

Table S1. Mean values over three years of content of the various minerals, yield and grain protein content for the genotypes grown at each location. Genotypes grown in all four localities are marked with bold text.

Source	Zn (10 ¹)	S (10 ³)	P (10 ³)	Na (10 ¹)	Mn (10 ¹)	Mg (10 ³)	K (10 ³)	Fe (10 ¹)	Cu	Ca (10 ²)	Yield (kg ha ⁻¹)	Protein (%)
<i>Ekhaga</i>												
Algot	4.10	1.56	4.26	3.15	3.30	1.32	3.82	4.27	8.17	6.01	3190	12.4
Balder	3.67	1.45	3.95	3.00	1.10	1.17	4.00	3.55	5.19	3.05	3200	11.3
Bambu	4.55	2.16	5.70	1.50	5.68	1.54	3.85	6.49	6.02	6.58	2630	12.8
Dacke	4.10	1.55	4.21	2.00	3.62	1.31	3.60	3.82	5.26	3.96	3370	13.5
Diamant brun	5.65	1.71	4.29	2.53	4.17	1.31	3.43	5.35	6.62	5.35	2780	13.6
Domen	4.12	1.52	4.02	3.00	0.97	1.14	3.97	4.53	7.16	3.99	2680	11.5
Ella	4.73	1.55	4.10	3.27	3.58	1.30	3.59	4.64	6.84	5.00	3440	12.0
Emmer Gotland	5.62	1.82	4.86	1.77	3.80	1.49	4.00	4.82	7.28	3.71	2500	13.2
Engelbrekt	3.98	2.01	5.49	4.45	4.72	1.47	3.62	5.24	6.13	5.97	3460	12.2
Hulless 6row barley	4.67	1.56	4.38	5.42	1.73	1.33	4.21	5.18	5.53	5.58	2220	12.5
Hulless 2row barley	4.70	1.71	5.14	5.55	1.72	1.42	4.63	5.08	6.61	5.80	2520	14.7
Hulless oats	4.10	2.01	5.07	1.75	5.13	1.45	3.40	5.21	5.69	7.90	2280	15.2
Ingrid	3.42	1.47	3.66	2.95	0.95	1.13	3.56	2.98	5.59	3.18	3160	11.0
Jusso	4.95	1.60	4.03	2.30	2.90	1.08	4.26	5.35	6.24	4.82	1810	11.9
Kajsa	4.40	1.51	4.37	3.62	1.20	1.18	3.73	4.09	6.14	4.06	2430	12.8
Kärn	4.00	1.52	4.30	4.38	3.70	1.24	3.82	4.19	5.78	4.86	3690	12.0
Landrace Dalarna	3.80	1.50	4.19	2.23	3.53	1.21	4.12	3.70	5.37	4.33	3750	12.6
Landrace Halland	3.78	1.52	4.51	2.43	3.42	1.27	4.15	3.93	5.29	4.93	3680	12.3
Orion	4.68	2.27	5.94	1.87	5.05	1.61	4.01	6.38	6.90	6.59	2060	12.7
Prins	4.18	1.58	3.95	2.80	3.05	1.26	3.71	4.69	5.70	3.97	3240	12.6
Sisu	4.05	2.03	5.21	1.73	4.30	1.49	4.02	5.06	5.62	6.71	3420	11.5
Sol	3.98	2.17	5.38	1.65	4.65	1.38	4.12	5.22	5.78	6.68	3450	11.9
Spelt wheat Gotland	4.83	1.81	4.97	1.85	3.93	1.50	3.71	4.75	7.60	2.92	3150	14.9
Virma	4.18	2.21	5.38	2.63	5.25	1.50	4.06	5.73	6.46	6.76	3640	12.2
Öland	5.20	1.76	5.06	2.27	3.77	1.49	3.74	5.71	6.50	5.37	3090	13.2
<i>Krusenberg</i>												
Algot	4.10	1.52	396	0.97	4.07	1.19	3.82	4.35	5.41	5.50	2620	11.7
Aurore	3.47	1.42	3.91	1.27	3.92	1.15	3.87	3.83	4.77	4.89	2250	12.1
Balder	2.92	1.33	3.60	2.80	1.32	1.07	3.42	3.33	4.01	2.92	2870	10.5
Dacke	3.95	1.50	3.83	1.30	3.73	1.17	3.83	3.87	4.87	4.75	2270	11.8
Diamant brun	4.05	1.43	4.09	1.43	4.68	1.12	3.81	4.59	5.18	5.66	2140	11.3
Ella	3.62	1.45	4.05	1.55	4.40	1.20	3.81	4.34	4.79	4.86	2470	11.1
Emmer Gotland	4.77	1.60	4.66	1.95	4.57	1.36	4.18	4.39	5.92	3.51	1880	12.3
Engelbrekt	4.37	1.93	5.29	2.28	5.25	1.48	3.63	5.40	5.41	5.53	2050	11.8
Extra klock	4.32	2–03	5.56	1.38	5.43	1.54	4.06	5.15	4.75	5.36	1860	11.2
Hulless 6row barley	3.62	1.52	4.29	3.18	2.32	1.26	4.05	3.55	4.62	4.70	2510	11.5
Hulless 2row barley	3.23	1.59	4.59	3.95	2.48	1.29	4.04	3.52	4.72	4.30	2630	13.2
Hulless oats	4.15	2.12	5.40	1.70	6.00	1.60	3.98	3.93	4.00	9.20	1080	12.5
Ingrid	2.30	1.36	3.35	2.05	0.92	1.04	3.17	2.71	3.66	2.99	3350	10.8
Jusso	4.03	1.37	3.98	1.00	3.90	1.15	4.21	4.11	4.72	4.02	2410	10.7
Kajsa	3.17	1.34	4.18	2.88	1.65	1.14	3.46	3.41	5.02	3.35	2670	11.9
Kärn	3.57	1.43	3.95	1.27	4.20	1.16	3.83	3.98	4.33	4.94	2760	11.1
Landrace Dalarna	3.73	1.36	3.89	1.72	4.75	1.14	3.95	3.89	4.41	4.45	2570	11.1
Landrace Halland	3.75	1.43	3.94	2.32	4.80	1.15	3.96	4.28	5.04	4.56	2390	11.1
Orion	4.77	2.13	5.78	1.33	5.67	1.63	3.92	5.39	5.81	5.96	1240	12.9
Seger	4.97	2.24	5.69	1.12	5.93	1.65	4.16	5.30	5.61	6.07	2020	11.1
Sol	4.35	2.08	5.43	1.23	5.45	1.57	4.18	5.01	5.31	5.95	2150	10.5

