App. 1. The upland site was located on a ridge that was originally forested prior to European settlement. The site is on fine-silty mixed soils (order Fragiudalf) (Herman 1979) and was converted from an agricultural field to a fescue (*Festuca arundinacea*) horse pasture for 20 years before abandonment in 1987, after which it was mowed semi-annually. The lowland site was located in a 1.2 ha bottomland last planted in 1987 with *Sorghum bicolor* ssp. *drummondii*. The soil is a Bonnie Silt Loam, a fine-silty, mixed acid, mesic Typic Fluvaquent (Herman 1979) that was poorly drained and subject to frequent and sustained flooding from November through May.

Both sites were prepared in June 1996. The upland site was disked and remaining woody plant stems removed by hand. The lowland site was plowed and disked. Each field was divided into eight (upland site) or 16 (lowland site) 225 m² square blocks; each block consisted of nine 25-m² square plots assigned to all crossed combinations of three levels each of disturbance and fertilizer. Granular fertilizer was hand broadcast to obtain a productive pasture based upon an initial fertilizer test at both sites (H. Olsen pers. comm.). The treatments were no fertilizer (control), 1st year only (and again in 2001 at the upland site only), and annual fertilizer. At the upland site, the fertilized plots were treated in the spring with 154 kg.ha⁻¹ of K₂CO₃, 122 kg.ha⁻¹ of (NH₄)₂HPO₄, and in the spring and autumn with 140 kg.ha⁻¹ of NH₄NO₃. At the lowland site the fertilized plots were treated in the spring with 48 kg.ha⁻¹ of K₂CO₃, 8 kg.ha⁻¹ of (NH₄)₂HPO₄, and in the spring and autumn with 23 kg.ha⁻¹ of NH₄NO₃. These levels produced a productivity gradient significantly affecting biomass (Mathis 2001; Spyreas et al. 2001; Brandon et al. 2004). Disturbance treatments were applied in three levels. At the upland site, spring mowing was not possible because of flooding, and the disturbances were: no disturbance, mowed in the summer annually, and mowed and rototilled in the summer annually. The disturbances provided a severe gradient ranging from maintenance of early successional grassland in the mowed and/or rototilled plots to conditions allowing woody species invasion in the undisturbed plots.

Reference

Herman, R.J. 1979. Soil Survey of Jackson County, Illinois. National Cooperative Soil Survey, Washington, DC, US.



App. 2. Core species in the upland old-field in the seed bank (SB) and aboveground vegetation from 1996-2002 considered at the block scale. C = recorded as a core species (\geq 90% of plots); S = satellite species (\leq 10% of plots) in above-ground vegetation. \dagger = occurred as non-core species in the seed bank. Species are listed alphabetically following appearance in the seed bank and the first year in which they appear in the vegetation as a core species. * = exotic in the US (Mohlenbrock 2002).

	SB	1996	1997	1998	1999	2000	2001	2002
Ambrosia artemisiifolia	С	С	С		С	С		
Oxalis stricta	С	С	С			С	С	
Acalypha virginica	ŧ	С	С					С
Ageratina altissima		С						
Bidens frondosa		С						
Cirsium vulgare*		С	С					
Conyza canadensis		С						
Festuca arundinacea*		С	С	С	С	С	С	С
Erechtites hieracifolia		С						
Lespedeza cuneata*	†	С	С	С	С	С	С	С
Setaria faberi*		С			С	С	С	С
Solidago canadensis	†	С	С	С	С		С	С
Tridens flavus		С	С	С	С	С	С	С
Verbena hastata*		С						
Barbarea vulgaris*		S	С				S	S
Cardamine parviflora			С					
Desmodium paniculatum			С	С	С	С	С	С
Setaria glauca			С				С	С
Trifolium repens*	S	S	С					
Eupatorium serotinum	ŧ			С				S
Panicum anceps				С	С	С	С	С
Solanum carolinense				С	С	С		
Cardamine hirsuta*					С	С	С	С
Desmodium canescens					С			
Rumex crispus*			S		С			
Veronica arvensis						С	С	С
Allium vineale*					С		С	С
Number of core species	2	14	13	8	13	11	12	12



App. 3. Core species in the lowland old-field in the seed bank (SB) and above-ground vegetation from 1996-2002 considered at the block scale. C = recorded as a core species (\geq 90% of plots); S = satellite species (\leq 10% of plots) in aboveground vegetation. \dagger = occurred as non-core species in the seed bank. Species are listed alphabetically following appearance in the seed bank and the first year in which they appear in the vegetation as a core species. * = exotic in the US (Mohlenbrock 2002).

	SB	1996	1997	1998	1999	2000	2001	2002	
Cyperus erythrorhizos	С	С	С	С	С	С	С	С	
Solidago canadensis	С	С	С	С	С	С	С	С	
Digitaria ischaemum*	С	С	С	С	С			С	
Cardamine hirsuta*	С		С	С	С	С			
Cerastium viscosum*	С		С					С	
Lespedeza striata*	С		С		С	С	С		
Hypericum mutilum	С			С					
Erigeron philadelphicus	С		S			С	С	С	
Eupatorium coelestinum	С					С	С		
Cerastium fontanum	С			S			С		
Oxalis stricta	С						С		
Ranunculus arborvitus	С						С	S	
Acalypha rhomboidea	С				S				
Callitriche terrestris	С		S						
Conyza canadensis	С							S	
Eclipta prostrata	С							S	
Gratiola neglecta	С								
Krigia biflora	С								
Plantago major*	С			S		S			
Rorippa islandica	С								
Sibara virginica	С			S					
Veronica arvensis	С					S			
Chamaesyce nutans		С	С	С	С	С	С		
Sorghum halepense*	S	С	С						
Urochloa platyphylla	S		С	С	С	С			
Bromus secalinus*	S		С	S		S			
Persicaria lapthifolia	ŧ			С	С			С	
Fraxinus pennsylvanica					С	С	С	С	
Valerianella radiata	ŧ				С	С	С	С	
Geranium carolinianum		S				С		С	
Paspalum laeve				S	S		С	С	
Plantago rugelii				S			S	С	
Galium aparine								С	
Myosotis verna/macrosperma								С	
Ranunculus hispidus								С	
Trifolium aureum*								С	
Number of core species	22	5	10	8	10	11	11	14	

