Berner Fachhochschule
Haute école spécialisée bernoise
Bern University of Applied Sciences

Control of Fleabane in extensive pastures

Rahul Pannu, Alexandra Schöder*, Fabio Mascher

- School of Agricultural, Forest and Food Sciences HAFL
- *Pflanzenschutzfachstelle Kanton Bern LANAT

Kanton Bern
Canton de Berne

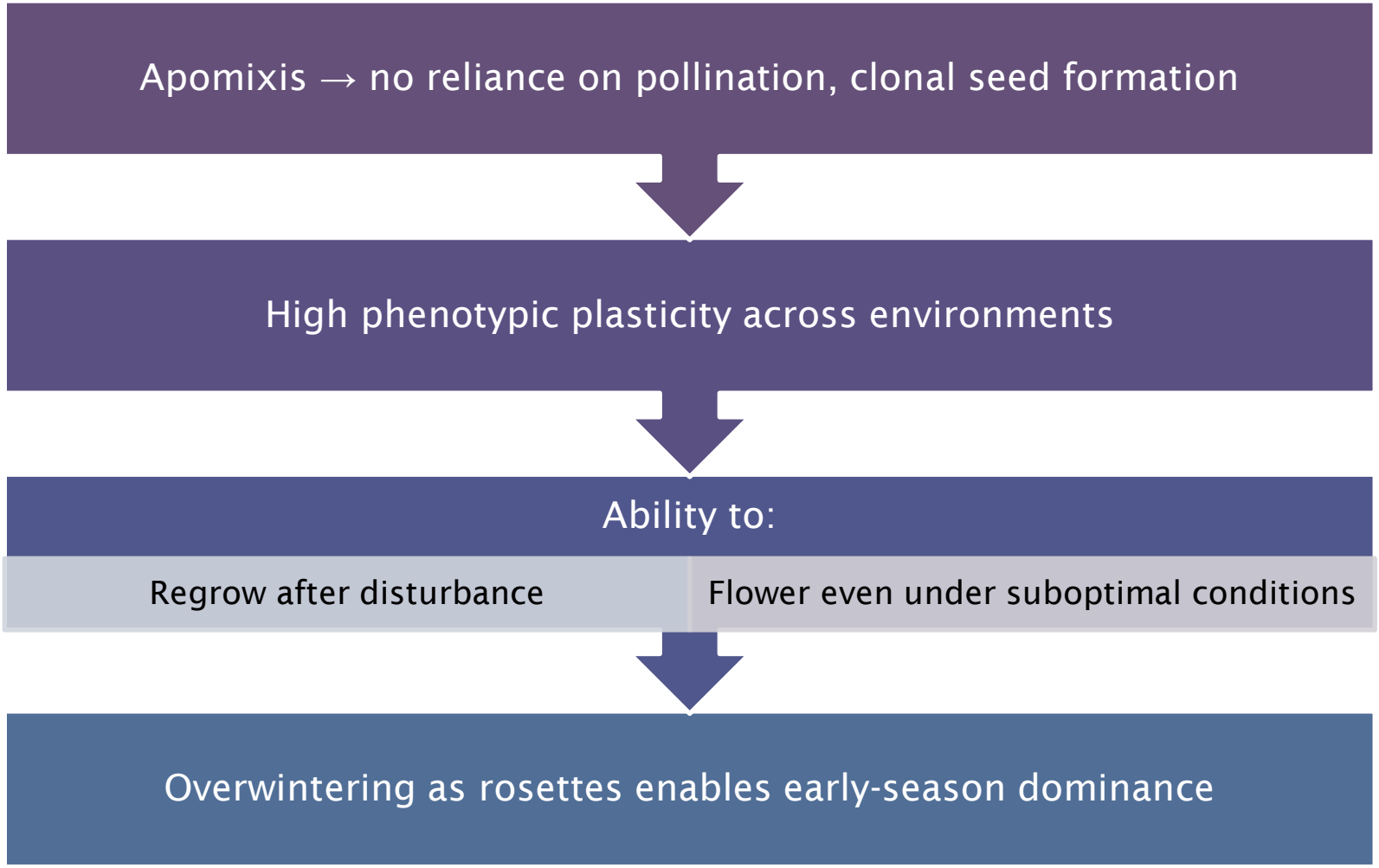
WHY FLEABANE IS A PROBLEM

Strong competitor in grasslands:
Outcompetes native species, reducing biodiversity and altering vegetation structure

High reproductive capacity:
Produces large numbers of wind-dispersed seeds, enabling rapid spread and reinfestation.

High ecological adaptability:
Establishes and persists across extensive meadows, pastures, and disturbed habitats

BIOLOGICAL TRAITS DRIVING PERSISTENCE



OBJECTIVE

To identify and evaluate sustainable control options for *Erigeron annuus* in extensive meadows by studying:

Growth patterns and biomass allocation

Response to different management strategies

Effectiveness of cultural and chemical control methods

RESEARCH QUESTIONS

How do growth stage and biomass allocation in *Erigeron annuus* influence vulnerability to control?