Spelt wheat Gotland	4.43	1.83	4.89	1.28	5.05	1.48	3.84	4.84	5.48	3.94	2250	12.6
Svanhals	2.88	1.44	4.02	2.27	1.32	1.22	3.17	3.19	4.35	3.12	2680	12.5
Virma	4.37	1.86	4.93	1.07	6.05	1.39	3.84	4.63	4.80	5.39	1540	10.8
Öland	3.97	1.50	4.25	1.02	4.70	1.22	3.71	4.76	4.74	5.27	2690	12.3
<i>Gotland</i>												
Argus	3.55	2.10	5.91	1.85	2.73	1.55	3.97	4.27	4.73	6.62	2820	10.2
Atle	4.10	1.60	4.41	4.48	1.25	1.38	4.04	3.73	5.12	5.85	2390	13.4
Blenda	3.67	2.13	5.45	2.07	1.97	1.48	3.86	4.36	4.36	7.30	3980	11.5
Diamant brun	4.87	1.66	4.57	2.00	1.38	1.38	3.44	3.93	4.93	5.87	2650	13.3
Dragon	4.00	1.72	4.67	1.85	1.37	1.48	4.07	3.20	6.03	4.30	3340	13.3
Ella	4.47	1.57	4.52	1.87	0.95	1.40	3.59	3.81	5.33	5.25	3010	13.1
Emmer Gotland	5.15	1.57	5.76	2.55	1.57	1.68	4.47	4.15	6.04	4.41	3270	14.0
Engelbrekt	3.77	2.03	5.56	1.48	1.68	1.52	3.73	4.45	5.13	6.73	3650	11.0
Gotlandskorn	2.95	1.25	3.78	3.62	0.52	1.06	3.41	3.67	4.37	3.46	4560	10.9
Gullkorn	3.70	1.46	4.48	4.07	0.52	1.20	3.66	3.79	5.29	3.97	2960	13.5
Hulless 6row barley	3.78	1.54	4.77	8.37	0.85	1.30	4.32	4.20	4.80	5.78	2850	12.8
Hulless 2row barley	3.98	1.67	5.11	7.93	1.22	1.37	4.18	4.81	5.62	6.06	3160	15.0
Hulless oats	3.33	1.85	5.12	1.88	2.60	1.44	3.85	4.02	4.56	7.55	2630	13.8
Ingrid	2.63	1.31	4.10	3.90	0.60	1.10	3.63	3.88	4.54	3.24	4650	11.1
Jusso	4.52	1.70	4.68	2.77	1.45	1.28	4.62	4.30	5.82	5.57	1890	12.9
Landrace Dalarna	4.75	1.73	4.59	3.22	1.47	1.43	3.79	4.31	5.70	6.26	2710	13.8
Orion	4.25	2.21	5.57	2.23	2.25	1.53	3.88	5.41	5.59	7.15	2030	12.1
Prins	4.05	1.62	4.38	2.20	0.98	1.41	3.83	3.79	5.00	4.71	3170	14.0
Rika	3.38	1.31	3.99	4.23	0.42	1.11	3.54	3.90	5.53	3.31	4360	11.3
Spelt wheat Gotland	4.68	1.91	5.37	2.45	1.78	1.60	3.94	4.03	6.85	3.27	3090	14.0
Spelt wheat Gotland d	5.02	1.97	5.20	2.43	1.45	1.59	3.79	3.49	7.36	3.81	3410	13.7
Summer oats	3.83	2.22	6.00	2.58	1.80	1.64	3.71	5.14	6.18	7.45	3370	7.8
Ur gotland	4.02	2.36	6.03	3.83	1.60	1.73	4.12	5.21	6.02	7.97	2210	10.6
