

Supplementary file S3

Univariate test results of the effects of fertilizer dose (N dose), year (Y; 2018, 2021, 2022), site (S; Ilomantsi, Liperi) and their interactions on the abundance of ground vegetation species in the Scots pine stands. Statistically significant results are shown in bold text ($p \leq 0.05$).

Group	Species	N dose (N)		Year (Y)		Site (S)		N × Y		N × S		Y × S	
		Dev _{1,484}	<i>p</i>	Dev _{2,482}	<i>p</i>	Dev _{1,481}	<i>p</i>	Dev _{2,479}	<i>p</i>	Dev _{1,478}	<i>p</i>	Dev _{2,476}	<i>p</i>
Grasses	<i>Agrostis</i> sp.	4.70	0.663	8.37	0.361	9.37	0.051	1.16	1	2.79	0.757	5.82	0.668
	<i>Calamagrostis arundinacea</i>	1.08	0.996	0.72	1	166.09	0.002	5.29	0.982	0.37	0.987	18.53	0.019
	<i>Calamagrostis phragmitoides</i>	1.50	0.993	2.22	1	17.30	0.006	2.77	1	5.39	0.357	16.89	0.028
	<i>Deschampsia flexuosa</i>	1.85	0.993	66.99	0.001	36.32	0.003	5.31	0.982	2.63	0.757	12.16	0.15
	<i>Poa nemoralis</i>	12.12	0.03	3.30	0.991	23.97	0.003	0.50	1	0.00	0.996	0.00	1
Shrubs	<i>Calluna vulgaris</i>	1.67	0.993	19.78	0.006	18.37	0.005	1.32	1	5.28	0.372	5.79	0.668
	<i>Linnea borealis</i>	5.59	0.51	28.32	0.002	91.61	0.002	0.61	1	0.00	0.999	0.00	1
	<i>Salix</i> sp.	0.01	1	0.45	1	8.40	0.073	2.87	1	0.00	0.996	0.00	1
	<i>Vaccinium myrtillus</i>	3.15	0.902	3.91	0.969	2.40	0.706	0.09	1	0.15	0.995	13.39	0.097
	<i>Vaccinium vitis-idaea</i>	1.79	0.993	50.34	0.001	35.87	0.003	2.84	1	17.29	0.007	2.70	0.938
Herbs	<i>Carex brunnescens</i>	0.10	1	1.02	1	52.31	0.002	0.56	1	0.00	0.999	0.00	1
	<i>Carex digitata</i>	0.08	1	0.62	1	5.68	0.2	0.55	1	0.00	0.996	0.00	1
	<i>Carex globularis</i>	0.00	1	9.39	0.226	22.78	0.003	2.20	1	0.00	0.999	0.00	1
	<i>Convallaria majalis</i>	0.21	1	6.92	0.51	15.69	0.006	0.38	1	11.24	0.047	17.26	0.028
	<i>Dryopteris carthusiana</i>	11.39	0.048	0.08	1	82.59	0.002	0.46	1	6.28	0.272	2.25	0.938
	<i>Epilobium angustifolium</i>	1.18	0.996	1.92	1	0.68	0.789	11.03	0.355	6.46	0.264	2.92	0.938
	<i>Fragaria vesca</i>	12.05	0.031	1.25	1	8.49	0.071	0.00	1	0.01	0.995	0.00	1
	<i>Goodyera repens</i>	1.32	0.996	0.92	1	1.22	0.789	2.75	1	1.01	0.946	1.85	0.947

