Restoration of insect communities in Dutch chalk grasslands

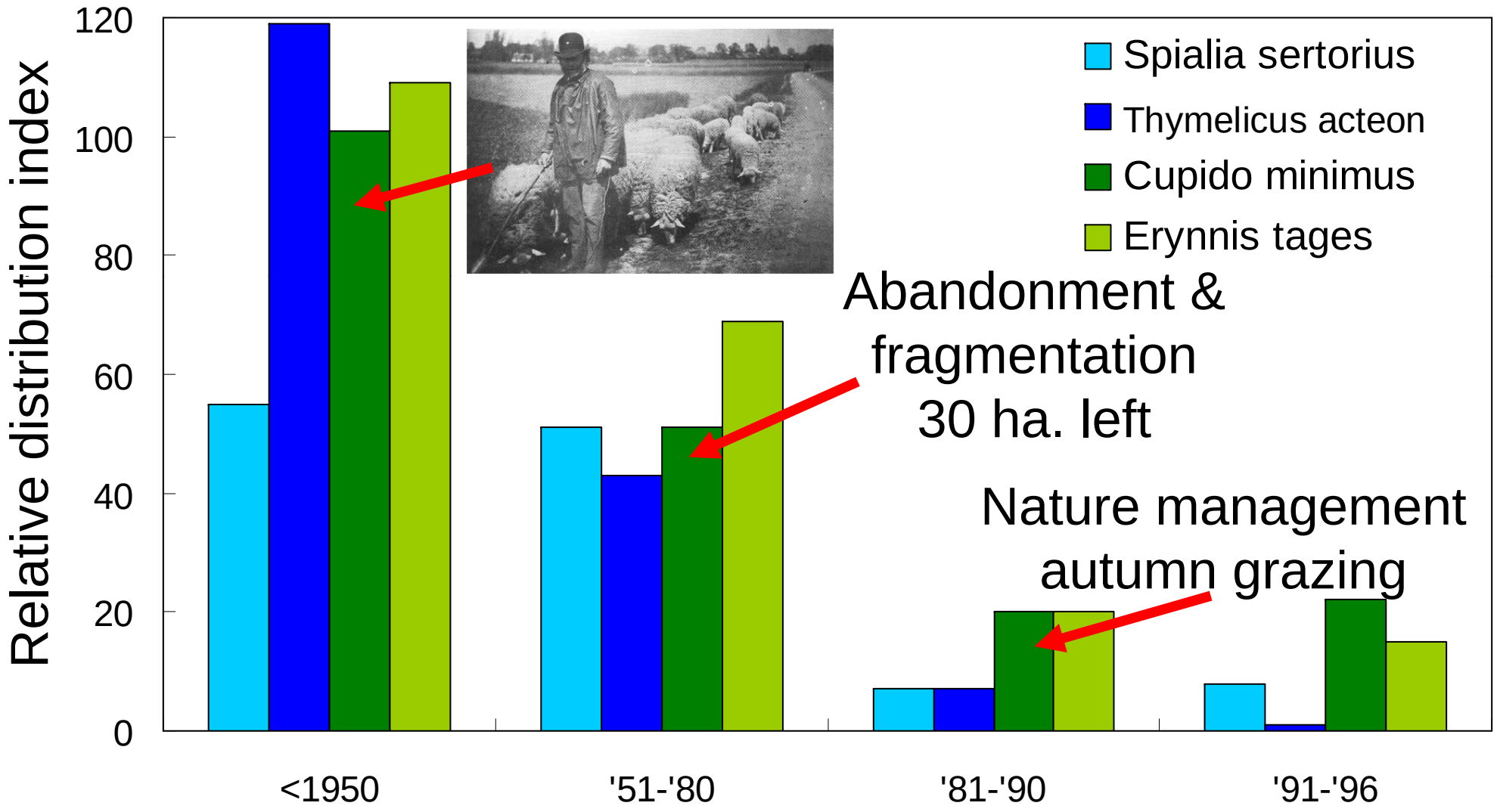
Toos van Noordwijk

Dutch chalk grasslands

Stichting Bargerveen

Adapted from: Wallis de Vries et al. 2002

Dutch chalk grasslands



Stichting Bargerveen

Adapted from: Wallis de Vries et al. 2002

Research questions

- What is the current status of chalk grassland insect communities?
- What are the main bottlenecks?
- What restoration measures should be taken? How should sites be managed?