Virma	3.82	2.13	5.26	1.83	1.92	1.46	3.90	4.22	4.91	7.40	3330	11.7
Öland	4.13	1.66	4.57	1.35	1.40	1.43	3.57	4.44	4.95	4.77	2560	14.7
<i>Alnarp</i>												
Algot	3.05	1.28	4.11	2.72	2.33	1.24	4.03	3.33	4.04	4.58	3740	11.0
Alva	2.58	1.23	4.25	4.82	0.92	1.14	4.04	3.90	4.06	3.72	4060	9.3
Atle	3.02	1.33	4.09	2.07	2.27	1.22	4.04	3.28	3.94	4.82	3500	10.8
Atson	2.88	1.44	4.41	1.80	1.83	1.31	4.10	3.95	4.57	4.23	3560	11.1
Diamant brun	3.82	1.49	4.48	1.68	3.42	1.32	3.70	4.72	4.53	5.41	2790	11.6
Dragon	2.60	1.26	4.05	2.03	2.20	1.23	4.08	3.29	3.76	4.44	4130	10.6
Ella	3.23	1.41	4.41	1.75	3.10	1.30	3.79	3.54	4.85	4.71	3670	11.4
Emmer Gotland	3.75	1.44	4.70	28.5	2.43	1.30	3.93	4.16	5.28	4.41	2850	11.9
Engelbrekt	3.68	1.81	5.29	2.68	3.08	1.38	3.67	4.35	3.71	6.37	3710	10.6
Gotlandskorn	2.35	1.15	4.05	4.30	2.18	1.09	4.09	3.50	3.95	3.83	4470	9.5
Hulless 6row barley	3.08	1.51	4.84	5.78	1.32	1.31	4.29	4.36	4.49	5.87	2370	11.8
Hulless 2row barley	3.07	1.45	5.13	5.73	1.42	1.35	4.40	4.67	5.09	5.79	2380	13.1
Hulless oats	2.65	1.53	4.45	3.08	2.93	1.20	3.59	3.86	3.46	7.72	2850	10.8
Ingrid	2.42	1.19	3.82	4.37	0.65	1.04	3.77	3.03	4.05	3.47	4540	9.4
Jusso	3.17	1.32	4.18	1.93	1.33	1.09	4.64	3.54	4.73	4.34	3210	10.0
Klock	3.58	1.88	5.29	2.57	3.37	1.40	3.62	4.04	3.94	6.13	2920	11.6
Lina	2.43	1.13	4.12	4.32	0.82	1.09	4.14	3.25	4.06	4.92	4090	9.5
Osmo	34.8	2.00	5.47	2.47	3.40	1.46	3.66	4.91	3.97	6.88	2830	13.3
Palu	3.85	1.83	5.11	2.28	2.68	1.36	3.87	3.94	3.95	6.91	3600	10.7
Seger	3.85	1.81	5.26	2.75	3.58	1.46	3.66	4.91	3.74	6.22	3160	10.7
Selma	3.40	1.64	4.81	3.42	2.72	1.29	3.55	4.18	3.45	7.23	3890	10.5
Spelt wheat Gotland	3.60	1.58	4.96	2.78	2.45	1.39	3.78	4.47	5.80	3.00	3080	12.7
Walter	2.75	1.37	4.07	1.93	1.77	1.23	3.79	3.78	3.85	4.03	3740	11.4
Virma	3.23	1.80	4.90	2.00	3.12	1.31	3.75	3.61	3.71	6.94	3820	10.4
Öland	3.32	1.52	4.81	1.45	2.20	1.46	3.75	4.61	4.78	5.20	3460	12.0

