

Supplementary material:

Table S1. Mean squares from three-way analysis of variance (ANOVA) for observed traits.

Source of variation	d.f.	LAI1	LAI2	SPADo1	SPADo2	SPADv1	SPADv2	yd	sh-v	no-p	no-gr	TGWo	TGWv	no-pod	no-sd
Repl stratum	3	0.023	0.0016	0.717	23.4	12.707	0.661	0.003	6.487	198.3	16.19	1.415	1.2478	108	0.059
Rotation variant	1	3.741***	0.1674*	75.313*	10.33	28.830*	29.965**	9.932***	4032***	1379.6	672.7**	17.209*	275.1787***	825,301***	0.707**
Residual 1	3	0.014	0.0128	4.211	4.69	2.271	0.835	0.0017	6.111	176.3	9.6	1.19	0.4472	2917	0.0065
Cultivar	1	0.012	0.3112**	6.844	165.27*	111.94**	33.292*	0.01	348**	134,690.7***	1075.66**	785.087***	72.9344**	260,780***	0.540*
Rotation × Cultivar	1	0.255**	0.2906**	6.003	545.85***	101.21**	109.128**	0.031	25.698	50613.4***	470.24**	14.345**	33.1026**	102,490***	1.234**
Residual 2	6	0.014	0.02	2.213	9.82	4.527	3.618	0.007	20.645	174.6	31.8	0.656	2.259	1973	0.086
Year	2	2.025***	56.765***	116.87***	1805.1***	8.679	304.26***	11.735***	12,306***	423,733.6***	295.42***	361.082***	429.6711***	770,053***	71.72***
Year × Rotation	2	0.401***	1.049***	26.145***	322.11***	46.730***	3.936	2.145***	135.1***	49,700.9***	231.49**	18.61**	15.7419***	151,653***	1.567***
Year × Cultivar	2	1.049***	0.8205***	86.223***	135.07***	22.962**	16.371***	0.221***	628.8***	165,880***	529.88***	8.936*	85.6993***	52,515***	0.426*
Year × Rotation × Cultivar	2	0.023	0.533***	70.383***	33.43	25.382**	89.314***	0.421***	314.7***	32,560.7***	174.65**	6.611	37.6166***	67,817***	0.314*
Residual 3	24	0.023	0.021	2.421	11.96	3.282	1.34	0.01448	7.183	298.1	24.85	2.607	0.9419	1925	0.076

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; d.f.—the number of degrees of freedom

Abbreviations: d.f.—number of degrees of freedom; LAI₁—leaf area index in the oats' tillering phase BBCH 29; SPAD_{o1}—relative chlorophyll content in the oats' tillering phase BBCH 29; SPAD_{v1}—relative chlorophyll content in vetches' leaves in the oats' tillering phase BBCH 29; LAI₂—leaf area index in the oats BBCH 71 phase; SPAD_{o2}—relative chlorophyll content in oats' leaves in the oats BBCH 71 phase; SPAD_{v2}—relative chlorophyll content in vetches' leaves in the oats BBCH 71 phase; yd—mixtures yield; sh-v—share of vetch in the mixture's yield; no-p—number of oats panicles per m²; no-g—number of oats grains per panicle; TGWo—thousand grain mass of oats; TGWv—thousand grain mass of vetch; no-pod—number of vetch pods per m²; no-sd—number of vetch seeds per pod.

Table S2. Correlation coefficients between the quantitative traits.

Trait	LAI1	LAI2	SPADo1	SPADo2	SPADv1	SPADv2	yd	sh-v	no-p	no-gr	TGWo	TGWv	no-pod
LAI2	0.578***												
SPADo1	-0.177	0.488***											
SPADo2	0.309*	-0.001	-0.136										
SPADv1	0.297	0.060	-0.175	0.541***									
SPADv2	0.262	0.611***	0.139	-0.494***	-0.089								
yd	0.528***	-0.098	-0.371**	0.650***	0.268	-0.346*							
sh-v	-0.274	0.377**	0.388**	-0.655***	-0.241	0.579***	-0.878***						
no-p	0.321*	-0.106	-0.398**	0.852***	0.517***	-0.484***	0.697***	-0.691***					
no-gr	0.339*	0.354*	0.323*	0.061	0.270	0.043	0.219	-0.056	-0.05				
TGWo	0.254	0.630***	0.426**	-0.139	0.244	0.355*	-0.219	0.371**	-0.119	0.571***			
TGWv	0.175	0.669***	0.344*	-0.082	0.165	0.493***	-0.488***	0.606***	-0.109	0.209	0.556***		
no-pod	-0.206	0.306*	0.261	-0.504***	-0.347*	0.337*	-0.786***	0.828***	-0.502***	-0.247	0.112	0.500***	
no-sd	0.429**	0.883***	0.428**	-0.268	0.036	0.715***	-0.358*	0.666***	-0.373**	0.331	0.599***	0.719***	0.527***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Abbreviations: LAI₁—leaf area index in the oats' tillering phase BBCH 29; SPAD_{o1}—relative chlorophyll content in the oats' tillering phase BBCH 29; SPAD_{v1}—relative chlorophyll content in vetches' leaves in the oats' tillering phase BBCH 29; LAI₂—leaf area index in the oats BBCH 71 phase; SPAD_{o2}—relative chlorophyll content in oats' leaves in the oats BBCH 71 phase; SPAD_{v2}—relative chlorophyll content in vetches' leaves in the oats BBCH 71 phase; yd—mixtures yield; sh-v—share of vetch in the mixture's yield; no-p—number of oats panicles per m²; no-g—number of oats grains per panicle; TGWo—thousand grain mass of oats; TGWv—thousand grain mass of vetch; no-pod—number of vetch pods per m²; no-sd—number of vetch seeds per pod.

