Forest insects and climate change

Christer Björkman, Maartje Klapwijk, Ida Kollberg and Helena Bylund
Department of Ecology
Swedish Univ. of Agricultural Sciences, SLU, Uppsala

BACCARA

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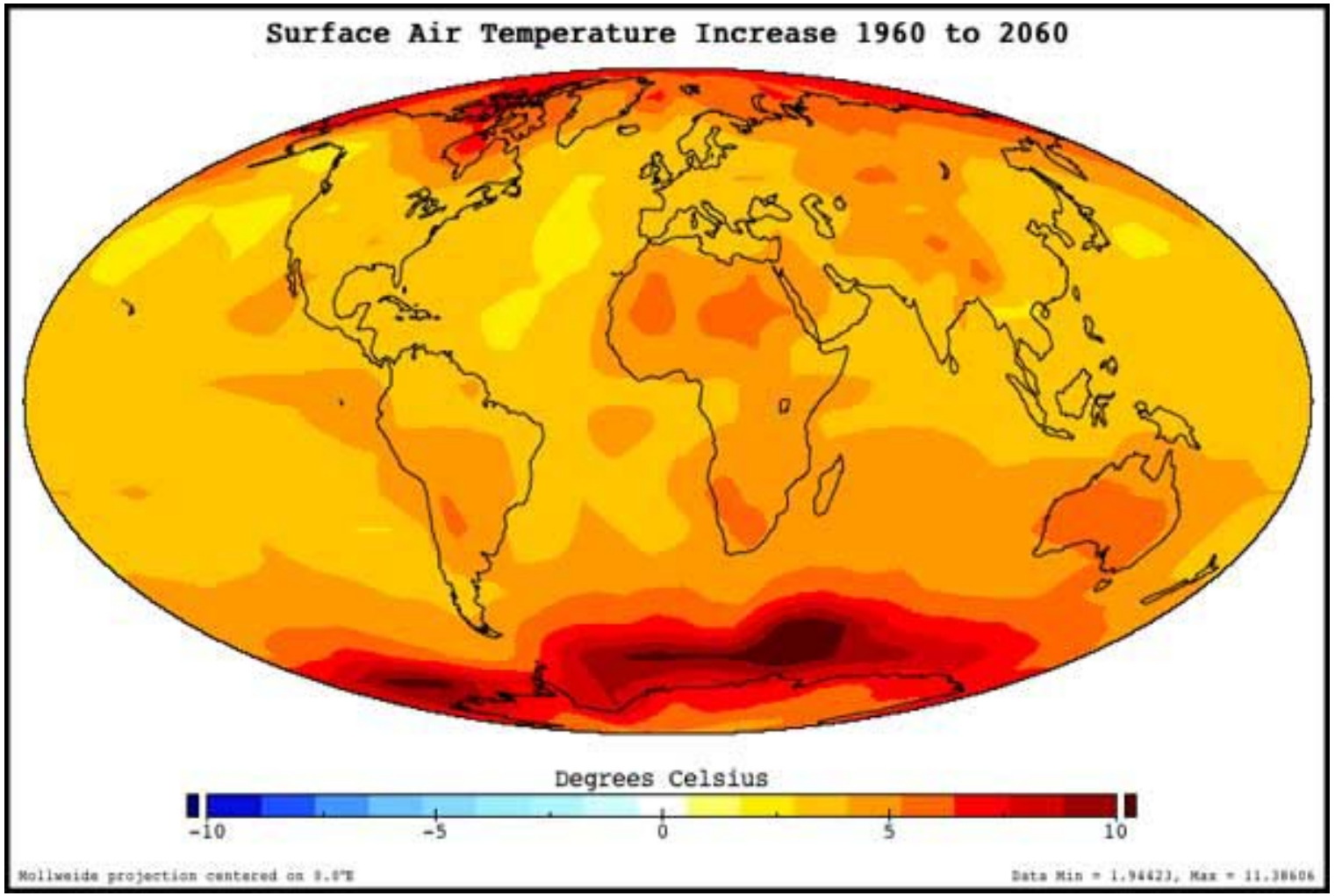
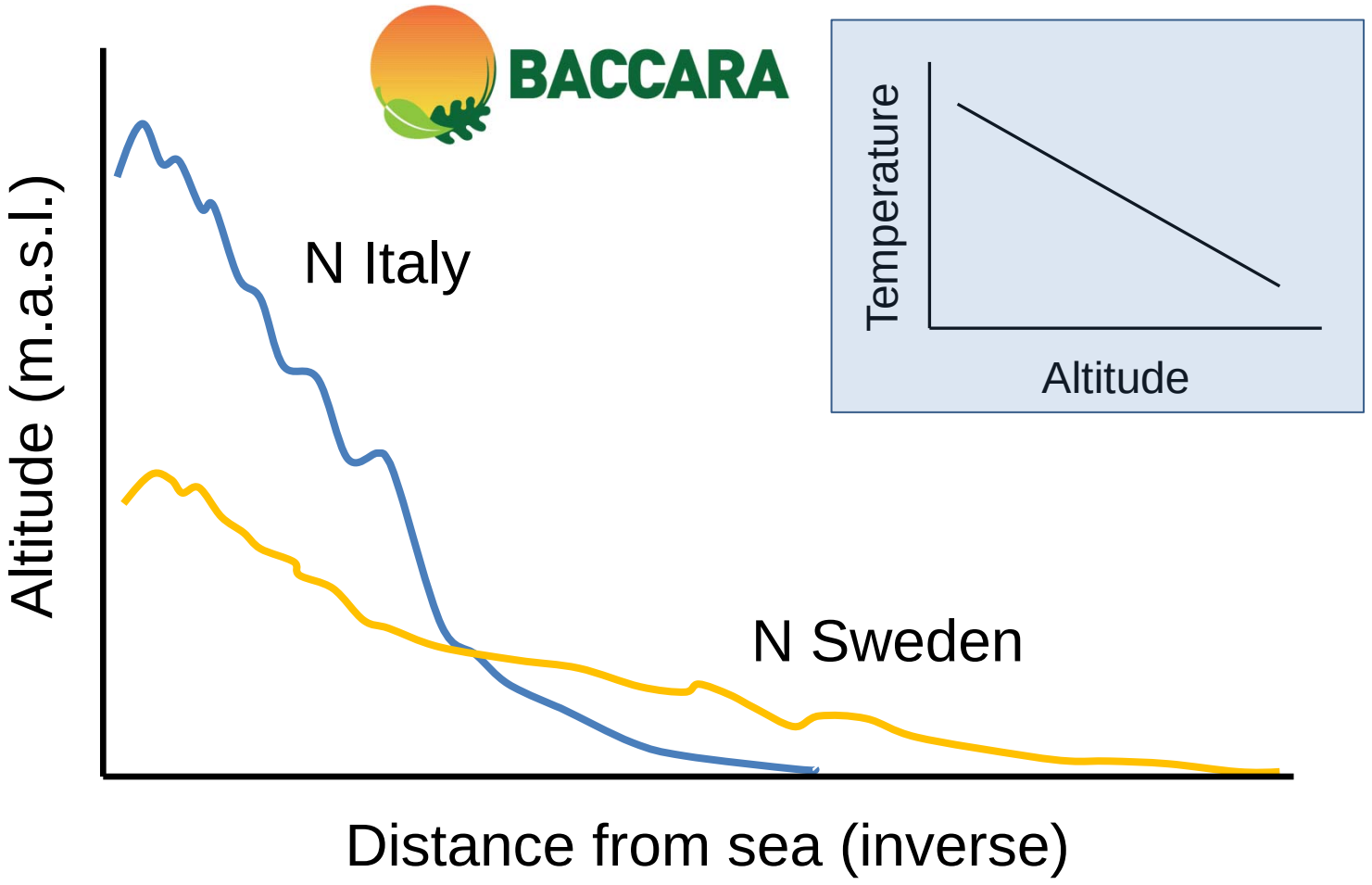
Climate change