Research program

Inventory Dutch & reference sites

Distribution data

analyse past and present distribution

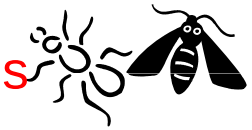
Status

life-history analysis

Bottlenecks

experimental testing

translate bottlenecks into management adaptations



Management proposition

Check for soil, vegetation & other fauna

management experiments

Adapted management

Stichting Bargerveen

Life-history tactic approach

- What do species need? Are these requirements met in all sites?
- Way to deal with multiple factors and site characteristics
  - *fragmentation, abandonment, eutrophication, reinstated management*
  - *size, degree of isolation, exposition, inclination, past & present management, soil composition, surrounding vegetation etc.*

Traits differing between species

Worker production

Speed of larval development

Hibernation stage

Colony size

Max colony age

Timing of first egg production

Pleometrosis

Gyne production

Gyne size

Mode of colony founding

Mode of dispersal

Timing of nuptial flight

Main differences between ants

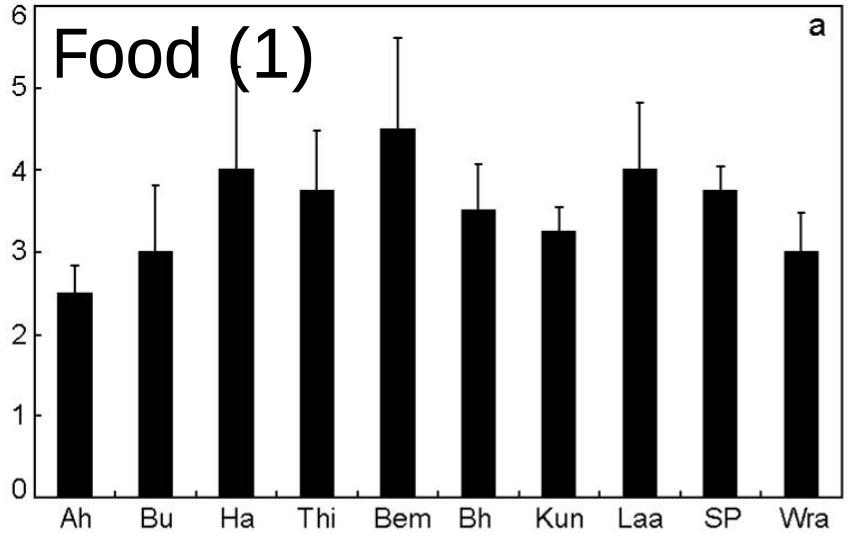
- Mode of colony founding
  - Semi-claustral (foraging queens)
  - Claustral (own fat reserves)
  - Parasitic
  - Nest splitting
- Mode of dispersal
  - Flying
  - Walking
- Synchronisation to winter period
  - Time constrained
  - Not time constrained

