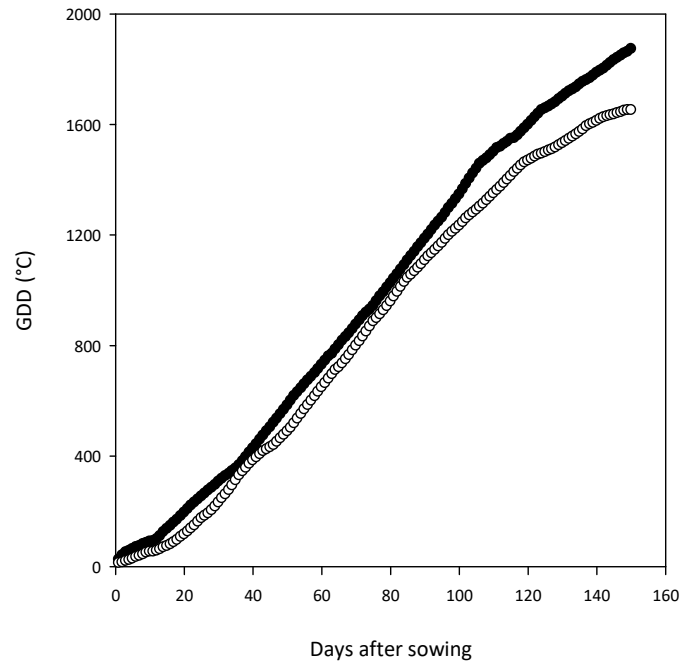


Table S1. Physico-chemical characteristics of the soil in the paddy field where rice plants were grown.

Characteristic	Value
<i>Physical</i>	
Sand, %	47.8 ± 1.8
Clay, %	9.4 ± 0.7
Silt, %	42.8 ± 2.1
<i>Chemical</i>	
pH _{H₂O}	6.4 ± 0.1
TKN, g kg ⁻¹	0.79 ± 0.11
TOC, g kg ⁻¹	8.38 ± 0.42
Organic matter, g kg ⁻¹	14.5 ± 0.1
CEC, cmol kg ⁻¹	10.8 ± 0.5
C/N ratio	18.9 ± 0.4
P Olsen, mg kg ⁻¹	23.6 ± 0.6
K, g kg ⁻¹	2.35 ± 0.13
Ca, g kg ⁻¹	9.5 ± 0.4
Mg, g kg ⁻¹	9.78 ± 0.52
Mn, g kg ⁻¹	0.28 ± 0.01
Fe, g kg ⁻¹	20.9 ± 1.2
Zn, mg kg ⁻¹	45.5 ± 1.5
Cu, mg kg ⁻¹	23.7 ± 1.7
Ni, mg kg ⁻¹	72.6 ± 4.6
Cd, mg kg ⁻¹	0.14 ± 0.02
As, mg kg ⁻¹	2.6 ± 0.3

TKN = Total Kjeldhal N; TOC = Total Organic Carbon; CEC = Cation Exchange Capability. Data are the means ± SE of measurements on six different samples. For methods, see Colombo, C., and Miano, T., editors. 2015. Metodi di analisi chimica del suolo. 3rd ed. Società Italiana della Scienza del Suolo - Associazione italiana dei Laboratori Pubblici di Agrochimica. Modugno (BA), Italy.

Figure S1. Growing degree days (GDD) for the three rice cultivars during the two growing seasons 2012 (filled circles) and 2013 (open circles).



GDD values were calculated by the following equation: $GDD = \sum_{days} [(T_{max} - T_{min})/2] - T_b$. T_{max} = daily maximum temperature; T_{min} = daily minimum temperature; T_b = 10 °C (rice base temperature).

Table S2. Significance of variance estimates related to rice cultivar (cv.), year (Y), water regime (WR), and their interactions on plant phenology, yield, grain morphology, and whole grain quality traits.