Insects are poikilothermic

Should respond positively to increased temperature

Topographic profiles

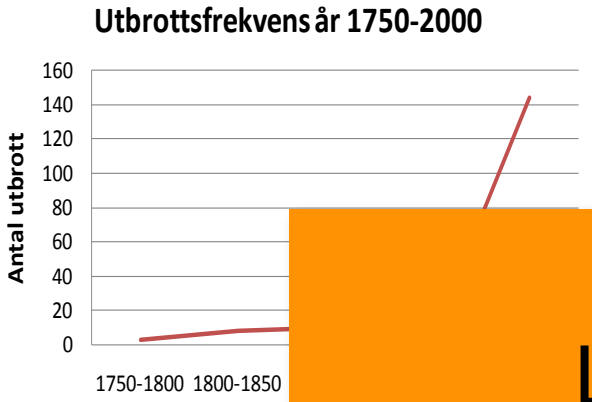


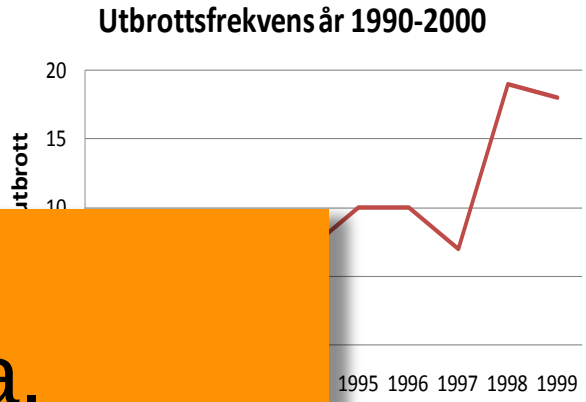
Approaches

- Analyses of time series data in relation to observed changes in climate
- Experiments along climatic gradients

