NIBIO
NORWEGIAN INSTITUTE OF BIOECONOMY RESEARCH

Implications for conservation management of hay-meadows; cutting dates and surrounding landscapes

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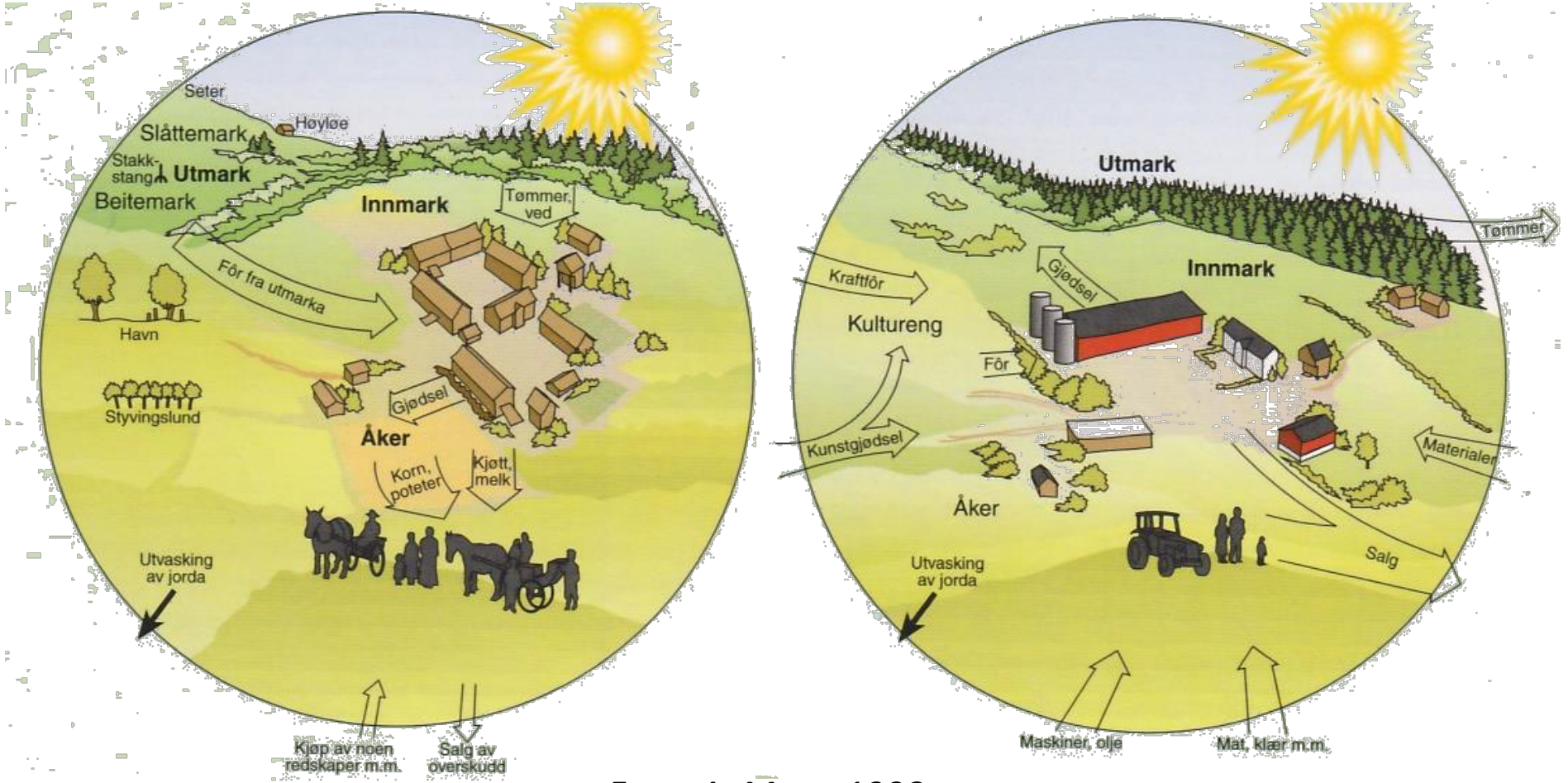
Norwegian land-use history