Trait	cv.	Y	WR	cv. × Y	cv. × WR	Y × WR	cv. × Y × WR
Flowering time, d	***	***	***	***	**	***	NS
Flowering-maturing time, d	***	***	*	NS	NS	NS	NS
Linear yield, g m ⁻¹	***	***	***	**	**	NS	*
Fertile tillers m ⁻¹ , n	**	***	NS	NS	NS	**	NS
Seed panicle ⁻¹ , n	***	***	***	NS	***	*	NS
Weight 100, g	***	NS	***	**	***	*	NS
Grain length, mm	***	NS	***	NS	*	NS	NS
Grain width, mm	***	NS	NS	NS	**	NS	NS
CHL index	NS	*	*	NS	NS	NS	*
NBI index	NS	NS	*	NS	NS	NS	**
Apparent amylose content, %	***	*	NS	NS	NS	*	***
N-protein content, %	**	*	*	NS	*	**	***
Total flavonoids, g RE kg ⁻¹	***	NS	***	NS	NS	NS	NS
Total tocols, mg kg ⁻¹	***	***	***	**	***	NS	*
γ-oryzanol, mg kg ⁻¹	***	NS	***	*	**	NS	NS
Phytic acid, g kg ⁻¹	NS	*	NS	*	NS	NS	NS
Antioxidant activity, mmol TEAC kg ⁻¹	***	NS	***	NS	***	NS	NS
αT3, mg kg ⁻¹	***	NS	***	***	***	***	***
γT3, mg kg ⁻¹	***	NS	***	***	***	*	NS
δT3, mg kg ⁻¹	***	***	***	NS	***	**	***
αT, mg kg ⁻¹	*	***	*	*	**	NS	NS
γT, mg kg ⁻¹	***	***	***	***	***	***	***
δT, mg kg ⁻¹	***	***	***	*	***	***	†
CAF, mg kg ⁻¹	*	NS	NS	**	*	NS	NS
24Me-CAF, mg kg ⁻¹	***	NS	***	NS	***	NS	NS
CSF, mg kg ⁻¹	***	***	***	***	*	NS	NS
K, g kg ⁻¹	**	**	***	***	***	***	**
P, g kg ⁻¹	***	*	**	**	***	NS	**
Ca, mg kg ⁻¹	***	**	***	***	**	NS	NS

Cu, mg kg ⁻¹	***	*	***	NS	NS	NS	NS
Fe, mg kg ⁻¹	***	***	NS	*	NS	NS	*
Mg, g kg ⁻¹	***	NS	NS	***	**	*	**
Mn, mg kg ⁻¹	***	NS	***	***	NS	NS	***
Ni, mg kg ⁻¹	***	*	***	NS	***	***	NS
Zn, mg kg ⁻¹	NS	***	***	*	NS	***	NS
As, µg kg ⁻¹	NS	***	***	NS	NS	NS	NS
Cd, µg kg ⁻¹	***	***	***	***	***	***	***

CHL, chlorophyll index; NBI, nitrogen balance index; RE, rutin equivalents; TEAC, Trolox equivalent antioxidant capacity; α T3, γ T3, δ T3: α -, γ -, δ -tocotrienols; α T, γ T, δ T: α -, γ -, δ -tocopherol; CAF, *cycloartenyl ferulate*; 24Me-CAF, 24-methyl*cycloartenyl ferulate*; CSF, *campesteryl ferulate*. Data were subjected to multiway ANOVA analysis (variables: cultivar, year, water regime). The homogeneity of the variances was checked with Levene's test. Significance at: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. NS, not significant at $p = 0.05$. †Not calculable because of the presence of a few not detectable data (see Table 4).

Table S3. Variability indexes of the results concerning plant phenology and yield-related traits and grain morphology of three rice cultivars grown under continuous flooding (CF) or alternate wetting and drying (AWD).