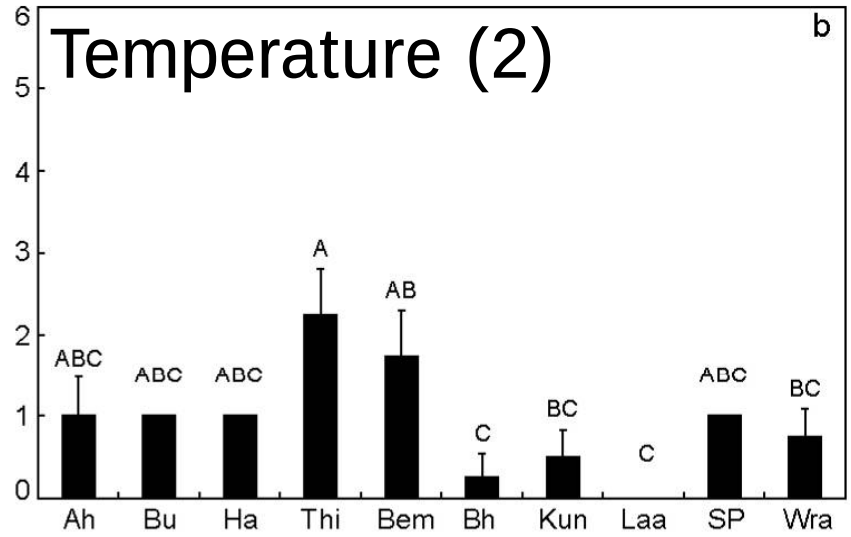
Predicted responses

Tactic	Isolation	Temperature	Food availability
1) Foraging Queen			X
2) Claustral, t-c		X	
3) Claustral not t-c			
4) Permanently parasitic	X		
5) Temporally parasitic	X		
6) Nest-splitting + parasitic	X		
7) Nest-splitting	X		