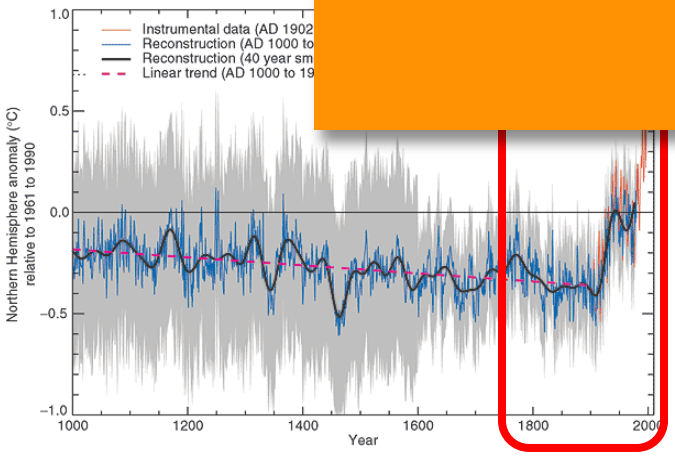
  Field and lab

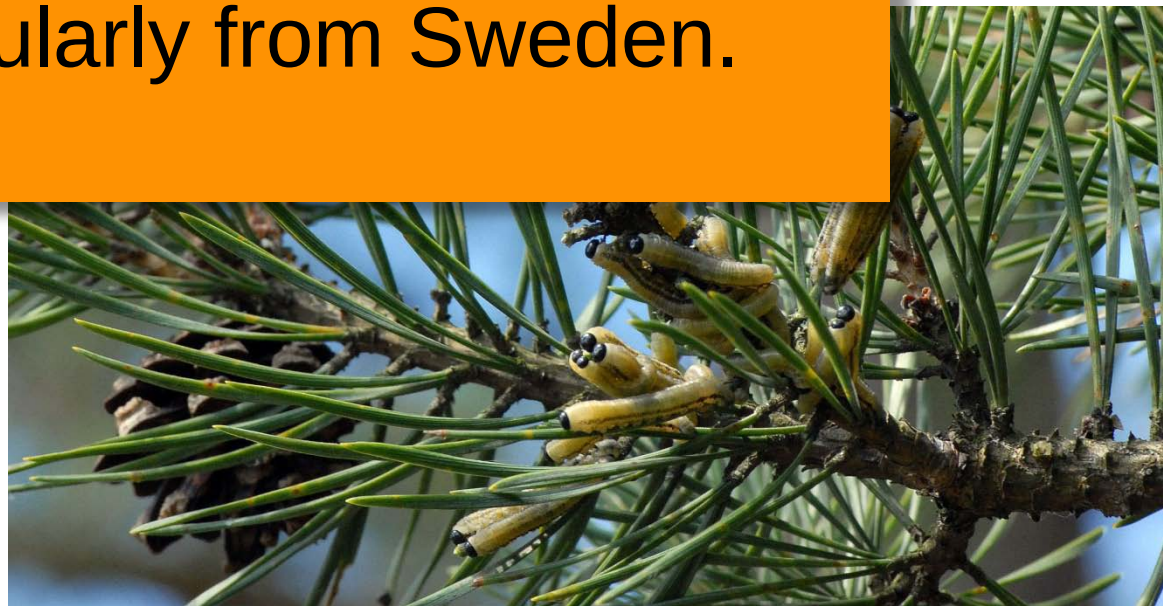
Are there trends over time?





Lack of good data.
Particularly from Sweden.





Pine sawflies (Hym., Diprionidae)

Data from Hungary

Forest insect species 1961 – 2009
Damage data provided by Gyuri Csoka

Thaumetopoea processionea (Notodontidae), Oak processionary moth

Tortrix viridana (Tortricidae), Green oak leaf roller

Malacosoma neustria (Lasiocampidae), Lackey moth

Euproctis chrysorrhoea (Lymantriidae), Brown-tail moth

Lymantria dispar (Lymantriidae), Gypsy moth

Rhyacionia buoliana (Tortricidae), European pine shoot moth

Thaumetopoea processionea L.

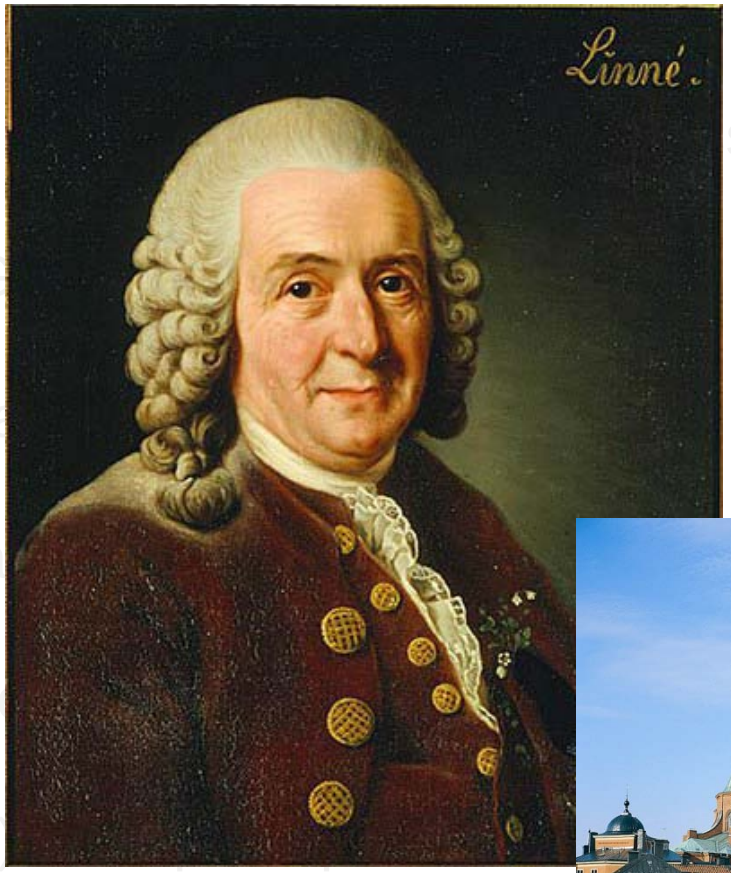
Tortrix viridana L.

Malacosoma neustria L.

Euproctis chrysorrhoea L.

Lymantria dispar L.