Trait	Years	cv. 'Baldo'		cv. 'Gladio'		cv. 'Loto'	
		CF	AWD	CF	AWD	CF	AWD
Flowering time (DF), d	2012	90-93; ± 1.7	90-94; ± 2.3	78-87; ± 4.5	88-89; ± 0.6	86-88; ± 1.0	85-89; ± 2.0
	2013	95-96; ± 0.6	104-105; ± 0.6	92-95; ± 1.5	108-112; ± 2.1	83-86; ± 1.5	94-98; ± 2.3
Flowering-maturing time (DFM), d	2012	55-57; ± 1.2	49-57; ± 4.6	43-47; ± 2.1	41-42; ± 0.6	43-57; ± 7.0	45-51; ± 3.2
	2013	59-60; ± 0.6	55-63; ± 4.2	54-60; ± 3.1	39-56; ± 8.6	56-71; ± 7.7	59-67; ± 4.0
Linear yield, g m ⁻¹	2012	293.6-333.6; ± 22.7	237.6-273.0; ± 17.9	194.0-212.5; ± 10.1	158.8-169.3; ± 5.6	205.7-237.3; ± 15.8	176.0-202.0; ± 13.6
	2013	313.3-341.8; ± 14.3	263.3-283.0; ± 10.9	227.2-260.6; ± 17.6	156.4-180.4; ± 12.2	243.0-280.2; ± 18.6	247.0-283.8; ± 18.5
Fertile tillers m ⁻¹ , n	2012	58-74; ± 8.0	42-68; ± 13.6	64-90; ± 14.5	68-80; ± 6.0	72-112; ± 20.0	62-72; ± 5.0
	2013	58-72; ± 7.0	68-100; ± 16.0	68-120; ± 26.1	92-146; ± 27.0	76-96; ± 10.0	100-126; ± 13.1
Seeds panicle ⁻¹ , n	2012	108-119; ± 5.57	97-104; ± 3.51	103-110; ± 3.61	82-87; ± 2.52	87-95; ± 4.62	77-96; ± 9.71
	2013	112-120; ± 4.16	93-96; ± 1.53	99-107; ± 4.04	61-72; ± 5.69	83-89; ± 3.06	73-81; ± 4.36
Weight of 100 grains, g	2012	3.68-3.75; ± 0.04	3.19-3.22; ± 0.02	2.11-2.14; ± 0.02	1.90-1.91; ± 0.06	2.59-2.69; ± 0.06	2.43-2.49; ± 0.03
	2013	3.58-3.72; ± 0.07	2.90-3.16; ± 0.14	2.04-2.15; ± 0.60	1.59-1.80; ± 0.11	2.68-2.90; ± 0.12	2.35-2.68; ± 0.17
Grain length, mm	2012	7.08-7.38; ± 0.16	6.99-7.26; ± 0.15	7.32-7.68; ± 0.20	6.25-7.09; ± 0.46	6.39-6.68; ± 0.15	6.22-6.51; ± 0.16
	2013	7.52-7.57; ± 0.03	6.79-7.00; ± 0.11	7.42-7.49; ± 0.04	6.76-6.86; ± 0.05	6.56-6.62; ± 0.03	6.18-6.32; ± 0.07
Grain width, mm	2012	3.19-3.39; ± 0.10	3.10-3.31; ± 0.11	2.10-2.25; ± 0.08	2.11-2.96; ± 0.44	2.98-3.03; ± 0.03	2.67-2.85; ± 0.09
	2013	3.21-3.26; ± 0.03	2.93-3.07; ± 0.07	2.08-2.15; ± 0.04	2.10-2.29; ± 0.10	2.96-3.03; ± 0.04	2.87-2.91; ± 0.02

For each parameter, the minimum and the maximum values among the three plots are reported $\pm$ SD of the average values among the plots reported in Table 1.

Table S4. Variability indexes of the data concerning chlorophyll (CHL) and nitrogen balance (NBI) indexes in the flag leaf, apparent amylose and N-protein contents in whole grains of three rice cultivars grown under continuous flooding (CF) or alternate wetting and drying (AWD).