Table S2. Pearson correlation coefficients between evaluated minerals.

Source	Zn	S	P	Na	Mn	Mg	K	Fe	Cu
S	0.51 ***								
P	0.34 ***	0.69 ***							
Na	0.09	-0.11	0.01						
Mn	0.25 ***	0.33 ***	0.26 ***	-0.40 ***					
Mg	0.49 ***	0.71 ***	0.89 ***	-0.02	0.25 ***				
K	0.09	-0.03	0.22 ***	0.13 *	0.10	0.14 *			
Fe	0.52 ***	0.60 ***	0.43 ***	0.03	0.37 ***	0.45 ***	-0.03		
Cu	0.63 ***	0.44 ***	0.19 ***	0.15 *	0.02	0.34 ***	-0.17 ***	0.54 ***	
Ca	0.30 ***	0.59 ***	0.55 ***	0.15 **	0.25 ***	0.50 ***	0.23 ***	0.36 ***	0.07

*, **, *** = Significant at $p < 0.05$, 0.01 and 0.005.

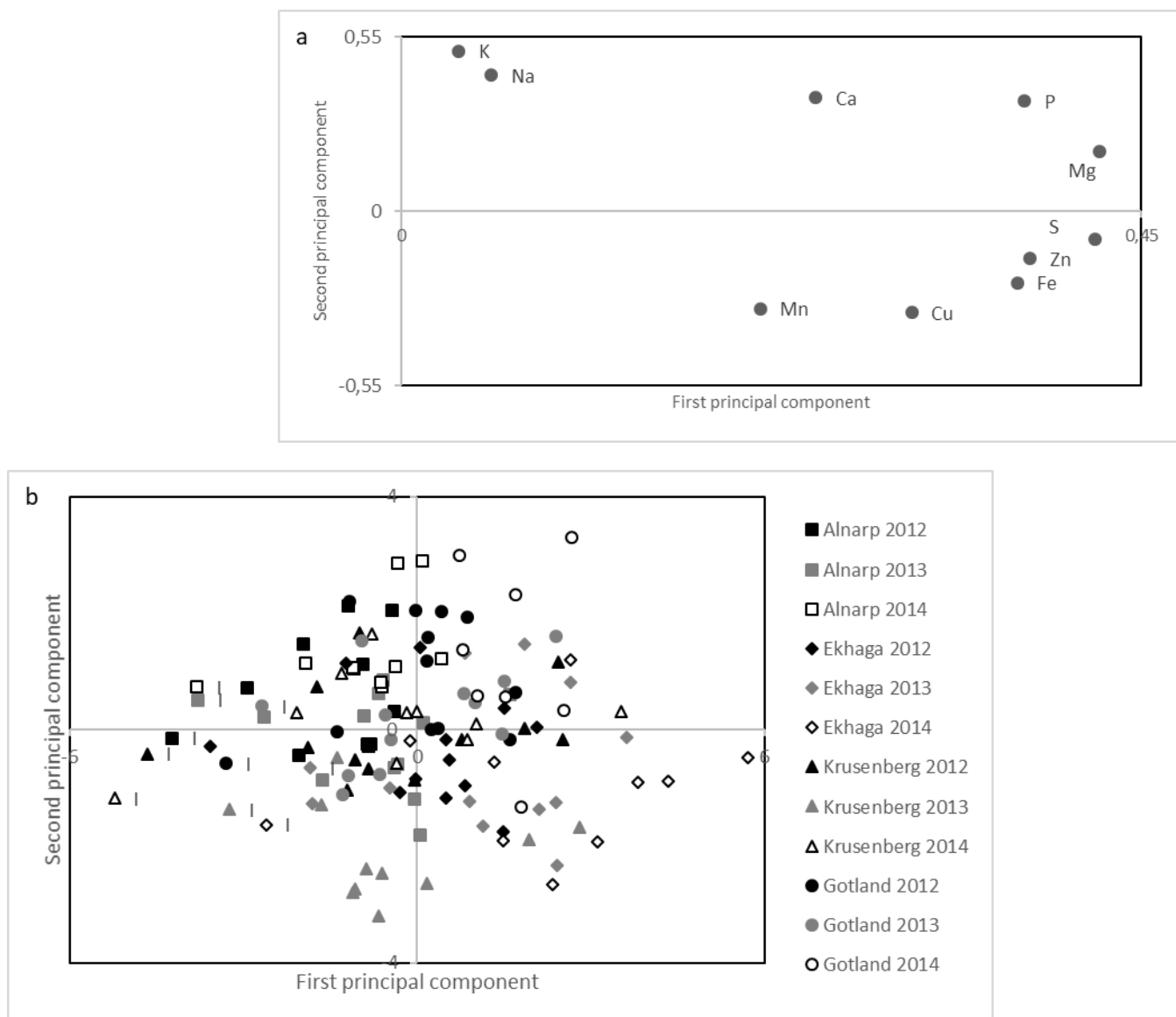


Figure S1. Score (a) and loading (b) plot from principal component analysis of mineral content in organically grown and locally adapted spring cereals grown at different localities during different years. I indicates the spring barley cultivar Ingrid. First principal component explained 35.0% of the variation and the second principal component explained 17.2% of the variation.