Rhyacionia buoliana



Carl von Linné

Thaumetopoea processionea (Notodontidae), Oak processionary moth

biolib.cz

Tortrix viridana (Tortricidae), Green oak leaf roller

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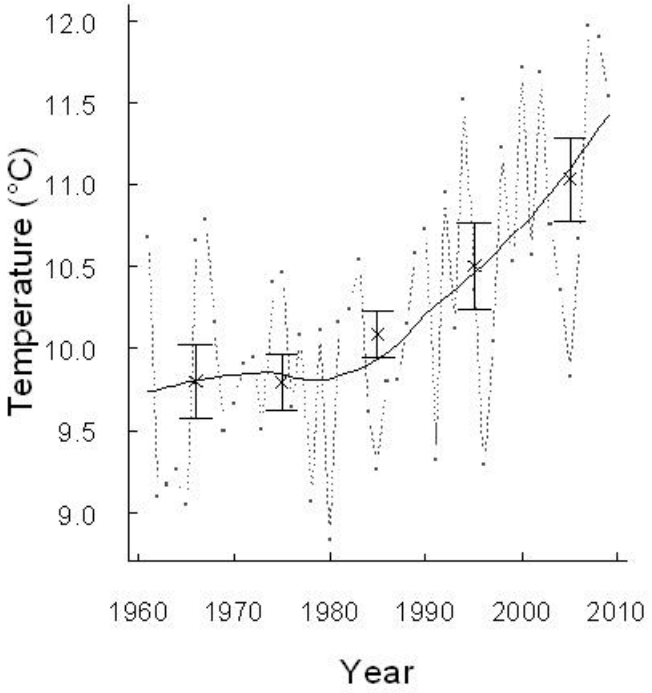
Lymantria dispar (Lymantriidae), Gypsy moth

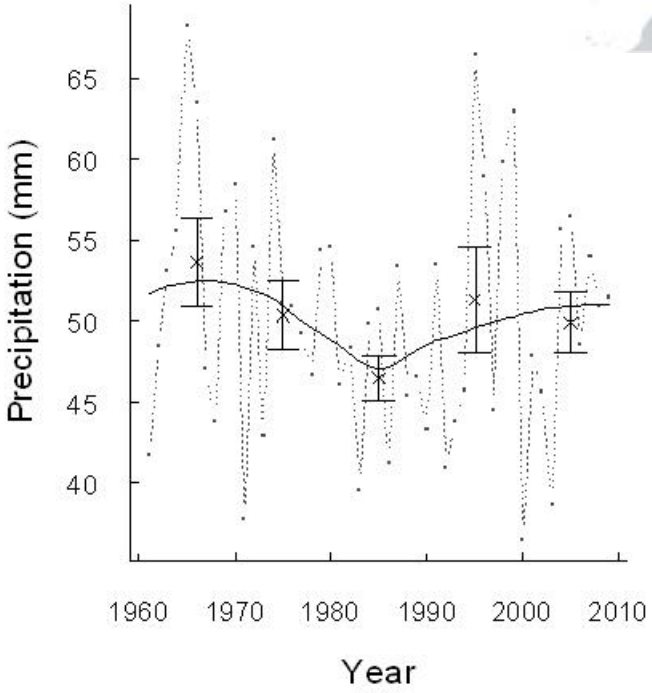
Rhyacionia buoliana (Tortricidae), European pine shoot moth

