RECOVERY OF GRASSLAND BIODIVERSITY BY SEED MIXTURES IN EUROPE: APPLICATION CIRCUMSTANCES AND PROBLEMS

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Grasslands have been in decline in Europe in the last few decades

- **Decrease in area** — afforestation or transformation to croplands
- **Decrease in richness**
  - **Lowland areas in the West**
    - Agricultural intensification and fragmentation
  - **Mountain areas both in the East and West**
    - Abandonment
RECOVERY OF GRASSLANDS

- In Western countries the reuse of fallow lands is typical (but there are sown margins 😊)
- In Eastern countries between 1990 and 2004 about 10-20% of former croplands were abandoned
- This means for Hungary about 600,000 hectares
- This provides a great opportunity and space for grassland restoration in the Eastern countries

The selection of the proper grassland restoration method is determined by:
- Aims of restoration
- Site conditions and time
- Availability of seed sources
- Availability of manpower and financial sources

The most frequently applied grassland restoration measure is sowing low to high diversity seed mixtures

Types of seed mixtures

- **Low diversity seed mixtures**
  - Common grasses and forbs

- **High diversity seed mixtures**
  - Also rare species included
LOW DIVERSITY SEED MIXTURES

- **Benefits**
  - Cost effective
  - Easy to compile
  - Available commercially
  - Fast recovery of grasses dominated vegetation
  - Effective weed suppression

LOW DIVERSITY SEED MIXTURES

- **Drawbacks**
  - Species poor vegetation
  - „Football field”
  - Fast accumulation of litter
  - Improvement of species richness required

HIGH DIVERSITY SEED MIXTURES

- **Benefits**
  - High species richness
  - Fast recovery of species-rich vegetation
  - Effective weed suppression

HIGH DIVERSITY SEED MIXTURES

- **Drawbacks**
  - High costs
  - Problematic to compile
  - Unavailable commercially
  - Uncertainty in composition

OPEN QUESTIONS

- **Composition of mixtures**
  - Which, and how many species?
    - What man can find, is generally included
    - As much species as possible (?!)
    - Grasses vs. forbs?
    - How effective is spontaneous regeneration in the landscape?

- **Density**
  - In ecological restoration generally 4 to 40 kg/ha
  - Much higher figures are typical in agriculture

- **Post restoration management**
RESTORATION IN EAST AND WEST

- WESTERN COUNTRIES
  - Well developed seed market
    (seeds of local provenance)
  - Many published case studies and experience in seed production
  - Subsidies for seed production and restoration
  - Donor site registers for restoration
  - Highly fragmented and intensively managed grasslands
    (Which makes the study of spontaneous processes difficult)
EASTERN COUNTRIES

- In most countries even the seeds of foundation species are unavailable (regionally produced or harvested)
- Promising case studies (but rather unpublished)
- Missing experience in seed production of grassland forbs
- Not sufficient subsidies for grassland restoration
- Missing donor site registers for restoration
- BUT there are still large unimproved grassland areas
KNOWLEDGE TRANSFER

What can we learn from each other?

- Transfer of evidence based experiences
  - Failures in restoration (successes are often published 😊)
  - Experiences in restoration planning
  - Seed collection and propagation techniques
- Experiences in public dissemination of results
- Joint proposals and large-scale approaches
- Species dynamics in unique grassland types
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