Trait	Years	cv. 'Baldo'		cv. 'Gladio'		cv. 'Loto'	
		CF	AWD	CF	AWD	CF	AWD
CHL	2012	29.94-42.85; ± 6.46	17.43-31.63; ± 7.52	27.59-32.03; ± 2.55	26.50-28.98; ± 1.28	26.86-34.68; ± 4.00	29.59-37.24; ± 3.88
	2013	24.27-38.10; ± 6.96	28.60-33.05; ± 2.29	40.22-41.66; ± 0.78	25.71-39.12; ± 6.92	34.22-40.22; ± 3.32	30.45-34.80; ± 2.40
NBI	2012	21.52-35.10; ± 6.88	12.99-22.29; ± 5.07	18.87-24.72; ± 3.29	18.00-24.65; ± 3.79	20.79-24.30; ± 1.96	19.83-27.82; ± 4.04
	2013	14.26-22.13; ± 4.01	18.23-21.49; ± 1.80	25.58-26.30; ± 0.40	15.49-23.20; ± 3.90	24.24-28.66; ± 2.40	18.95-24.49; ± 2.87
Apparent amylose content, %	2012	18.17-18.80; ± 0.34	16.62-17.17; ± 0.28	22.77-25.55; ± 1.44	21.19-21.36; ± 0.09	14.05-14.53; ± 0.27	15.98-16.46; ± 0.26
	2013	16.53-18.80; ± 1.16	17.95-19.93; ± 1.01	20.86-24.76; ± 1.96	25.74-25.94; ± 0.10	14.89-18.92; ± 2.01	14.28-15.08; ± 0.43
N protein content, %	2012	6.16-8.16; ± 1.00	6.62-7.05; ± 0.22	6.45-6.92; ± 0.24	6.66-7.51; ± 0.42	7.62-8.17; ± 0.28	7.16-7.58; ± 0.22
	2013	6.00-6.25; ± 0.13	7.92-8.66; ± 0.38	7.41-7.77; ± 0.18	7.00-7.60; ± 0.29	7.36-7.74; ± 0.20	7.53-9.16; ± 0.84

For each parameter, the minimum and the maximum values among the three plots are reported $\pm$ SD of the average value among the plots reported in Table 2.

Table S5. Variability indexes of the results concerning the total concentration of health promoting compounds and antioxidant activity in whole grains of three rice cultivars grown under continuous flooding (CF) or alternate wetting and drying (AWD).

Trait§	Years	cv. 'Baldo'		cv. 'Gladio'		cv. 'Loto'	
		CF	AWD	CF	AWD	CF	AWD
Total flavonoids, g RE kg ⁻¹	2012	1.24-1.42; ±0.09	1.97-2.18; ±0.11	1.88-2.14; ±0.13	2.39-2.61; ±0.12	1.62-1.72; ±0.05	2.05-2.13; ±0.04
	2013	1.37-1.54; ±0.09	1.85-2.05; ±0.11	1.76-1.93; ±0.09	2.26-2.52; ±0.13	1.67-1.84; ±0.09	2.35-2.52; ±0.10
Total tocols, mg kg ⁻¹	2012	11.93-16.35; ±2.22	29.00-38.54; ±4.77	13.83-17.10; ±1.64	11.83-16.73; ±2.45	7.63-14.39; ±3.39	25.88-29.00; ±1.56
	2013	13.50-20.90; ±3.71	24.97-32.33; ±3.68	14.54-22.90; ±4.18	14.90-24.00; ±4.55	15.90-18.62; ±1.37	22.00-48.34; ±14.44
γ-oryzanol, mg kg ⁻¹	2012	45.40-62.10; ±8.37	51.95-63.15; ±5.68	38.70-50.12; ±5.72	55.00-60.70; ±2.89	44.05-57.20; ±6.68	87.50-97.10; ±5.30
	2013	49.02-70.30; ±10.73	66.10-91.50; ±12.71	28.10-57.67; ±14.85	16.20-54.40; ±19.26	51.21-69.80; ±9.30	83.15-110.4; ±15.12
Phytic acid, g kg ⁻¹	2012	9.83-10.15; ±0.18	9.82-11.00; ±0.61	10.53-11.20; ±0.34	9.92-12.74; ±1.41	10.49-11.02; ±0.28	9.37-11.18; ±0.91
	2013	9.10-11.91; ±1.41	10.12-11.80; ±0.85	7.23-10.09; ±1.43	8.05-10.95; ±1.59	9.07-10.53; ±0.75	9.34-11.40; ±1.04
Antioxidant activity, mmol TEAC kg ⁻¹	2012	5.16-5.30; ±0.07	5.29-5.50; ±0.11	5.78-6.85; ±0.55	5.60-6.75; ±0.58	3.85-4.00; ±0.08	4.75-4.91; ±0.09
	2013	4.53-5.25; ±0.36	5.18-5.52; ±0.17	5.86-6.74; ±0.44	5.61-6.20; ±0.30	3.27-3.49; ±0.11	4.65-4.82; ±0.09

RE, rutin equivalents; TEAC, Trolox equivalent antioxidant capacity. For each parameter, the minimum and the maximum values among the three plots are reported ± SD of the average values among the plots reported in Table 3.

