

# Effect of host nutritional status on defense investment

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# Background

**Goal:** To test the effect of host nutritional status on defense investment.

In four plant hosts of a generalist, vector-borne pathogen, host nutrition was manipulated directly, by increasing nitrogen availability, or indirectly, by changing the arbuscular mycorrhizal fungi (AMF) community with which hosts associate.

Based on the Growth Differentiation Balance hypothesis of plant defense investment, we predicted that individuals in low nutrient environments (ambient conditions) would invest more in defense than individuals associating with AMF or in high nitrogen environments.

Leaf mass per area (LMA) was used to quantify defense investment. More dense, higher LMA leaves may be harder for arthropod vectors to penetrate, thus conferring protection against the pathogens they transmit.

# Results

AMF association had no significant effect on LMA.

Nitrogen addition significantly increased LMA in only one of the four host species, *Elymus glaucus* ( $p=0.041$ ).

LMA was either unaffected by host nutrition or responded in the opposite direction as predicted by the Growth Differentiation Balance hypothesis, suggesting that this hypothesis cannot explain patterns of defense investment in this system.

