Origin and development of European grasslands
- Steppe-like grasslands in the Palearctic – around 5 million years old
- Continuous existence in Europe since the Pleistocene (the last 2.4 million years)
- Spatial expansion and retreat during the Pleistocene ice cycles
- Emergence of semi-natural grasslands in Holocene 5000-7000 years ago

**Festucion valesiacaee**
(Subcontinental steppic grasslands): several million years old

**Arrhenatherion elatioris**
(Lowland hay meadows): several hundred years old
• **large species pool** including forest steppe-, hemiboreal-, submediterranean elements (Roleček et al. 2014)
  - many species are relics of periglacial steppes (drought resistant)

• **human management providing open habitats**
  - long duration (Hájková et al. 2011) since the Neolithic period
  - low-intensity utilization of grasslands without fertilization
    • important on better soils: reduces asymmetry in light concurrency (Lepš 1999)
    • tricky traditional management systems for sustainable utilization (Babai et al. 2014, Babai & Molnár 2014)
  - large-area grazing or transhumance promoted high distance species dispersal (Poschlod & al 1996, Hornberger 1959)
neolithic (ca 7000 bP)

- **grazing** (forest-steppe zone; fire clearing)
- winter feed: mainly **pollarding** of deciduous trees
- haymeadows? **mowing** and also other types of recently widely used management (manuring of remote areas) have very recent origin
Abb. 4: Bewirtschaftungsschema der drei wichtigsten Wiesentypen der alten Dreizelgenwirtschaft.
Abb. 2: Rinder-Hutweide auf einer Wiese im Harz (aus AG Harzer Rotvieh, 1998; mit freundlicher Ge-
nehmigung Papierflieger, Clausthal-Zellerfeld).
- Scythe first mentioned in the 5th century BC (used for coppicing)
- Manuring of more remote areas since the half of the 19th century
- Use of artificial fertilizers started in the 20th century

Spread of competitively strong grass species: *Arrhenatherum elatius*, *Dactylis glomerata*, *Festuca pratensis*, *Phleum pratense*, *Alopecurus pratensis*
Recently, semi-natural grassland is the most widespread grassland type in Europe covering 10-15% of the total surface and about one third of the utilized agricultural area.

HNV (high nature value) grasslands – only a very small fraction of this area!