Table S6. Variability indexes of the results concerning the concentrations of the single tocochromanols in whole grains of three rice cultivars grown under continuous flooding (CF) or alternate wetting and drying (AWD).

Tocochromanol	Years	cv. 'Baldo'		cv. 'Gladio'		cv. 'Loto'	
		CF	AWD	CF	AWD	CF	AWD
α T3, mg kg ⁻¹	2012	0.56-0.80; $\pm$ 0.12	0.66-2.11; $\pm$ 0.73	0.22-0.48; $\pm$ 0.13	0.51-0.59; $\pm$ 0.04	3.44-4.43; $\pm$ 0.50	0.92-4.29; $\pm$ 1.79
	2013	0.44-0.55; $\pm$ 0.06	5.64-6.27; $\pm$ 0.32	0.41-0.66; $\pm$ 0.13	0.62-0.73; $\pm$ 0.05	0.35-0.67; $\pm$ 0.18	3.18-3.51; $\pm$ 0.18
γ T3, mg kg ⁻¹	2012	9.84-13.10; $\pm$ 1.77	20.06-27.01; $\pm$ 3.48	8.14-12.96; $\pm$ 2.46	8.00-11.99; $\pm$ 2.02	6.06-8.37; $\pm$ 1.33	23.70-26.61; $\pm$ 1.64
	2013	9.37-12.35; $\pm$ 1.58	15.14-17.49; $\pm$ 1.26	11.40-15.18; $\pm$ 1.90	12.16-16.33; $\pm$ 2.15	10.65-15.29; $\pm$ 2.34	27.10-28.80; $\pm$ 0.89
δ T3, mg kg ⁻¹	2012	0.50-0.57; $\pm$ 0.04	1.63-1.74; $\pm$ 0.06	0.17-0.43; $\pm$ 0.14	1.07-1.18; $\pm$ 0.06	0.71-1.08; $\pm$ 0.18	2.23-3.33; $\pm$ 0.57
	2013	1.17-2.03; $\pm$ 0.44	0.76-2.01; $\pm$ 0.63	1.20-1.56; $\pm$ 0.18	0.93-1.04; $\pm$ 0.06	1.14-1.37; $\pm$ 0.13	3.70-4.06; $\pm$ 0.18
α T, mg kg ⁻¹	2012	0.07-0.11; $\pm$ 0.02	0.02-0.07; $\pm$ 0.03	0.25-1.38; $\pm$ 0.62	0.01-1.03; $\pm$ 0.56	0.17-0.24; $\pm$ 0.04	0.09-1.71; $\pm$ 0.82
	2013	0.55-0.90; $\pm$ 0.19	1.10-2.09; $\pm$ 0.55	0.98-0.98; $\pm$ 0.00	0.70-0.79; $\pm$ 0.05	0.68-1.07; $\pm$ 0.20	2.20-2.27; $\pm$ 0.04
γ T, mg kg ⁻¹	2012	0.09-0.10; $\pm$ 0.01	2.02-2.82; $\pm$ 0.40	0.88-1.00; $\pm$ 0.07	0.86-0.91; $\pm$ 0.03	0.85-0.99; $\pm$ 0.07	3.25-3.92; $\pm$ 0.37
	2013	2.24-2.73; $\pm$ 0.25	1.14-1.25; $\pm$ 0.06	0.95-1.02; $\pm$ 0.04	0.99-1.07; $\pm$ 0.04	0.43-0.53; $\pm$ 0.06	0.67-0.98; $\pm$ 0.16
δ T, mg kg ⁻¹	2012	0.86-0.97; $\pm$ 0.06	0.26-0.28; $\pm$ 0.01	0.07-0.15; $\pm$ 0.04	0.05-0.10; $\pm$ 0.03	0.28-0.35; $\pm$ 0.04	1.26-1.59; $\pm$ 0.18
	2013	0.25-0.28; $\pm$ 0.01	2.03-2.45; $\pm$ 0.21	0.18-0.21; $\pm$ 0.02	nd	nd	nd

α T3, γ T3, δ T3: α -, γ -, δ -tocotrienols; α T, γ T, δ T: α -, γ -, δ -tocopherol. For each parameter, the minimum and the maximum values among the three plots are reported $\pm$ SD of the average values among the plots reported in Table 4. nd: Not detectable.