Data from Hungary

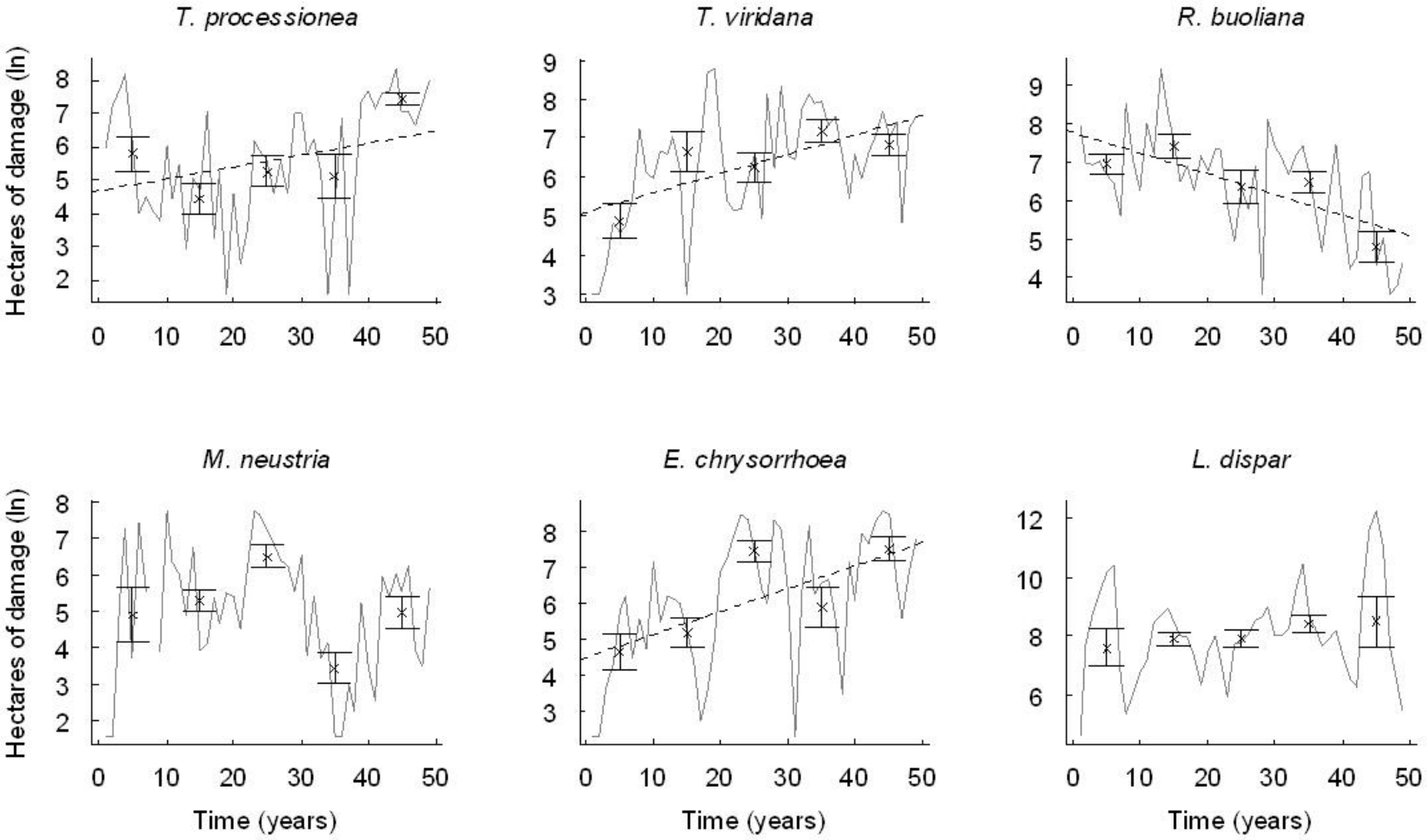
Temperature



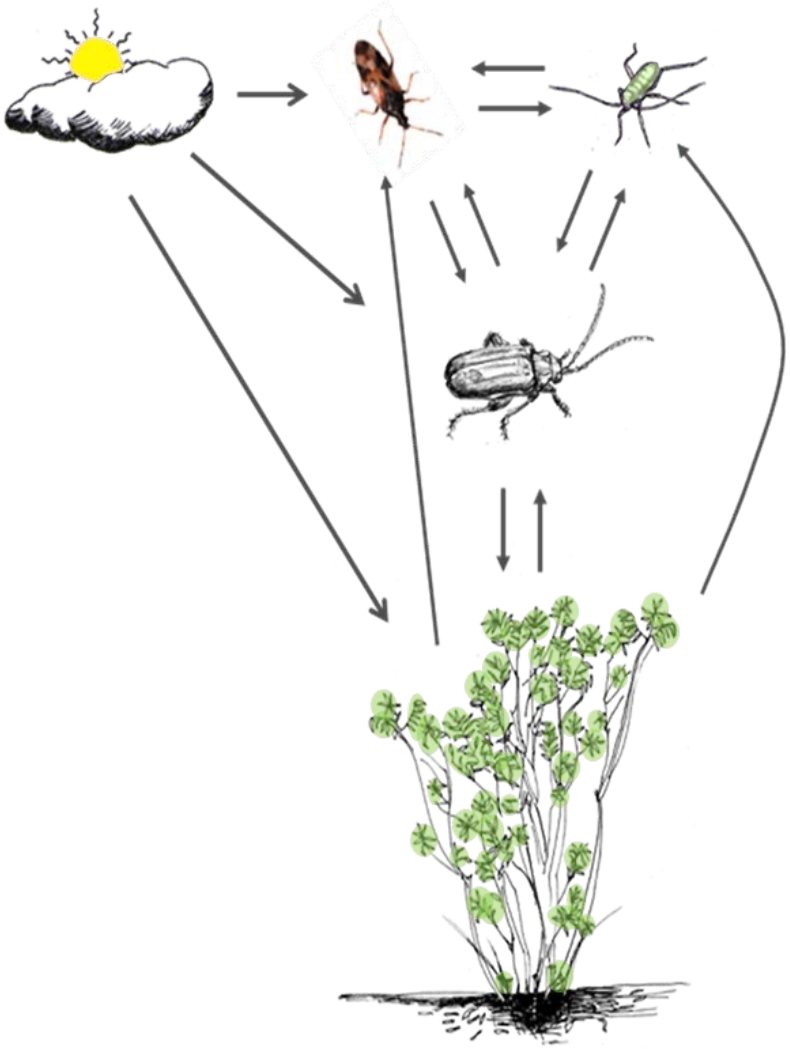
Precipitation

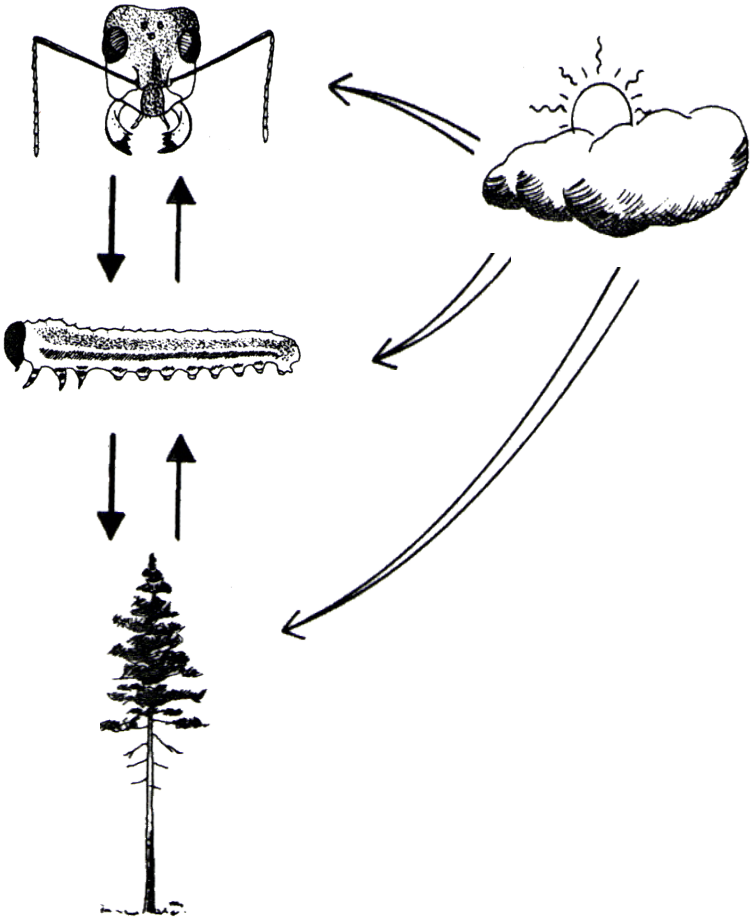