How effective are different control strategies - cultural methods in the field and herbicides under controlled conditions - when applied at specific growth stages?

METHODOLOGY

Overall Study Design

Field experiments in extensive meadows to evaluate cultural control methods

Controlled pot experiments to assess growth-stage-dependent herbicide response

Biomass analysis to link plant development with control susceptibility

METHODOLOGY

Field Experiments – Cultural Control

Study Sites

- Three extensive meadow farms with fleabane infestations.

Treatments

- **Grazing** (farmer practice)
- **Mowing** (fenced plots)
- **Hand Weeding** (fenced plots)
- **Mowing + Sheep Grazing** (one site)





Measurements

- **Flebane Density** (10 × 10 m subplots)
- **Repeated Counts** over the Growing Season
- **Rosette Density** in Late Autumn




Controlled Experiments – Herbicides & Biomass

Herbicide Efficacy (Pot Experiment)

Two Growth Stages:

1. Stem Elongation
2. Bud Formation

Six Treatments (5 Herbicides + Water Control)

Plant Response Assessed Over Time

Injury & Mortality

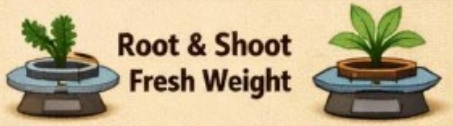
Time Points

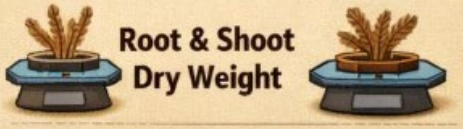
Biomass Analysis

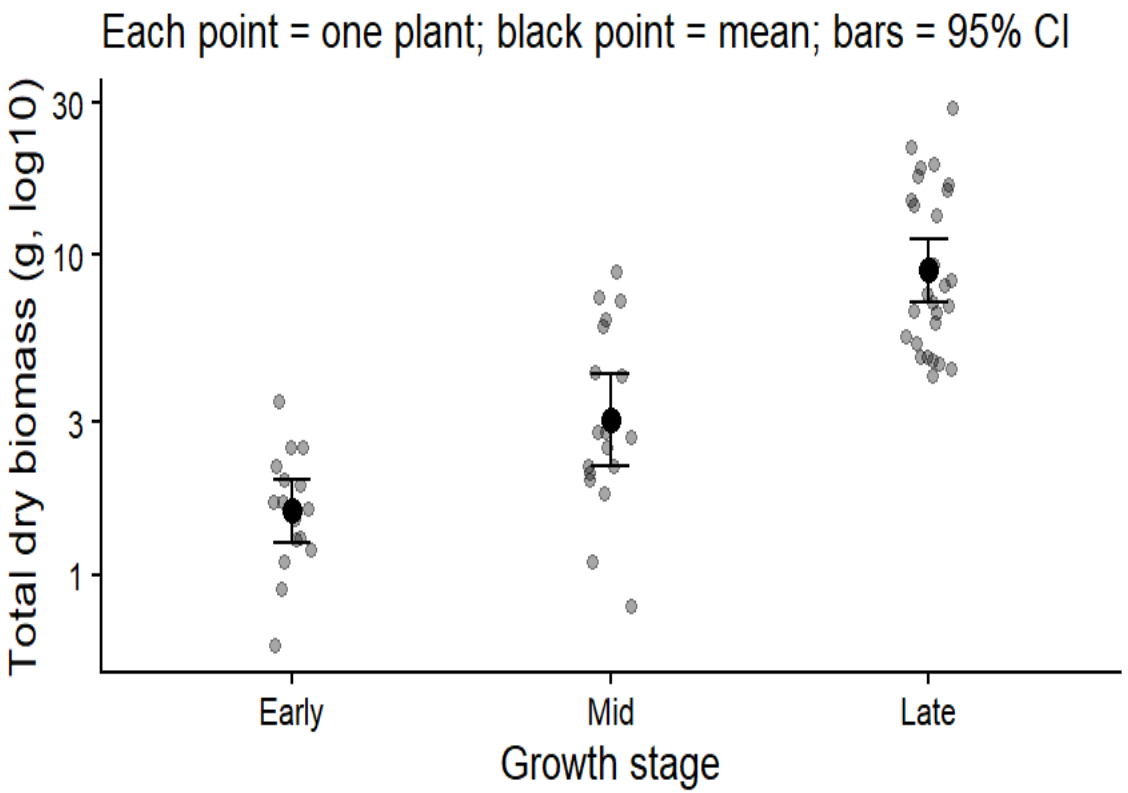
Plants Sampled at Three Developmental Stages