Table S3. Mahalanobis distances between pairs of combinations of the three studied factors.

	1	2	3	4	5	6	7	8	9	10	11	12	
co-ce-12	1	0											
co-gr-12	2	44.43	0										
co-ce-13	3	63.18	37.98	0									
co-gr-13	4	62.57	36.37	18.99	0								
co-ce-14	5	62.97	51.51	40.72	40.34	0							
co-gr-14	6	62.69	51.34	38.25	38.46	11.73	0						
or-ce-12	7	15.08	38.13	55.43	55.13	54.85	54.95	0					
or-gr-12	8	24.82	29.5	43.09	42.54	51.61	50.77	17.35	0				
or-ce-13	9	74.44	51.42	18.65	22.11	48.4	44.62	66.26	53.62	0			
or-gr-13	10	71.53	52.89	26.19	28.41	46.09	41.39	63.02	51.23	20.52	0		
or-ce-14	11	78.26	57.63	29.89	30.01	32.86	31.82	68.1	59.36	26.37	27.87	0	
or-gr-14	12	77.85	58.42	33.82	33.03	31.57	28.76	67.44	59.09	30.96	26.99	12.16	0

$D_{\alpha}=59.75$

Abbreviations: co—conventional variant; or—organic variant; ce—Celer, gr—Grajcar; 12–14—years 2012–2014.