Data from Hungary



Why no clear patterns?





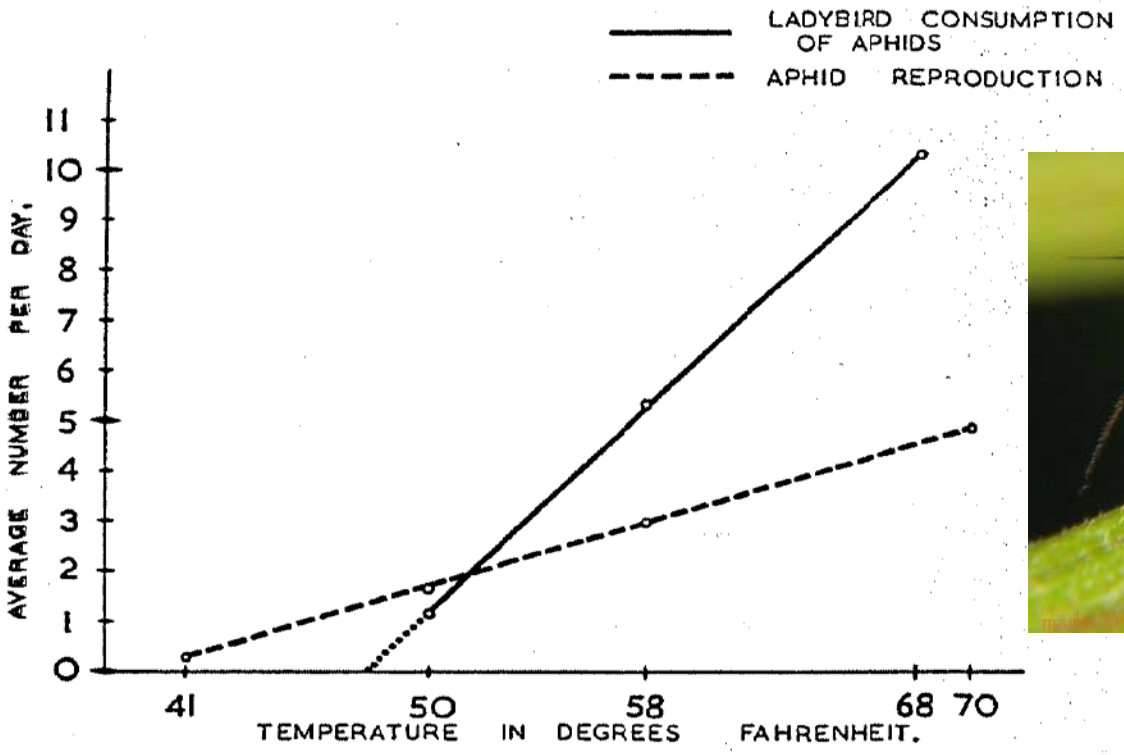
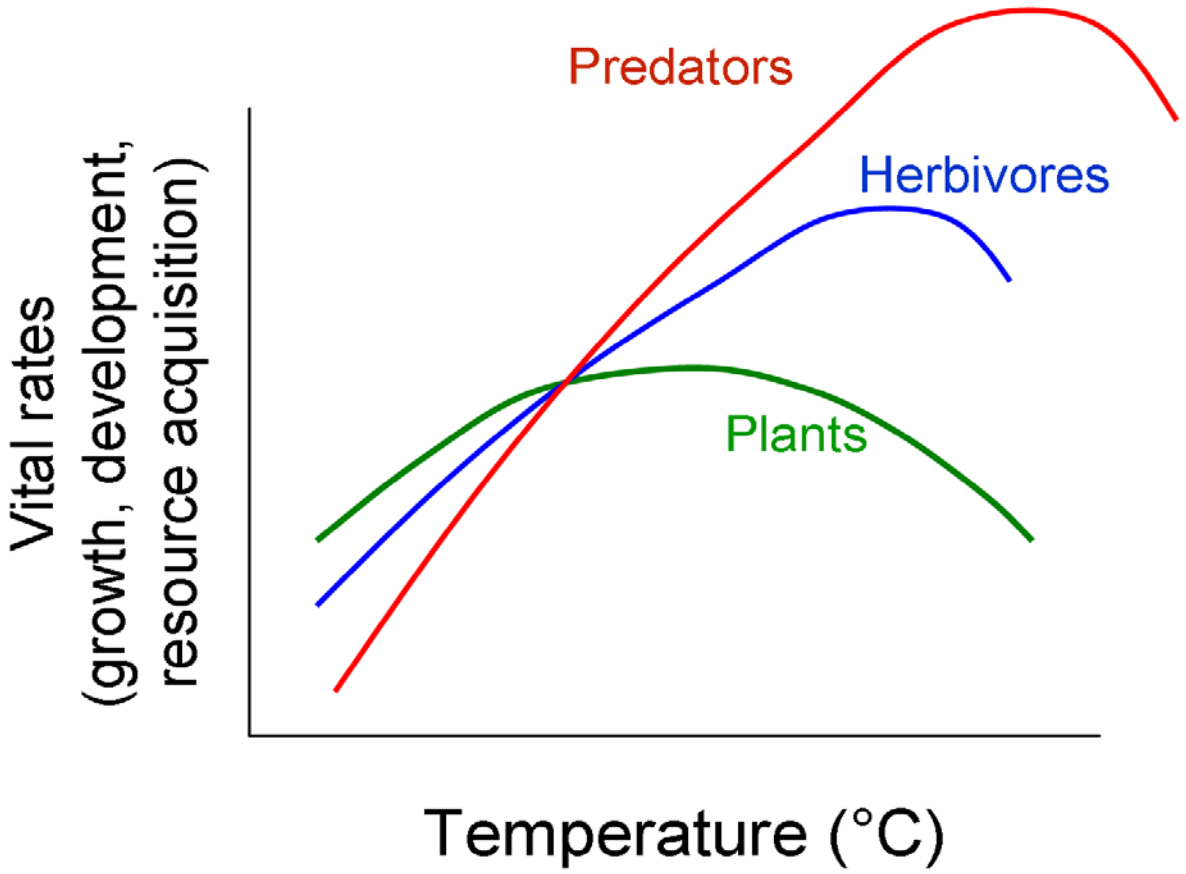