From A. Moen 1998

Biodiversity

Land-use change → coastal heathlands

Conifers dispersing from plantations (Vikna)

Juniper establishment (Roan)

Birch expansion (Nærøy)

Johansen, Velle, Wehn, & Hovstad. 2015.
Kystlynghei i Naturindeks i Norge - Utvikling av indikatorer og datagrunnlag. NIBIO RAPPORT 1(5)

Biodiversity

Land-use change → Semi-natural grasslands and Boreal heaths in mountains

Juniper, salix spp and birch encroachment

Wehn 2009 *Agriculture, ecosystems and environment*
Wehn et al. 2011 *Landscape and urban planning*
Wehn et al. 2012 *Norwgegian journal of geography*

Biodiversity

Land-use change → Semi-natural grasslands in lowland

Hay meadows

High cover of herbs
Plant species evenly distributed

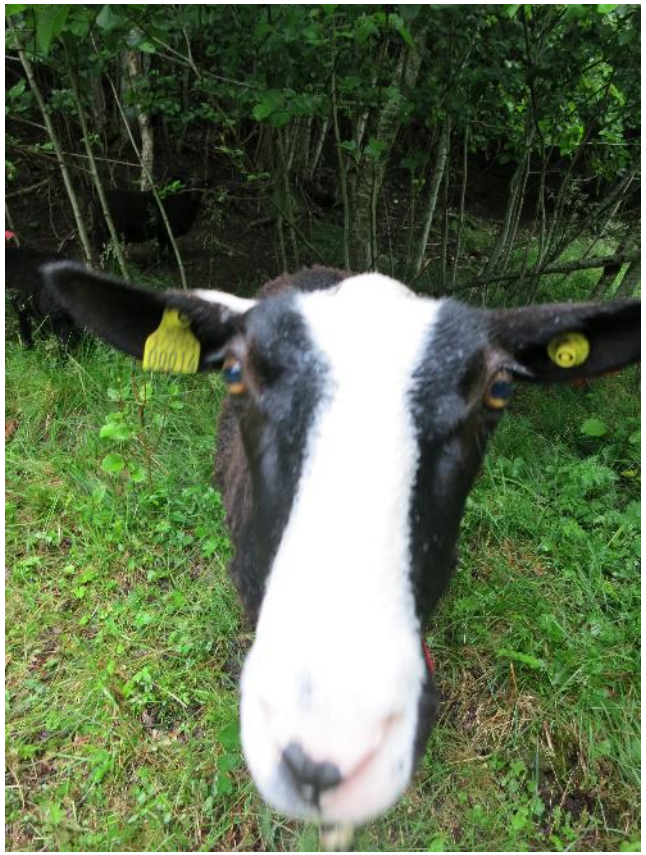
Pastures

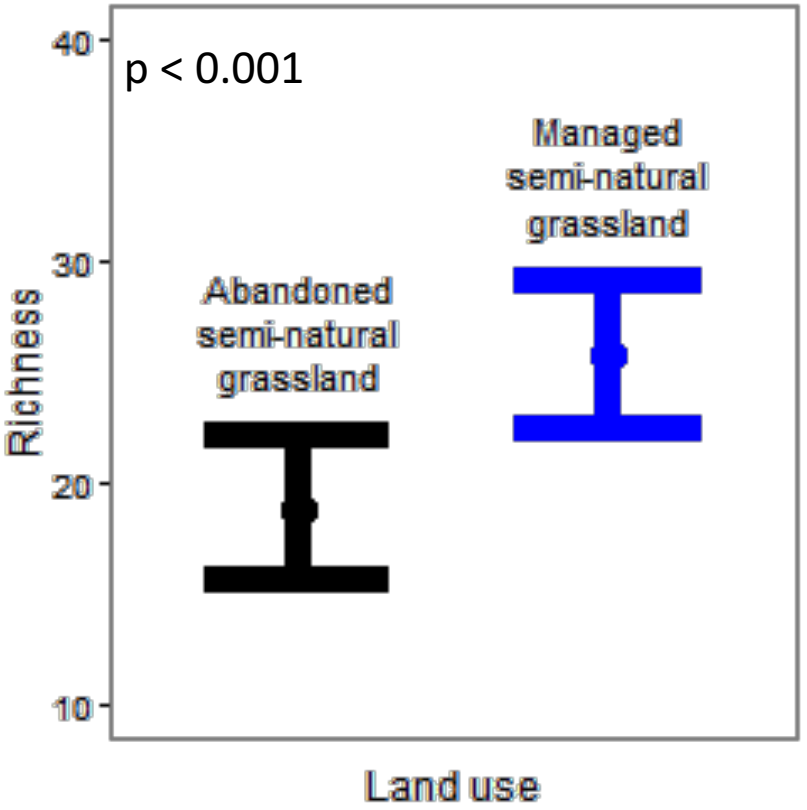
High cover of grasses
Plant species patchy distributed

→ Intensification or encroachment

Biodiversity

Land-use change → Semi-natural grasslands in lowland





Wehn and Johansen 2016 The multiple roles of grassland in the European bioeconomy

Biodiversity

Land-use changes:

Huge negative effect on Norwegian biodiversity!

1/3 of all red listed species are associated with agricultural land

Definition of semi-natural habitat type:

- **No artificial fertilisers**
- **No ploughing (for a long time)**
- **No reseeding (for a long time)**
