

Life history traits of exotic and native species determine grassland management outcomes following prescribed fire

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Table S1. List of plant species recorded in the plots. We indicate their photosynthetic pathway, native status, growth form, and mean percent cover.

Species	Photosynthetic pathway	Native Status	Growth form	Percent cover (%)
<i>Sorghum halepense</i>	C ₄	Exotic	Grass	23.97
<i>Solidago canadensis</i>	C ₃	Native	Forb/Vine	18.98
<i>Schedonorus arundinaceus</i>	C ₃	Exotic	Grass	17.92
<i>Andropogon virginicus</i>	C ₄	Native	Grass	16.69
<i>Rubus argutus</i>	C ₃	Native	Shrub	10.43
<i>Desmanthus illinoensis</i>	C ₃	Native	Forb/Vine	8.80
<i>Toxicodendron radicans</i>	C ₃	Native	Forb/Vine	6.08
<i>Daucus carota</i>	C ₃	Exotic	Forb/Vine	4.70
<i>Eupatorium serotinum</i>	C ₃	Native	Forb/Vine	3.13
<i>Campsis radicans</i>	C ₃	Native	Forb/Vine	2.72
<i>Trifolium pratense</i>	C ₃	Exotic	Forb/Vine	2.54
<i>Andropogon glomeratus</i>	C ₄	Native	Grass	2.35
<i>Symphotrichum pilosum</i>	C ₃	Native	Forb/Vine	2.27
<i>Ratibida pinnata</i>	C ₃	Native	Forb/Vine	2.19
<i>Asclepias viridis</i>	C ₃	Native	Forb/Vine	2.03
<i>Iva annua</i>	C ₃	Native	Forb/Vine	1.90
<i>Eragrostis capillaris</i>	C ₄	Native	Grass	1.56
<i>Oenothera speciosa</i>	C ₃	Native	Forb/Vine	1.51
<i>Erigeron strigosus</i>	C ₃	Native	Forb/Vine	1.42
<i>Galactia volubilis</i>	C ₃	Native	Forb/Vine	1.38
<i>Medicago minima</i>	C ₃	Exotic	Forb/Vine	1.38
<i>Setaria parviflora</i>	C ₄	Native	Grass	1.28
<i>Symphotrichum ericoides</i>	C ₃	Native	Forb/Vine	1.19
<i>Ambrosia trifida</i>	C ₃	Native	Forb/Vine	1.15
<i>Silphium laciniatum</i>	C ₃	Native	Forb/Vine	1.09
<i>Cirsium horridulum</i>	C ₃	Native	Forb/Vine	0.99
<i>Carex cherokeensis</i>	C ₃	Native	Grass	0.97
<i>Plantago lanceolata</i>	C ₃	Exotic	Forb/Vine	0.97
<i>Berchemia scandens</i>	C ₃	Native	Forb/Vine	0.92
<i>Panicum capillare</i>	C ₄	Native	Grass	0.85
<i>Cornus drummondii</i>	C ₃	Native	Shrub	0.83
<i>Eupatorium altissimum</i>	C ₃	Native	Forb/Vine	0.81
<i>Euphorbia nutans</i>	C ₃	Native	Forb/Vine	0.78
<i>Rosa carolina</i>	C ₃	Native	Shrub	0.72
<i>Oenothera gaura</i>	C ₃	Native	Forb/Vine	0.68
<i>Chamaecrista fasciculata</i>	C ₃	Native	Forb/Vine	0.63
<i>Bromus catharticus</i>	C ₃	Exotic	Grass	0.60
<i>Juniperus virginiana</i>	C ₃	Native	Tree	0.55