Applying tactics to field data

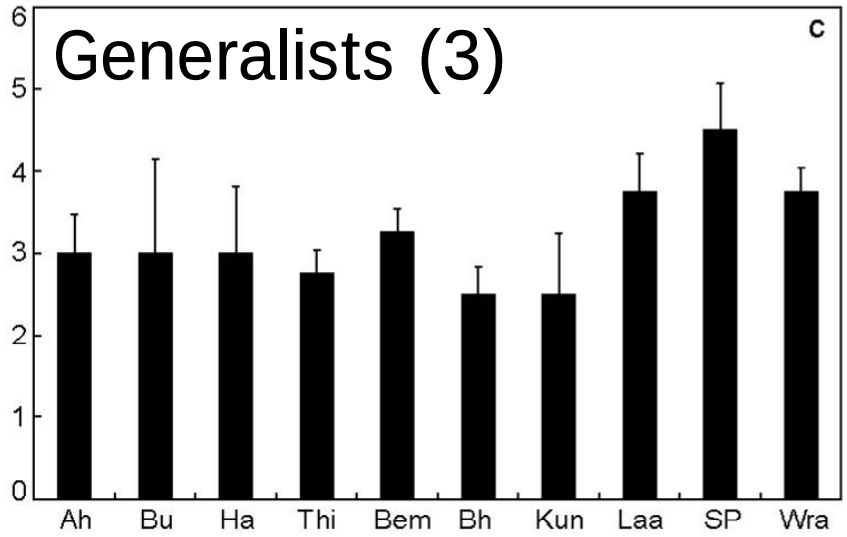
p=0.50

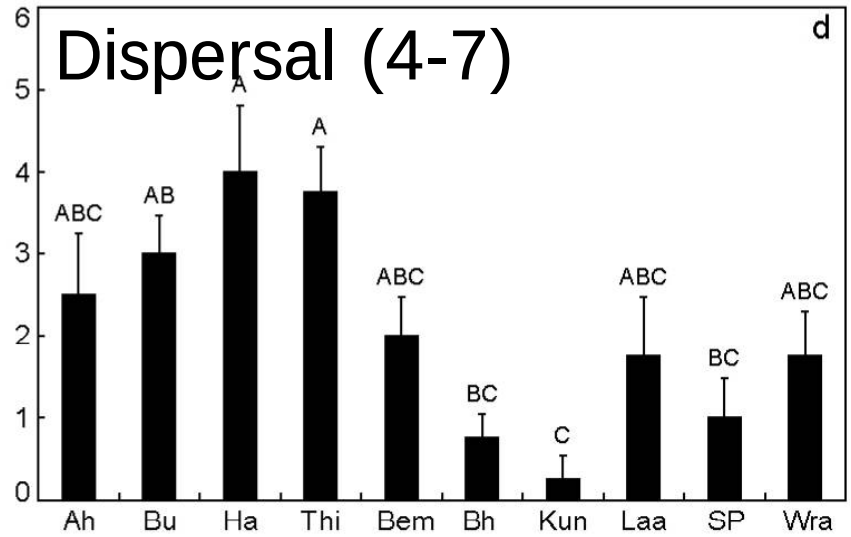




p<0.01

p=0.23