- **Managed by extensive agricultural land-use**

Management action

Aim:

Maintain all hay meadows of high biological value

The Project

Integrating scientific and traditional knowledge in adaptive management of semi-natural hay meadows

(*Tilpasset skjøtsel av verdifulle slåttemarker basert på brukererfaringer og tradisjonell og forskningsbasert kunnskap; ENGKALL)*

Funded by the Norwegian Research Council

A cooperation between NIBIO and Centre for Rural Research, Norway

The questions asked

1) Does time of mowing matter?

2) Does the surrounding landscape matter?

Phenology measurements

- the week before predefined cutting dates -the Norwegian study area

- abundance of blooming plants -the Romanian study area

Plant species distribution in the surrounding landscape

The methodology

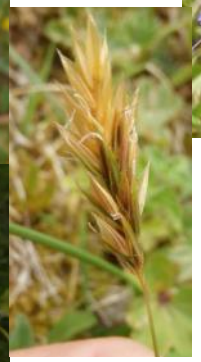
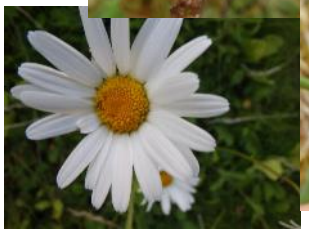
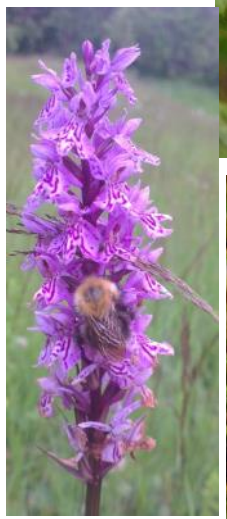
34 species

1) Does time of mowing matter?

Phenology measurements

- the week before predefined cutting dates -the Norwegian study area










The methodology

1) **Does time of mowing matter?**
2) **Does the surrounding landscape matter?**

Phenology measurements

- abundance of blooming plants -the Romanian study area

Early mowing

Recent mowing

Late mowing

The methodology

2) Does the surrounding landscape matter?

