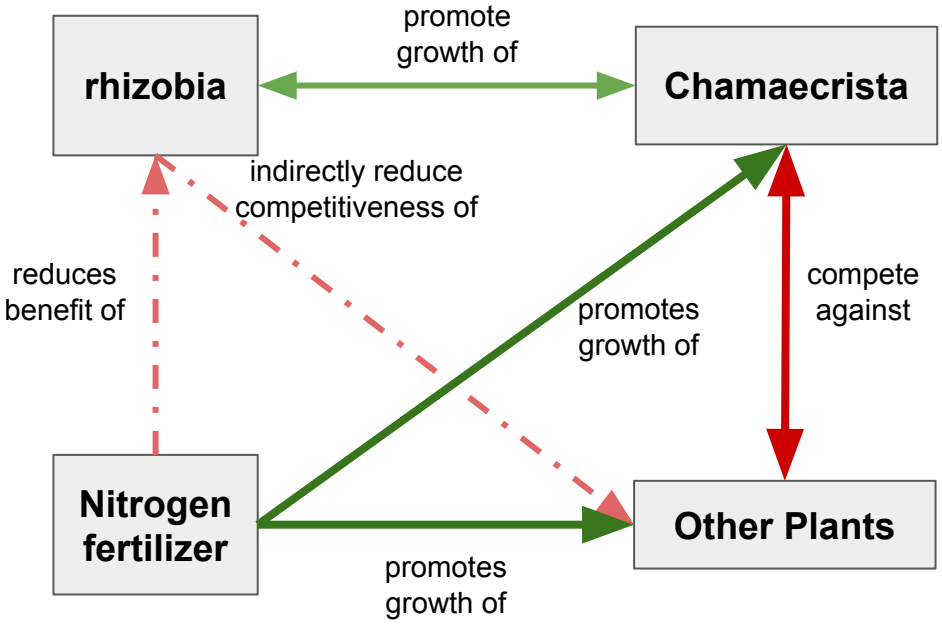

rhizobia
promote growth of
Chamaecrista
indirectly reduces competitiveness of
reduces benefit of
promote growth of
compete against
Nitrogen fertilizer
Other Plants
promote growth of

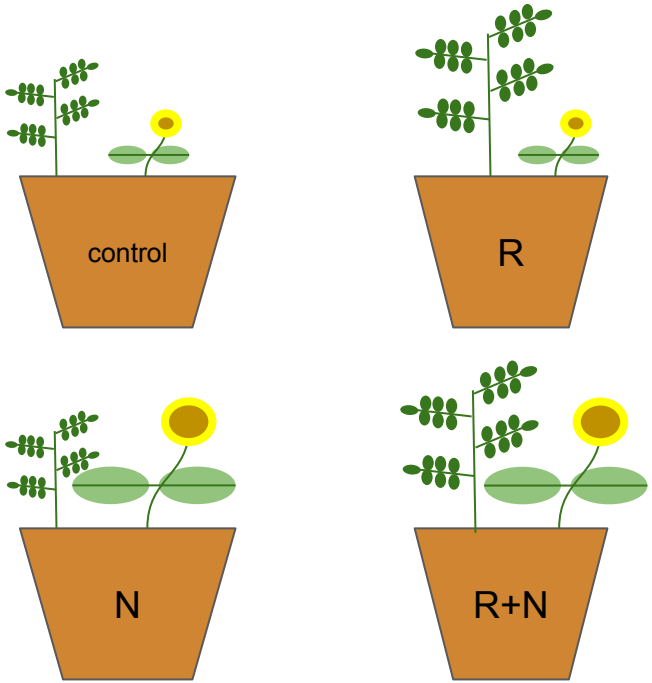
Experiment from Keller, 2014





Design an experiment to test your prediction, and include predictions of experimental outcomes





Example data

Rhizobia treatment	**Nitrogen treatment**	***Chamecrista* biomass (g)**	**Other plant biomass (g)**
No	No	200, 300, 250, 400, 225	100, 125, 80, 95, 110
Yes	No	500, 450, 550, 525, 475	95, 80, 75, 90, 100
No	Yes	225, 200, 250, 275, 210	250, 300, 325, 275, 310
Yes	Yes	400, 350, 300, 375, 410	200, 275, 300, 250, 285