<i>Ambrosia artemisiifolia</i>	C ₃	Native	Forb/Vine	0.54
<i>Smilax rotundifolia</i>	C ₃	Native	Forb/Vine	0.53
<i>Eupatorium purpureum</i>	C ₃	Native	Forb/Vine	0.53
<i>Glandularia bipinnatifida</i>	C ₃	Native	Forb/Vine	0.52
<i>Elymus virginicus</i>	C ₃	Native	Grass	0.47
<i>Rudbeckia hirta</i>	C ₃	Native	Forb/Vine	0.44
<i>Salvia lyrata</i>	C ₃	Native	Forb/Vine	0.40
<i>Tragia urticifolia</i>	C ₃	Native	Forb/Vine	0.36
<i>Ipomoea pandurata</i>	C ₃	Native	Forb/Vine	0.35
<i>Houstonia purpurea</i>	C ₃	Native	Forb/Vine	0.34
<i>Lindernia dubia</i>	C ₃	Native	Forb/Vine	0.34
<i>Celtis laevigata</i>	C ₃	Native	Tree	0.32
<i>Conoclinium coelestinum</i>	C ₃	Native	Forb/Vine	0.32
<i>Lonicera japonica</i>	C ₃	Exotic	Forb/Vine	0.30
<i>Lespedeza cuneata</i>	C ₃	Exotic	Forb/Vine	0.28
<i>Passiflora incarnata</i>	C ₃	Native	Forb/Vine	0.24
<i>Agalinis purpurea</i>	C ₃	Native	Forb/Vine	0.24
<i>Geranium carolinianum</i>	C ₃	Native	Forb/Vine	0.17
<i>Asclepias tuberosa</i>	C ₃	Native	Forb/Vine	0.14
<i>Dracopis amplexicaulis</i>	C ₃	Native	Forb/Vine	0.14
<i>Allium canadense</i>	C ₃	Native	Forb/Vine	0.13
<i>Helenium autumnale</i>	C ₃	Native	Forb/Vine	0.12
<i>Symphyotrichum novae angliae</i>	C ₃	Native	Forb/Vine	0.12
<i>Euphorbia corollata</i>	C ₃	Native	Forb/Vine	0.11
<i>Ranunculus fascicularis</i>	C ₃	Native	Forb/Vine	0.10
<i>Valerianella radiata</i>	C ₃	Native	Forb/Vine	0.09
<i>Fraxinus americana</i>	C ₃	Native	Tree	0.08
<i>Prunella vulgaris</i>	C ₃	Native	Forb/Vine	0.08
<i>Mimosa microphylla</i>	C ₃	Native	Forb/Vine	0.08
<i>Ampelopsis arborea</i>	C ₃	Native	Forb/Vine	0.06
<i>Ruellia caroliniensis</i>	C ₃	Native	Forb/Vine	0.06
<i>Verbena brasiliensis</i>	C ₃	Exotic	Forb/Vine	0.06
<i>Vicia sativa</i>	C ₃	Exotic	Forb/Vine	0.06
<i>Sphenopholis obtusata</i>	C ₃	Native	Grass	0.05
<i>Lythrum alatum</i>	C ₃	Native	Forb/Vine	0.04
<i>Ligustrum sinense</i>	C ₃	Exotic	Shrub	0.03
<i>Oxalis corniculata</i>	C ₃	Native	Forb/Vine	0.03
<i>Paspalum dilatatum</i>	C ₄	Exotic	Grass	0.03
<i>Vitis aestivalis</i>	C ₃	Native	Forb/Vine	0.03
<i>Lapsana communis</i>	C ₃	Exotic	Forb/Vine	0.02
<i>Monarda citriodora</i>	C ₃	Native	Forb/Vine	0.01
<i>Sabatia angularis</i>	C ₃	Native	Forb/Vine	0.01
<i>Sisyrinchium albidum</i>	C ₃	Native	Forb/Vine	0.01

<i>Galium aparine</i>	C ₃	Native	Forb/Vine	0.01
<i>Lolium multiflorum</i>	C ₃	Exotic	Grass	0.01

Table S2. Post-hoc results for pairwise burn treatment comparisons of the different measured variables.