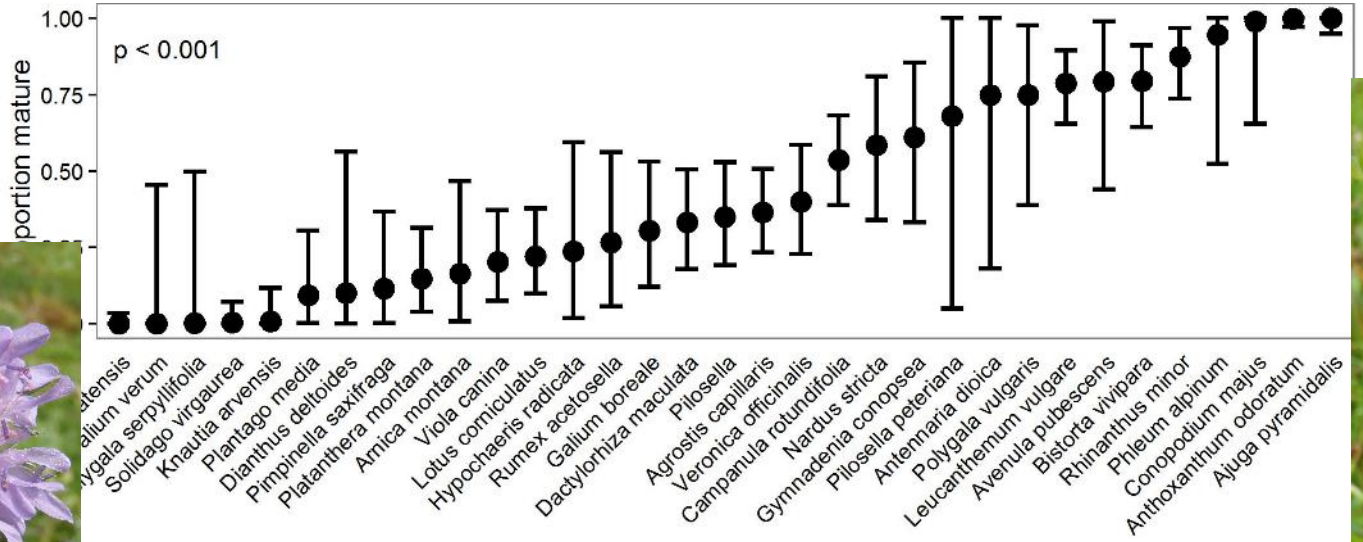
Plant species distribution in the surrounding landscape

The answers

1) Does time of mowing matter?

Phenology measurements

- the week before predefined cutting dates -the Norwegian study area



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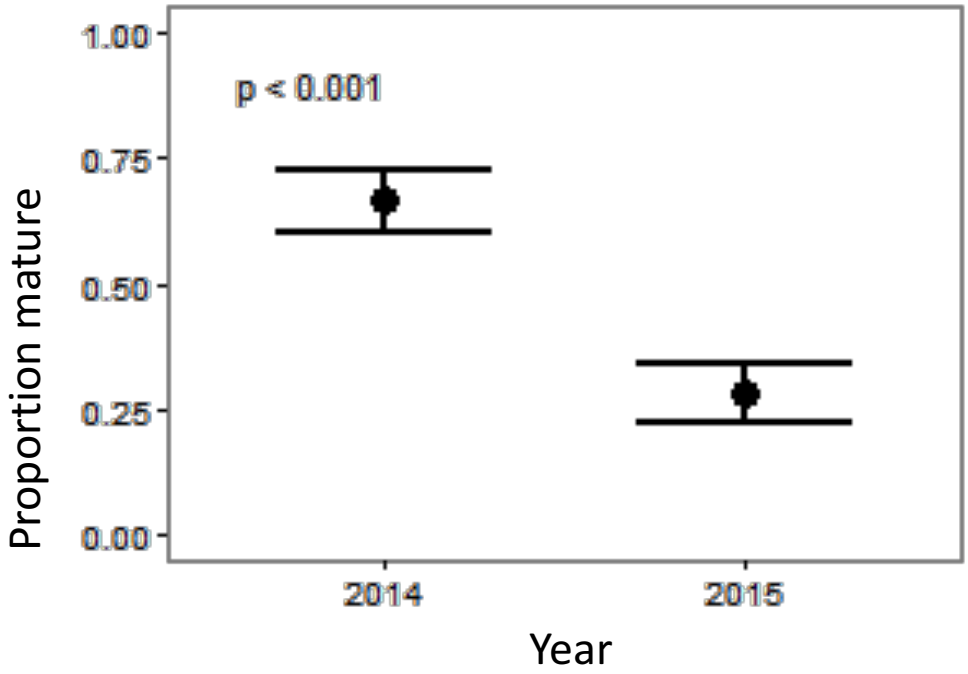