Fig. 1

The average number of aphids consumed and produced each day at various temperatures.

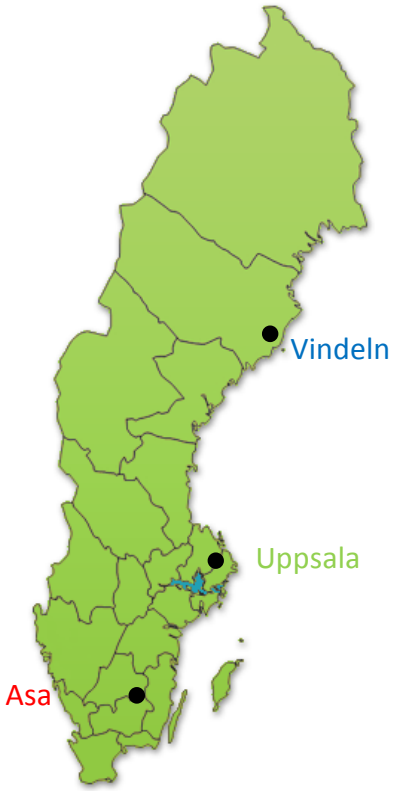
Dunn, JA. 1952. The effect of temperature on the pea aphid—ladybird relationship. 2nd Rep. Natl Veg. Res. Sta. Wellesbourne, pp. 21-23.

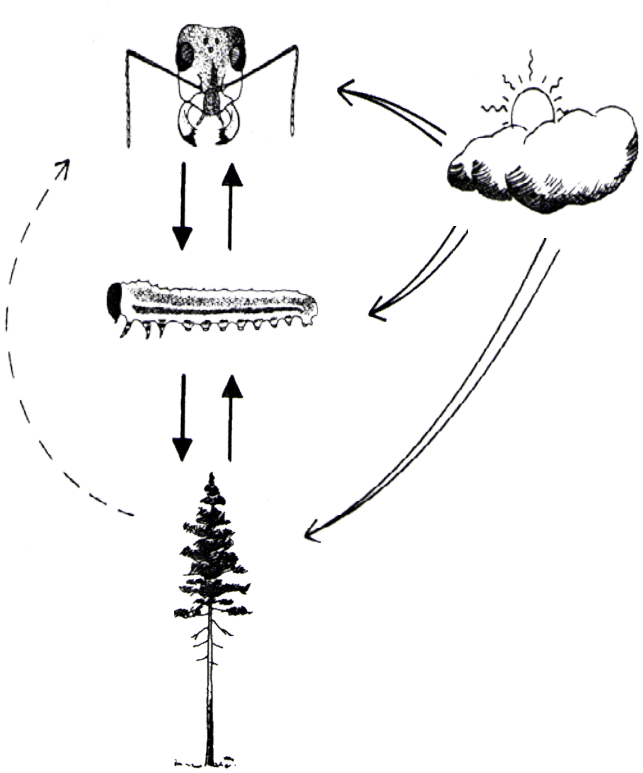


Berggren et al. Oikos (2009)