Table S7. Variability indexes of the results concerning the concentrations of the γ -oryzanol complex components in whole grains of three rice cultivars grown under continuous flooding (CF) or alternate wetting and drying (AWD).

Component	Year	cv. 'Baldo'		cv. 'Gladio'		cv. 'Loto'	
		CF	AWD	CF	AWD	CF	AWD
CAF, mg kg ⁻¹	2012	2.64-7.29; ± 2.56	5.24-6.31; ± 0.58	4.76-7.73; ± 1.49	2.75-5.20; ± 1.28	2.36-5.79; ± 1.72	2.57-7.16; ± 2.30
	2013	3.49-4.49; ± 0.57	3.96-8.57; ± 2.32	3.97-6.24; ± 1.17	0.37-2.44; ± 1.04	3.89-9.38; ± 2.88	6.01-11.38; ± 2.76
24Me-CAF, mg kg ⁻¹	2012	24.65-34.47; ± 5.54	28.13-43.72; ± 8.31	19.20-29.50; ± 5.50	22.48-30.98; ± 4.27	22.38-29.97; ± 4.27	52.96-70.80; ± 9.59
	2013	22.97-39.60; ± 8.77	32.35-49.54; ± 8.69	12.54-28.87; ± 8.32	10.25-18.86; ± 4.38	23.16-32.28; ± 5.20	43.70-57.01; ± 6.69
CSF, mg kg ⁻¹	2012	13.47-20.47; ± 3.59	10.51-17.88; ± 4.23	13.80-20.02; ± 3.25	13.50-18.29; ± 2.52	16.74-19.28; ± 1.31	26.26-29.71; ± 1.73
	2013	20.29-26.64; ± 3.19	30.32-38.31; ± 4.41	12.23-18.02; ± 2.90	12.08-20.88; ± 4.72	21.44-29.73; ± 4.61	37.11-42.81; ± 2.86

CAF, *cycloartenyl ferulate*; 24Me-CAF, 24-methyl*cycloartenyl ferulate*; CSF, *campesteryl ferulate*. For each parameter, the minimum and the maximum values among the three plots are reported $\pm$ SD of the average values among the plots reported in Table 5.

Table S8. Variability indexes of the results concerning whole grain ionome of three rice cultivars grown under continuous flooding (CF) or alternate wetting and drying (AWD).