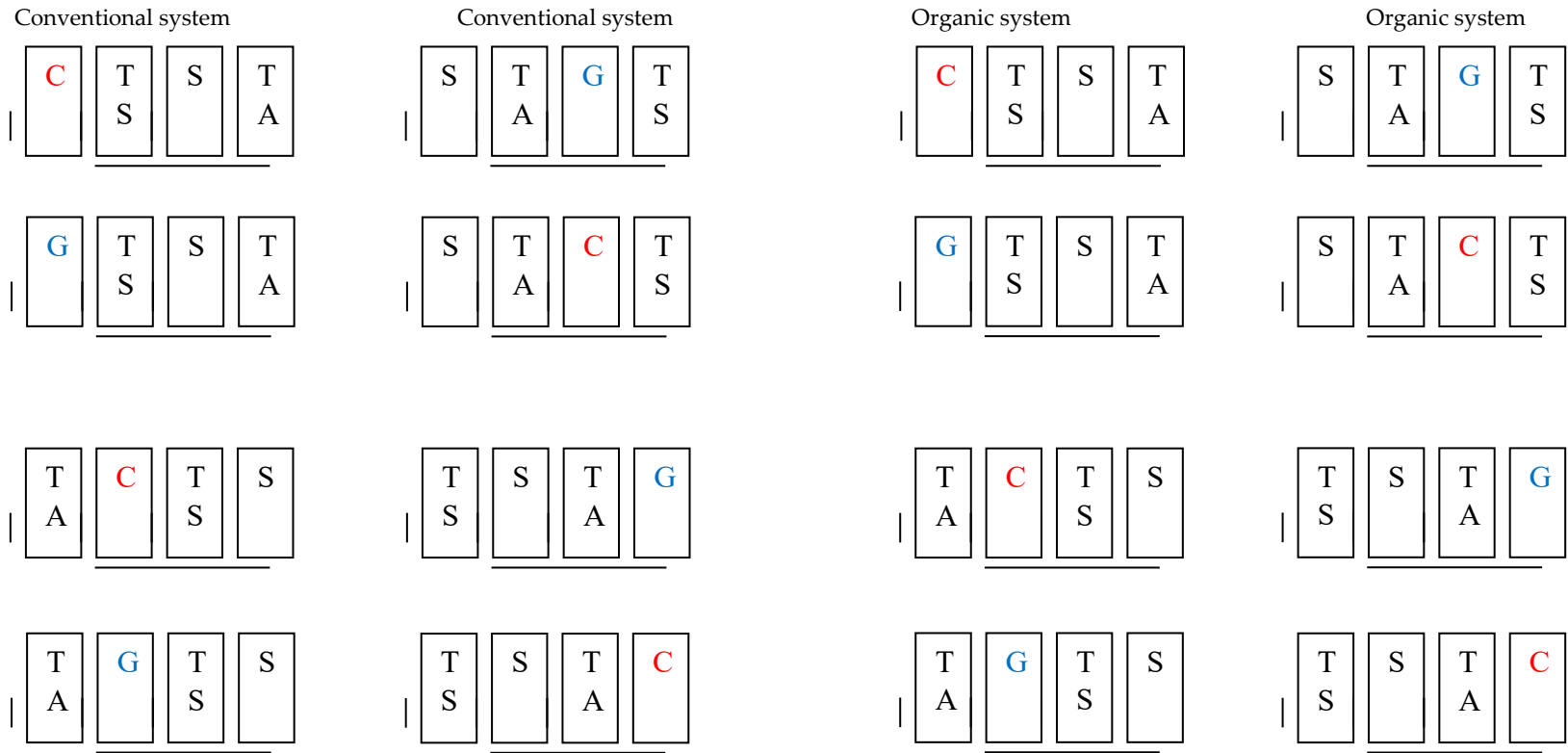


Figure S1. The spatial arrangement of replication with genotypes and management systems.

Abbreviations: C—oat cv. Celer + vetch cv. Hanka; G—oat cv. Grajcar + vetch cv. Hanka; TS—*Triticum Spelta*; S—*Solanum tuberosum*; TA—*Triticum Aestivum*.

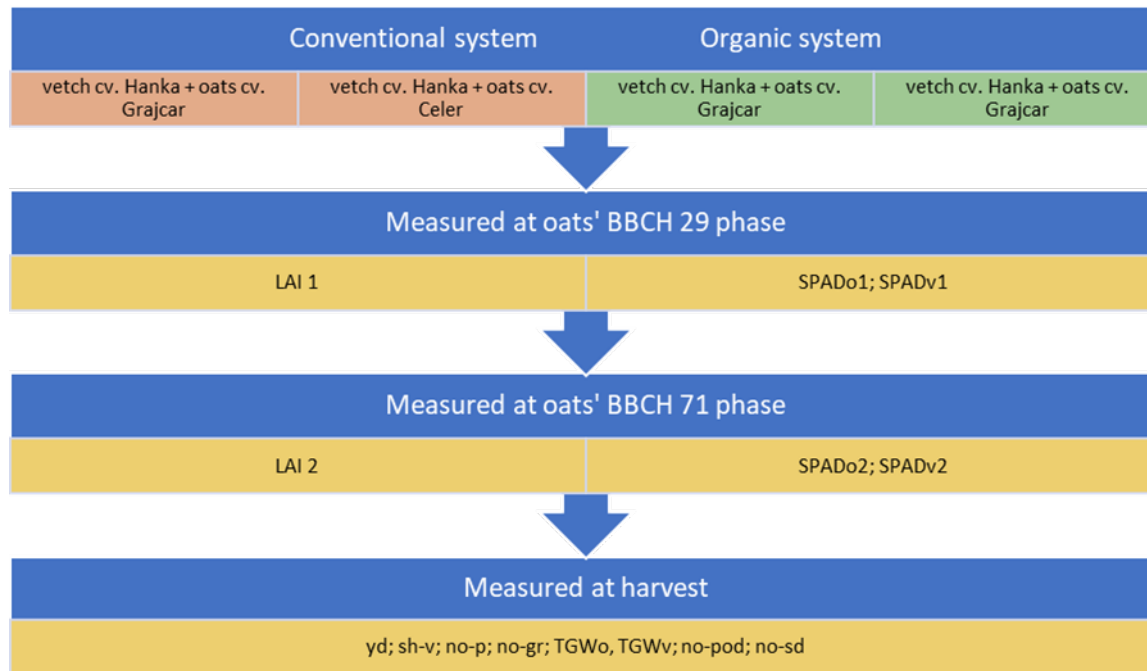


Figure S2. Flowchart of methodology of the research.

Abbreviations: LAI₁—leaf area index in the oats' tillering phase BBCH 29; SPAD_{o1}—relative chlorophyll content in the oats' tillering phase BBCH 29; SPAD_{v1}—relative chlorophyll content in vetches' leaves in the oats' tillering phase BBCH 29; LAI₂—leaf area index in the oats BBCH 71 phase; SPAD_{o2}—relative chlorophyll content in oats' leaves in the oats BBCH 71 phase; SPAD_{v2}—relative chlorophyll content in vetches' leaves in the oats BBCH 71 phase; yd—mixtures yield; sh-v—share of vetch in the mixture's yield; no-p—number of oats panicles per m²; no-g—number of oats grains per panicle; TGW_o—thousand grain mass of oats; TGW_v—thousand grain mass of vetch; no-pod—number of vetch pods per m²; no-sd—number of vetch seeds per pod.