Pine sawflies

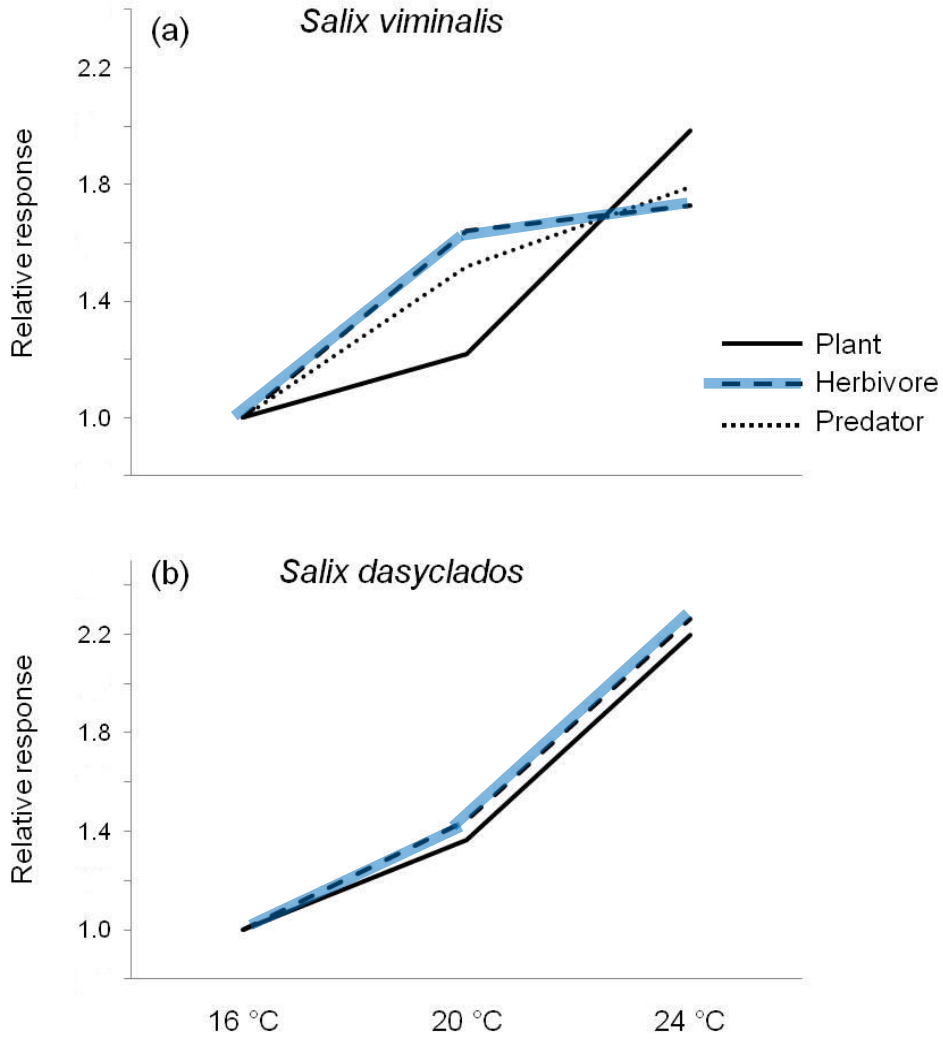
Trophic interactions along climatic gradients in field and lab

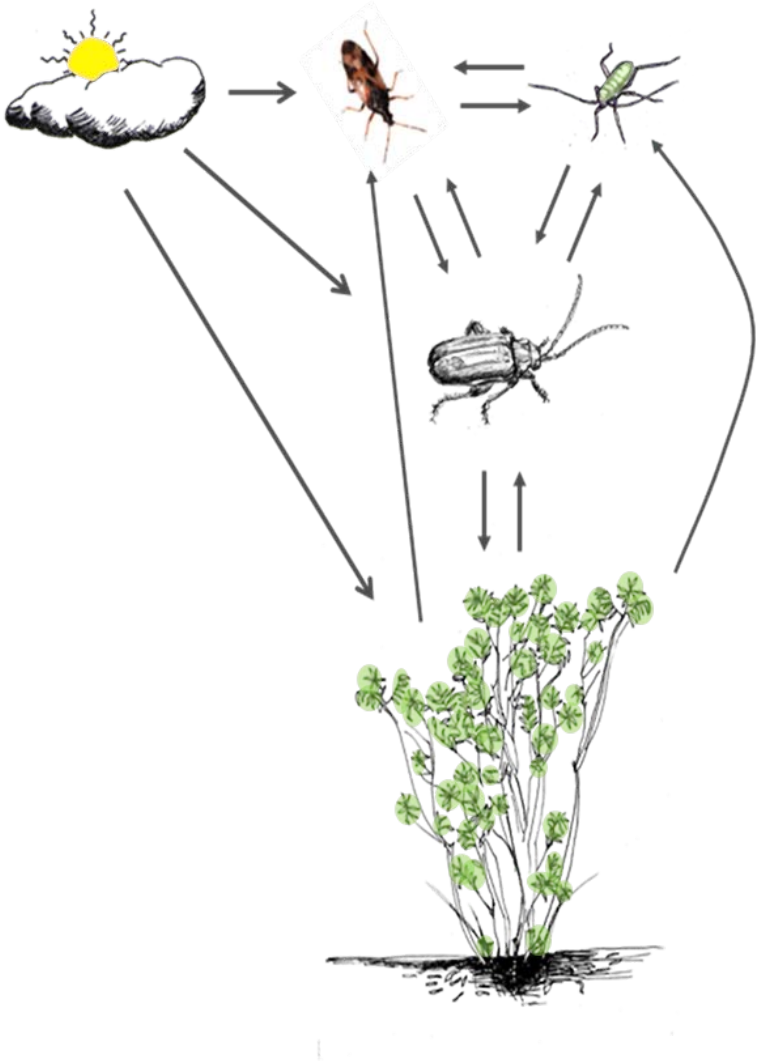




Willow insects

Lab expt





Future

- Can management mitigate effects of climate change?
- Or the opposite?

Acknowledgements

Gyuri Csoka, Mart-Jan Schelhaas, Matt Ayres, Karin Eklund, Tea Ammunét, Åsa Berggren, Stig Larsson, Lars Bärring, Mikaela Torp, Martin Weih et al.

BACCARA - EU project
Swedish Energy Agency
Oscar and Lili Lamm foundation
Formas
NL faculty, SLU