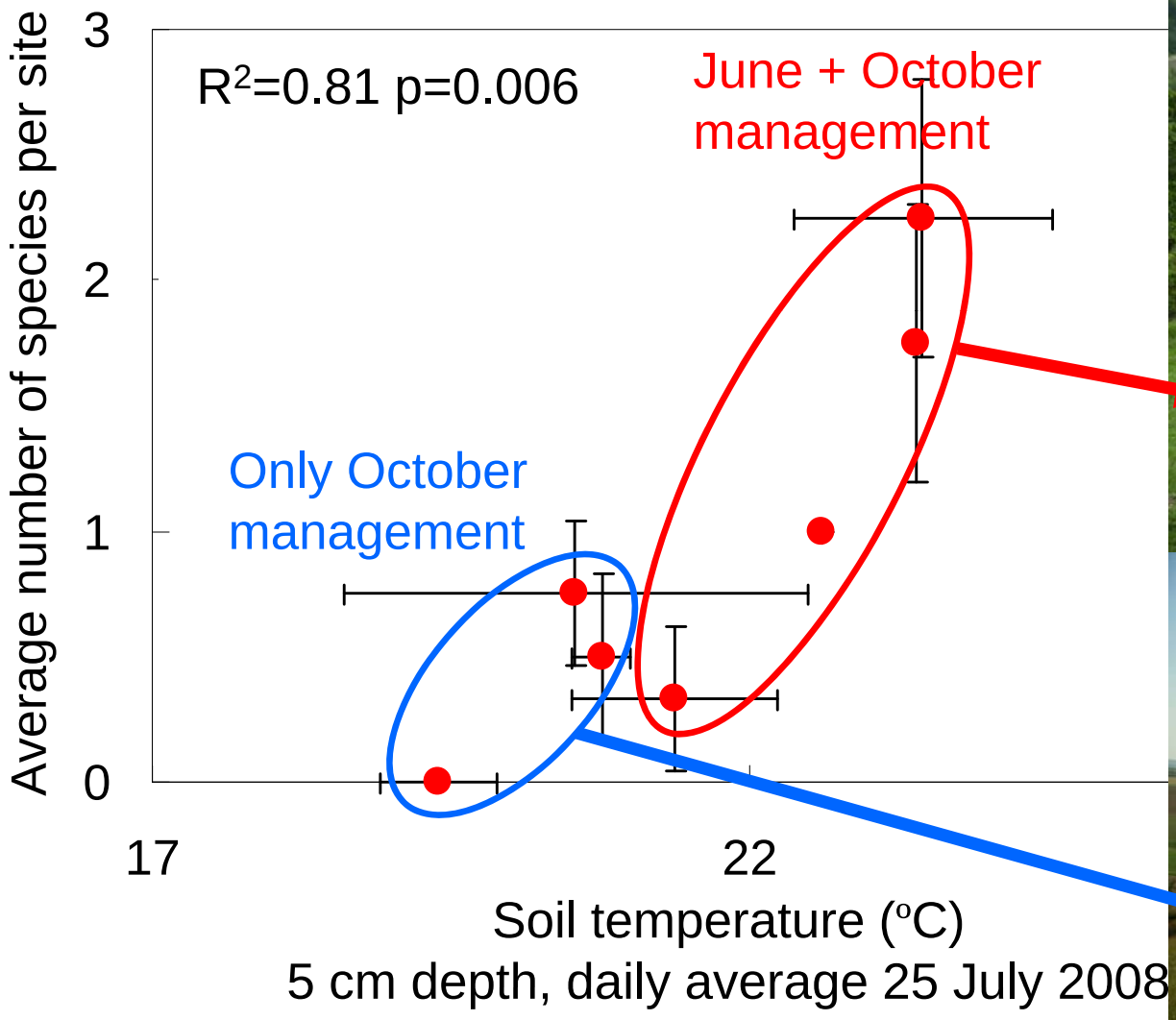




p<0.01

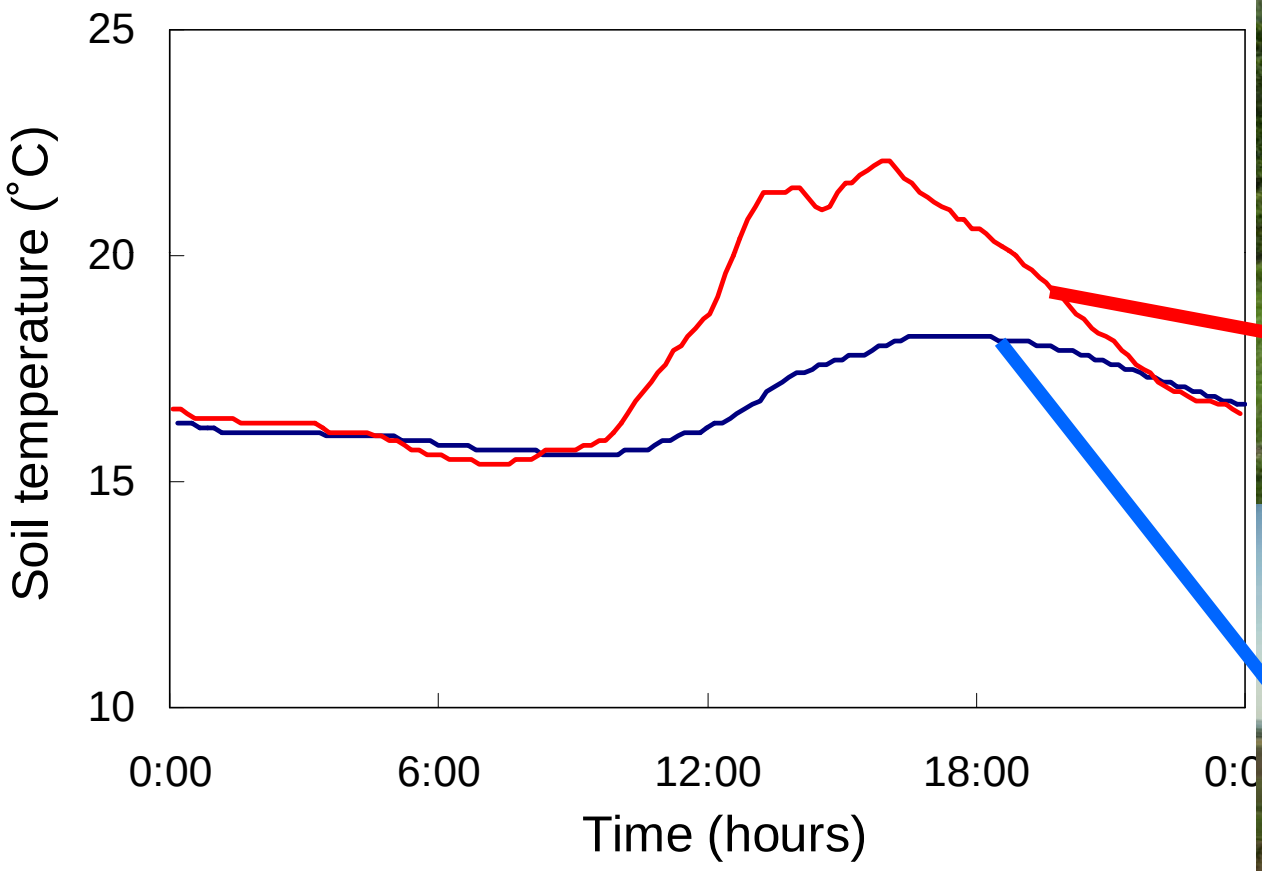
Stichting Bargerveen

Temperature (tactic 2)