Response variable	Sampling time	Treatment comparison	Estimate	Standard Error	Degrees of freedom	p-value
Native graminoids (C ₃)	May	Unburned-Spring burn	1.14	0.444	19	0.056
		Unburned-Summer burn	-0.94	0.324	19	0.028
		Spring burn-Summer burn	-2.08	0.427	19	< 0.001
	September	Unburned-Spring burn	-0.00018	0.001041	19	1.000
		Unburned-Summer burn	0.000252	0.001031	19	1.000
		Spring burn-Summer burn	0.000437	0.000987	19	1.000
	November	Unburned-Spring burn	2.14	0.642	19	0.011
		Unburned-Summer burn	-1.07	0.334	19	0.014
		Spring burn-Summer burn	-3.21	0.676	19	< 0.001
Exotic graminoids (C ₃)	May	Unburned-Spring burn	1.005	0.112	19	< 0.001
		Unburned-Summer burn	0.147	0.102	19	0.497
		Spring burn-Summer burn	-0.857	0.114	19	< 0.001
	September	Unburned-Spring burn	0.868	0.0812	19	< 0.001
		Unburned-Summer burn	0.182	0.072	19	0.061
		Spring burn-Summer burn	-0.686	0.0829	19	< 0.001
	November	Unburned-Spring burn	0.861	0.0912	19	< 0.001
		Unburned-Summer burn	0.127	0.0802	19	0.393
		Spring burn-Summer burn	-0.734	0.0928	19	< 0.001
Native graminoids (C ₄)	May	Unburned-Spring burn	-0.68	0.102	19	< 0.001
		Unburned-Summer burn	0.438	0.12	19	0.005
		Spring burn-Summer burn	1.118	0.112	19	< 0.001
	September	Unburned-Spring burn	-0.951	0.0887	19	< 0.001
		Unburned-Summer burn	0.455	0.1012	19	< 0.001
		Spring burn-Summer burn	1.406	0.0957	19	< 0.001
	November	Unburned-Spring burn	-0.899	0.0918	19	< 0.001
		Unburned-Summer burn	0.464	0.1066	19	0.001
		Spring burn-Summer burn	1.364	0.1004	19	< 0.001
Exotic graminoids (C ₄)	May	Unburned-Spring burn	-0.773	0.0914	19	< 0.001
		Unburned-Summer burn	0.38	0.107	19	0.006
		Spring burn-Summer burn	1.153	0.0989	19	< 0.001
	September	Unburned-Spring burn	-0.742	0.0859	19	< 0.001
		Unburned-Summer burn	0.507	0.0973	19	< 0.001
		Spring burn-Summer burn	1.249	0.0931	19	< 0.001
	November	Unburned-Spring burn	-0.76	0.0871	19	< 0.001
		Unburned-Summer burn	0.493	0.0999	19	< 0.001
		Spring burn-Summer burn	1.253	0.0946	19	< 0.001
Native forbs & vines	May	Unburned-Spring burn	-0.4331	0.341	19	0.660
		Unburned-Summer burn	-0.4463	0.342	19	0.622
		Spring burn-Summer burn	-0.0133	0.318	19	1.000
	September	Unburned-Spring burn	-0.0887	0.355	19	1.000
		Unburned-Summer burn	-0.9303	0.369	19	0.062
		Spring burn-Summer burn	-0.8415	0.355	19	0.085
	November	Unburned-Spring burn	-0.884	0.383	19	0.097
		Unburned-Summer burn	-2.129	0.433	19	< 0.001