	<i>Gymnocarpium dryopteris</i>	7.98	0.208	1.10	1	14.93	0.009	1.85	1	1.75	0.879	0.36	0.982
	<i>Hierachium</i> sp.	0.00	1	11.90	0.11	7.96	0.092	0.46	1	1.27	0.946	0.74	0.977
	<i>Juncus effusus</i>	2.15	0.983	0.21	1	10.18	0.041	0.56	1	0.00	0.996	0.00	1
	<i>Luzula pilosa</i>	0.99	0.996	49.62	0.001	1.18	0.789	0.40	1	0.02	0.995	0.34	0.982
	<i>Maianthemum bifolium</i>	1.14	0.996	4.22	0.963	20.16	0.004	3.37	1	1.05	0.946	23.69	0.008
	<i>Melampyrum pratense</i>	49.12	0.001	23.43	0.003	6.97	0.129	3.48	1	12.18	0.036	26.42	0.006
	<i>Orthilia secunda</i>	2.67	0.964	11.81	0.11	11.37	0.024	0.03	1	0.00	0.996	0.00	0.99
	<i>Oxalis acetosella</i>	0.76	0.996	1.90	1	52.29	0.002	1.38	1	0.00	0.999	0.00	1
	<i>Potentilla erecta</i>	2.53	0.971	1.98	1	14.42	0.011	2.70	1	0.00	0.996	0.00	1
	<i>Pteridium aquilinum</i>	0.29	1	0.29	1	57.33	0.002	0.30	1	0.00	0.999	0.00	1
	<i>Rubus idaeus</i>	13.23	0.016	0.44	1	91.40	0.002	1.01	1	0.00	0.996	0.00	1
	<i>Rubus saxatilis</i>	3.26	0.902	0.35	1	5.06	0.247	0.32	1	2.48	0.757	2.79	0.938
	<i>Solidago virgaurea</i>	4.55	0.67	7.77	0.41	16.99	0.006	6.44	0.915	4.16	0.534	4.48	0.804
	<i>Stellaria media</i>	0.23	1	117.58	0.001	94.65	0.002	0.38	1	0.15	0.995	16.50	0.03
	<i>Trientalis europea</i>	0.01	1	141.13	0.001	1.97	0.706	0.06	1	4.01	0.539	6.12	0.668
	<i>Veronica officinalis</i>	3.75	0.844	0.66	1	13.64	0.014	1.07	1	0.00	0.996	0.00	1
	<i>Viola palustris</i>	1.70	0.993	4.47	0.929	7.48	0.106	1.05	1	0.00	0.995	0.00	0.982
Bryophytes	<i>Aulacomnium palustre</i>	13.35	0.016	9.51	0.226	12.65	0.016	3.34	1	5.65	0.346	43.04	0.004
	<i>Brachythecium</i> sp.	0.00	1	85.27	0.001	74.46	0.002	0.34	1	0.06	0.995	10.73	0.211
	<i>Dicranum</i> sp.	1.09	0.996	212.24	0.001	1.73	0.72	7.13	0.857	11.36	0.045	10.38	0.211
	<i>Hylocomium splendens</i>	50.31	0.001	28.91	0.002	0.01	0.941	3.61	1	3.99	0.539	1.54	0.964
	<i>Marchantiophyta</i> (hepatic)	0.01	1	18.42	0.007	15.17	0.006	2.26	1	0.00	0.999	0.00	0.982
	<i>Pleurozium schreberi</i>	2.62	0.966	64.29	0.001	13.93	0.013	7.82	0.788	27.65	0.001	0.99	0.977
	<i>Pohlia nutans</i>	10.03	0.088	5.45	0.82	6.92	0.129	0.25	1	0.00	0.996	0.00	0.99
	<i>Polytrichum</i> sp.	2.48	0.973	10.18	0.211	13.37	0.014	1.48	1	8.31	0.13	6.32	0.668
	<i>Ptilium crista-castrensis</i>	1.94	0.993	25.49	0.002	2.32	0.706	7.50	0.818	13.13	0.026	3.17	0.938
	<i>Rhodobryum roseum</i>	1.34	0.996	1.06	1	5.36	0.231	4.47	0.995	0.00	0.999	0.00	0.997
	<i>Sphagnum</i> sp.	0.01	1	0.14	1	49.34	0.002	0.50	1	0.02	0.995	4.60	0.804