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1) **Does time of mowing matter?**
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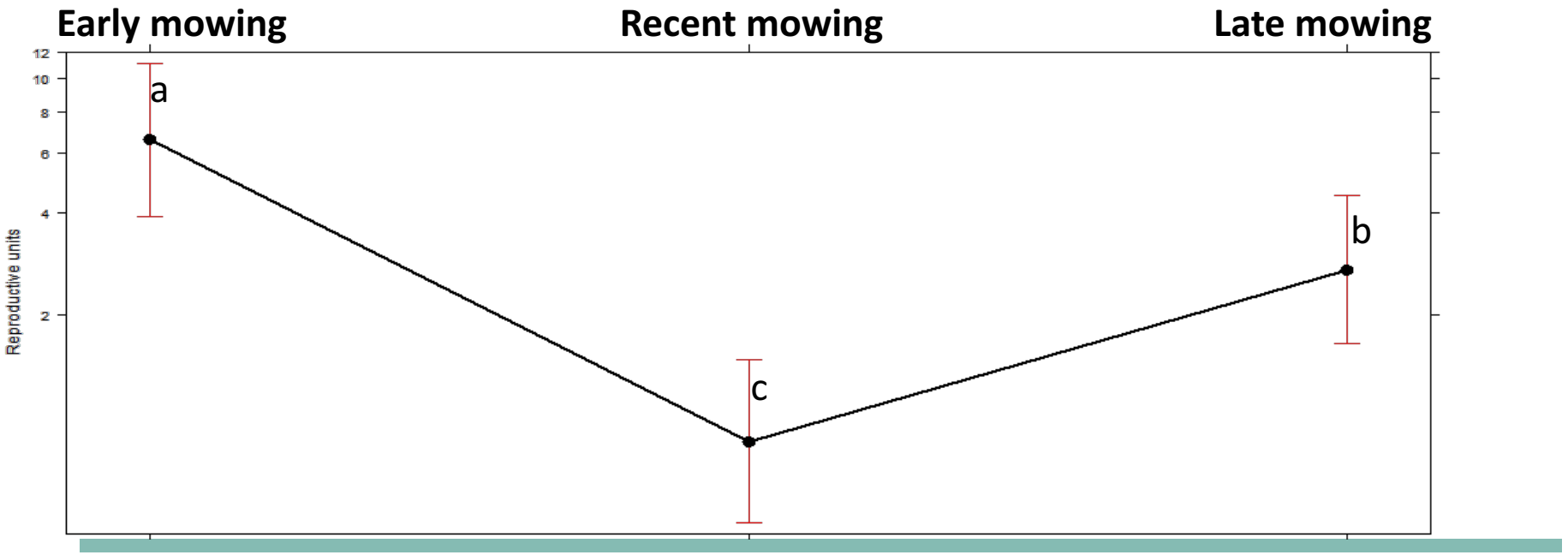