		Spring burn-Summer burn	-1.245	0.426	19	0.026
Exotic forbs & vines	May	Unburned-Spring burn	-0.0647	0.192	19	1.000
		Unburned-Summer burn	-0.4408	0.182	19	0.076
		Spring burn-Summer burn	-0.3761	0.179	19	0.149
	September	Unburned-Spring burn	-0.0778	0.206	19	1.000
		Unburned-Summer burn	-0.6376	0.193	19	0.011
		Spring burn-Summer burn	-0.5598	0.19	19	0.025
	November	Unburned-Spring burn	0.854	0.251	19	0.009
		Unburned-Summer burn	0.263	0.215	19	0.707
		Spring burn-Summer burn	-0.59	0.262	19	0.109
Native trees and shrubs	May	Unburned-Spring burn	0.0785	0.165	19	1.000
		Unburned-Summer burn	-0.00279	0.162	19	1.000
		Spring burn-Summer burn	-0.08129	0.166	19	1.000
	September	Unburned-Spring burn	0.5393	0.161	19	0.010
		Unburned-Summer burn	0.0946	0.146	19	1.000
		Spring burn-Summer burn	-0.4448	0.163	19	0.040
	November	Unburned-Spring burn	0.3415	0.195	19	0.287
		Unburned-Summer burn	0.0155	0.182	19	1.000
		Spring burn-Summer burn	-0.3259	0.196	19	0.340
Exotic trees and shrubs	May	Unburned-Spring burn	-0.00018	0.001041	19	1.000
		Unburned-Summer burn	0.000252	0.001031	19	1.000
		Spring burn-Summer burn	0.000437	0.000987	19	1.000
	September	Unburned-Spring burn	-0.159	0.494	19	1.000
		Unburned-Summer burn	0.00000002	0.494	19	1.000
		Spring burn-Summer burn	0.159	0.494	19	1.000
	November	Unburned-Spring burn	-0.159	0.494	19	1.000
		Unburned-Summer burn	0.00000002	0.494	19	1.000
		Spring burn-Summer burn	0.159	0.494	19	1.000
Richness	May	Unburned-Spring burn	-0.0351	0.153	19	1.000
		Unburned-Summer burn	-0.0578	0.152	19	1.000
		Spring burn-Summer burn	-0.0227	0.151	19	1.000
	September	Unburned-Spring burn	-0.0254	0.159	19	1.000
		Unburned-Summer burn	-0.0976	0.156	19	1.000
		Spring burn-Summer burn	-0.0722	0.155	19	1.000
	November	Unburned-Spring burn	-0.076	0.159	19	1.000
		Unburned-Summer burn	-0.1236	0.157	19	1.000
		Spring burn-Summer burn	-0.0476	0.154	19	1.000
Exponential Shannon	May	Unburned-Spring burn	-0.345	0.434	19	1.000
		Unburned-Summer burn	-0.786	0.434	19	0.258
		Spring burn-Summer burn	-0.441	0.434	19	0.967
	September	Unburned-Spring burn	0.23	0.481	19	1.000
		Unburned-Summer burn	-1.02	0.481	19	0.140
		Spring burn-Summer burn	-1.25	0.481	19	0.052
	November	Unburned-Spring burn	-0.0946	0.375	19	1.000
		Unburned-Summer burn	-1.282	0.375	19	0.009
		Spring burn-Summer burn	-1.1874	0.375	19	0.015
Inverse Simpson	May	Unburned-Spring burn	-0.41	0.496	19	1.000
		Unburned-Summer burn	-0.799	0.496	19	0.371
		Spring burn-Summer burn	-0.389	0.496	19	1.000

	September	Unburned-Spring burn	0.553	0.543	19	0.964
		Unburned-Summer burn	-1.013	0.543	19	0.232
		Spring burn-Summer burn	-1.566	0.543	19	0.028
	November	Unburned-Spring burn	0.194	0.456	19	1.000
		Unburned-Summer burn	-1.297	0.456	19	0.031
		Spring burn-Summer burn	-1.491	0.456	19	0.012
Reproductive organs of <i>Sorghum halepense</i>	September	Unburned-Spring burn	-0.463	0.31	19	0.455
		Unburned-Summer burn	0.531	0.399	19	0.596
		Spring burn-Summer burn	0.993	0.37	19	0.044
Reproductive organs of <i>Schedonorus arundinaceus</i>	May	Unburned-Spring burn	1.0561	0.41	19	0.056
		Unburned-Summer burn	-0.0426	0.292	19	1.000
		Spring burn-Summer burn	-1.0986	0.408	19	0.043