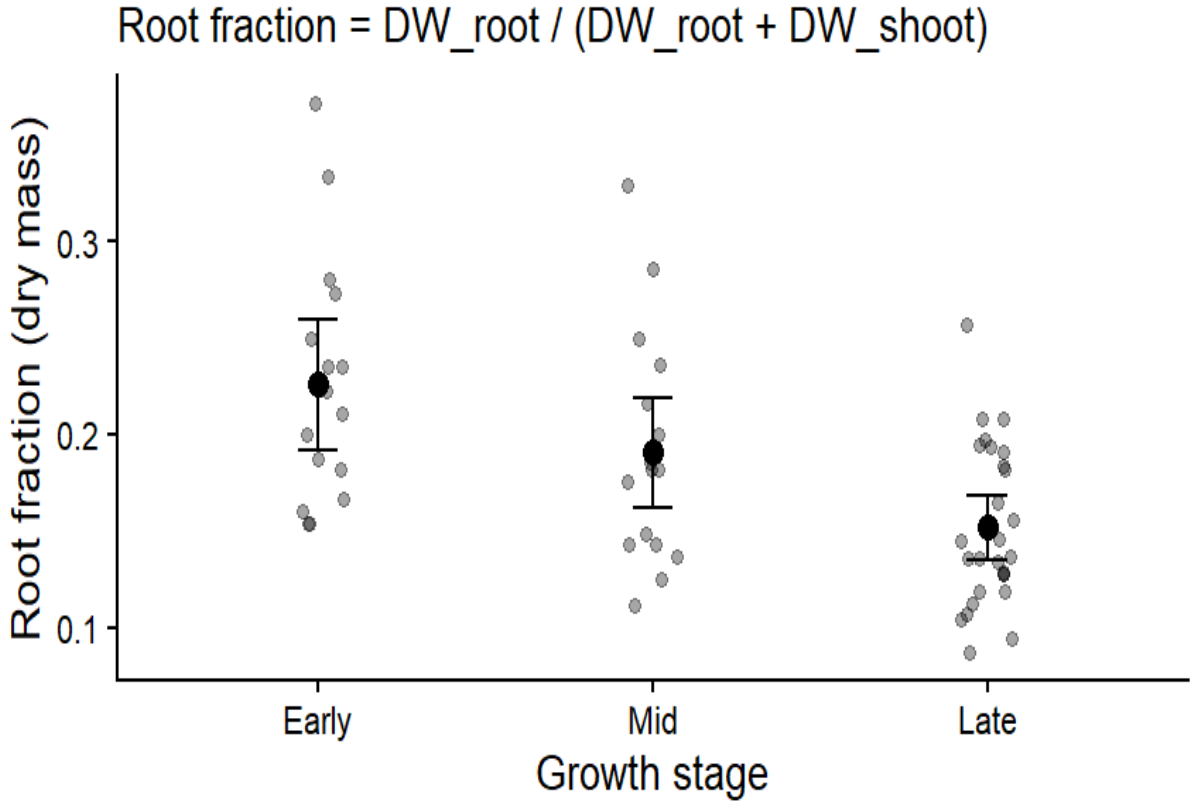
Early Mid Late

Measurement of:






Each point = one plant; black point = mean; bars = 95% CI
Total dry biomass (g, log10)
30
10
3
1
Early
Mid
Late
Growth stage


Root fraction = DW_root / (DW_root + DW_shoot)
Root fraction (dry mass)
0.3
0.2
0.1
Early
Mid
Late
Growth stage

RESULTS I

Biomass accumulation and allocation across growth stages

Key results

- Total plant biomass increased strongly from early to late developmental stages
- Later growth stages showed a lower relative allocation to roots
- Root fraction declined as plants shifted towards shoot and reproductive growth

Interpretation

- Increased aboveground biomass at later stages supports rapid regrowth after disturbance
- Reduced relative root allocation may alter herbicide uptake and translocation efficiency

FIELD OBSERVATIONS & MANAGEMENT IMPLICATIONS

Repeated control is required to prevent seed production

Glauser farm

- Fleabane outgrew meadow species after mowing
- Regrowth occurred after repeated mowing
- Plants still flowered despite multiple cuts

Wenger farm

- Extremely aggressive regrowth after grazing
- Stress induced flowering rather than suppression
- Mowing + grazing did not prevent flower production

Rufer farm

- Lower infestation pressure
- Single intervention largely suppressed growth
- Rosettes still present, indicating persistence

FIELD RESULTS

Infestation pressure and regrowth differ among farms

General observations

- Initial infestation pressure varied strongly between sites
- Fleabane regrew rapidly after disturbance at all sites
- Rosette formation indicated high reinfestation potential

SYNTHESIS AND CONCLUSIONS

Linking controlled experiments and field observations

Integrated findings

- High phenotypic plasticity enables rapid recovery after disturbance
- Later growth stages reduce control efficacy
- Cultural control without repetition fails to prevent reproduction

Practical implication

- Control strategies must be:
  - Timely
  - Repeated
  - Focused on seed prevention rather than biomass reduction

Berner Fachhochschule
Haute école spécialisée bernoise
Bern University of Applied Sciences

Contact details

Rahul Pannu: **rahul.rahul@students.bfh.ch**
Alexandra Schröder: **alexandra.schroeder@be.ch**
Fabio Mascher: **fabio.mascher@bfh.ch**