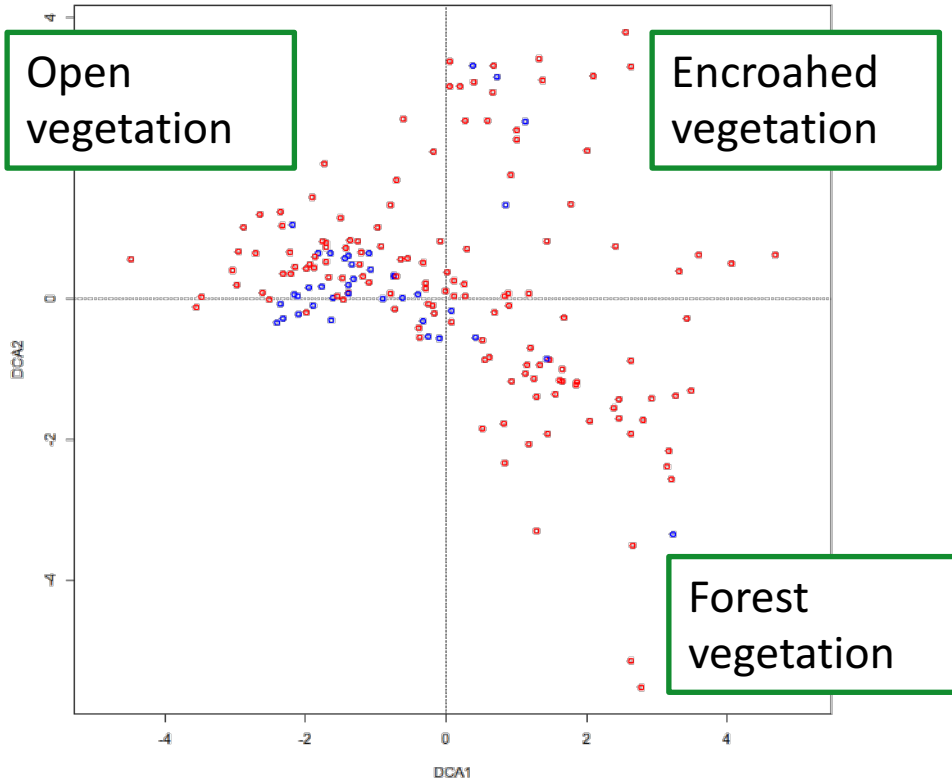
The answers

2) Does the surrounding landscape matter?