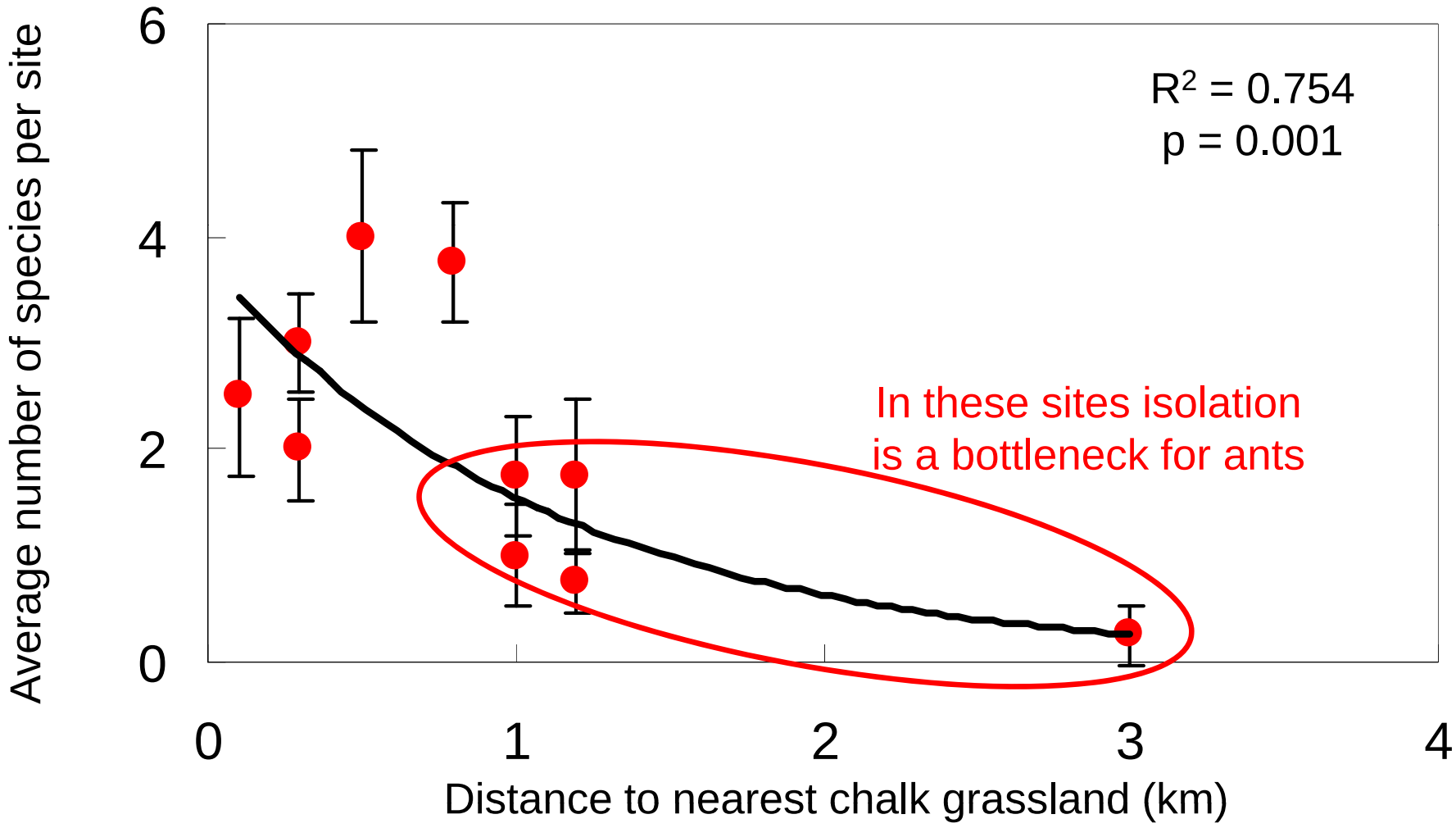
Stichting Bargerveen

Temperature (tactic 2)



Stichting Bargerveen

Isolation (tactic 4-7)



Stichting Bargerveen

End

Stichting Bargerveen