- Plant species distribution in the surrounding landscape

o: Semi-natural grassland associated species

o: all the other species

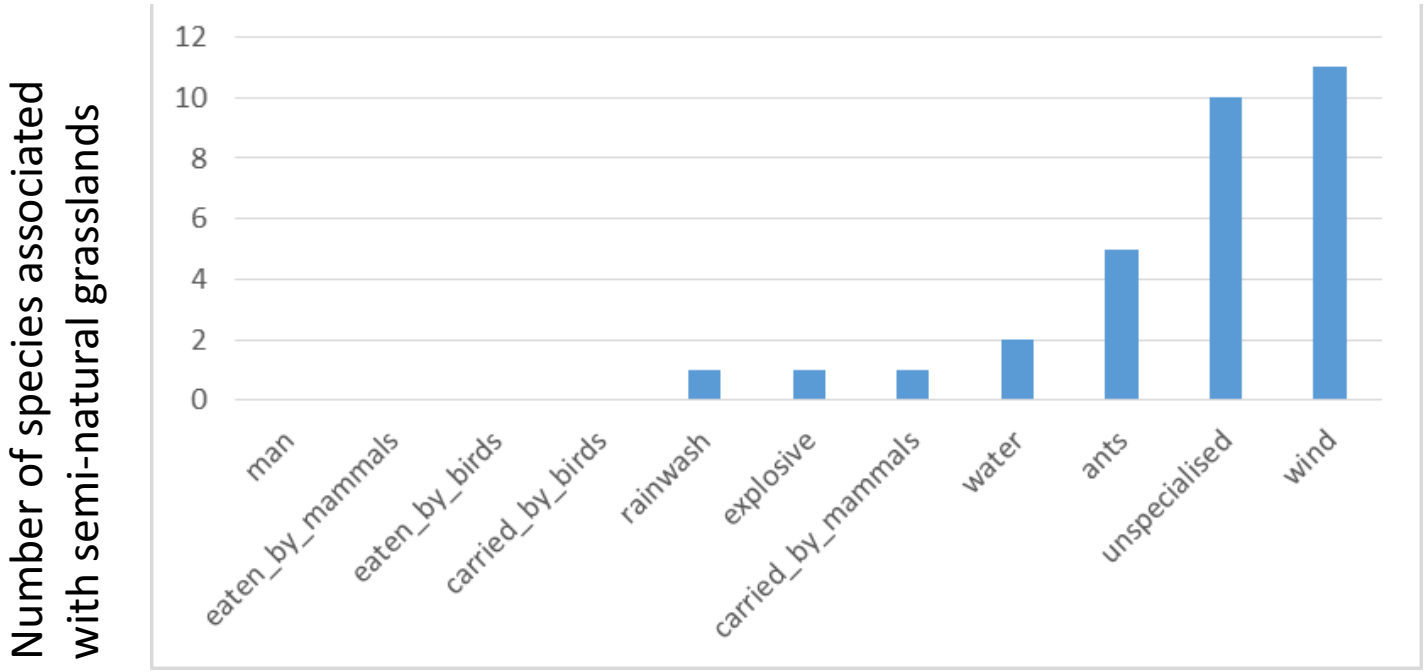


The answers

2) Does the surrounding landscape matter?

- Plant species distribution in the surrounding landscape

→ In relation to seed dispersion vectors

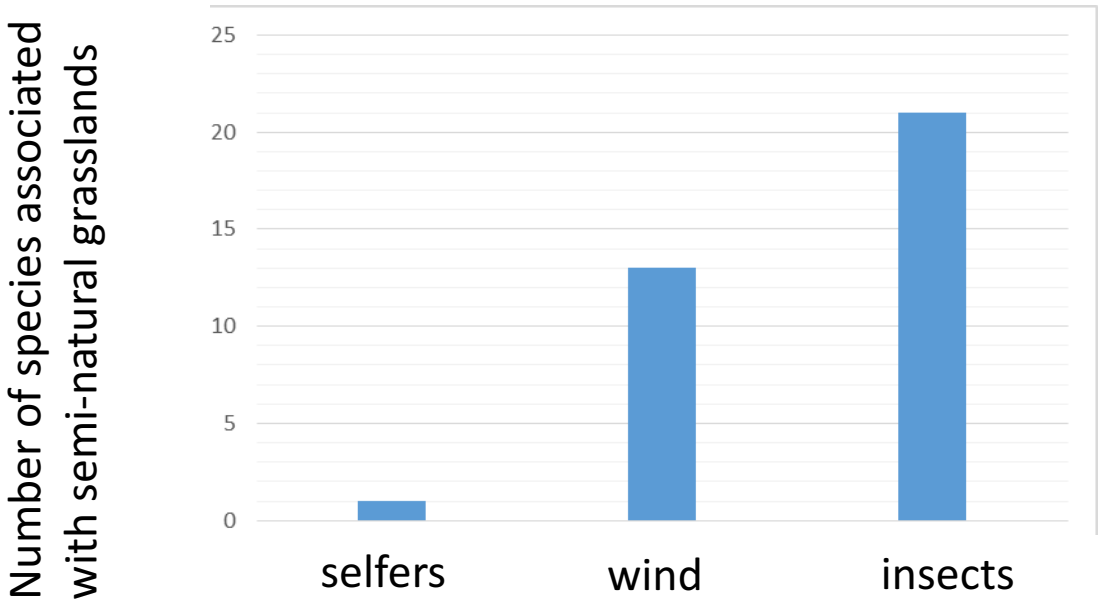


The answers

2) Does the surrounding landscape matter?

- Plant species distribution in the surrounding landscape

→ In relation to pollinators



CONCLUSION

TIMING MATTER

- THE BEST MANAGEMENT ACTION IS TO DO MOWING AT DIFFERENT TIMES

LANDSCAPE MATTER

- FOREST ACT AS A BARRIER FOR THE DISPERSAL OF THE SEMI-NATURAL GRASSLAND ASSOSIATED SPECIES