Element	Year	cv. 'Baldo'		cv. 'Gladio'		cv. 'Loto'	
		CF	AWD	CF	AWD	CF	AWD
K, g kg ⁻¹	2012	2.62-2.78; ±0.09	3.01-3.08; ±0.04	2.80-2.92; ±0.06	2.65-2.82; ±0.05	3.07-3.22; ±0.08	2.84-3.05; ±0.12
	2013	2.80-2.84; ±0.03	2.56-2.82; ±0.13	3.01-3.18; ±0.08	2.64-2.73; ±0.05	2.87-2.99; ±0.06	2.68-2.78; ±0.06
P, g kg ⁻¹	2012	3.38-3.56; ±0.11	3.49-3.79; ±0.15	4.00-4.09; ±0.05	4.00-4.04; ±0.01	4.08-4.50; ±0.24	3.89-4.07; ±0.09
	2013	3.29-3.36; ±0.04	3.27-3.56; ±0.15	4.40-4.53; ±0.07	3.67-3.89; ±0.12	3.74-4.01; ±0.14	3.67-3.96; ±0.17
Ca, mg kg ⁻¹	2012	75.23-89.26; ±7.85	63.80- 68.89; ±2.56	65.73-72.59; ±3.72	71.67-77.48; ±3.81	82.35-82.9; ±0.32	71.20-86.50; ±7.76
	2013	72.99-78.07; ±2.64	64.82-66.97; ±1.08	84.25-89.04; ±2.69	80.26-81.25; ±0.55	84.40-89.97; ±2.85	76.86-81.16; ±2.18
Cu, mg kg ⁻¹	2012	2.63-2.97; ±0.17	4.77-5.05; ±0.14	2.99-3.48; ±0.28	4.47-5.57; ±0.21	3.03-3.82; ±0.43	4.46-5.22; ±0.38
	2013	2.23-2.49; ±0.14	4.10-4.53; ±0.21	3.28-3.95; ±0.37	4.46-5.04; ±0.31	2.12-3.20; ±0.55	4.25-4.69; ±0.24
Fe, mg kg ⁻¹	2012	4.73-6.68; ±0.98	6.01-6.44; ±0.21	9.01-10.85; ±0.98	7.89-11.90; ±1.57	8.63-8.83; ±0.10	7.28-7.92; ±0.35
	2013	7.18-7.94; ±0.39	7.77-8.78; ±0.51	10.00-11.81; ±1.02	8.73-9.68; ±0.48	8.83-9.29; ±0.25	9.20-11.71; ±1.28
Mg, g kg ⁻¹	2012	1.14-1.19; ±0.03	1.25-1.29; ±0.02	1.33-1.34; ±0.01	1.26-1.35; ±0.02	1.42-1.57; ±0.08	1.42-1.46; ±0.02
	2013	1.20-1.21; ±0.01	1.12-1.24; ±0.06	1.41-1.52; ±0.06	1.31-1.33; ±0.01	1.33-1.42; ±0.04	1.40-1.43; ±0.01
Mn, mg kg ⁻¹	2012	14.39-15.85; ±0.74	7.39-8.44; ±0.53	16.25-17.41; ±0.65	13.96-15.73; ±1.25	16.82-22.08; ±2.64	9.86-12.16; ±1.26
	2013	15.44-15.79; ±0.18	7.29-9.21; ±0.96	17.57-18.41; ±0.44	9.95-10.71; ±0.41	20.19-22.10; ±0.96	15.26-17.87; ±1.31
Ni, mg kg ⁻¹	2012	0.36-0.46; ±0.05	1.17-1.70; ±0.27	0.63-0.77; ±0.07	1.84-2.53; ±0.29	0.18-0.20; ±0.01	1.13-1.40; ±0.14
	2013	0.20-0.23; ±0.02	1.37-1.81; ±0.22	0.42-0.54; ±0.06	2.32-2.83; ±0.26	0.21-0.33; ±0.07	1.62-1.90; ±0.15
Zn, mg kg ⁻¹	2012	22.05-22.95; ±0.51	23.87-24.80; ±0.47	20.90-23.30; ±1.21	21.75-25.52; ±1.34	24.36-26.55; ±1.24	23.60-24.40; ±0.40
	2013	22.74-26.59; ±2.04	18.44-20.18; ±0.88	23.58-24.24; ±0.37	19.49-20.99; ±0.76	21.24-23.52; ±1.21	18.06-20.33; ±1.14
As, µg kg ⁻¹	2012	132.80-161.40; ±14.38	74.80-85.00; ±5.13	155.18-189.15; ±17.32	55.48-69.55; ±7.21	113.93-181.20; ±33.72	81.50-93.45; ±6.44
	2013	101.40-116.92; ±8.35	9.05-33.71; ±13.18	99.51-122.22; ±11.53	9.28-11.52; ±1.27	111.45-130.89; ±10.18	17.63-23.62; ±3.02
Cd, µg kg ⁻¹	2012	9.75-11.30; ±0.78	89.60-113.90; ±12.56	24.60-28.10; ±1.75	49.73-57.35; ±3.84	11.00-14.03; ±1.61	40.65-49.05; ±4.82
	2013	19.05-19.75; ±0.40	34.50-43.75; ±4.63	11.33-14.50; ±1.59	24.75-25.50; ±0.38	9.95-12.93; ±1.52	27.53-32.75; ±2.64

For each parameter, the minimum and the maximum values among the three plots are reported ± SD of the average values among the plots reported in Table 6.

Table S9. Recovery values for the ICP analysis of grain ionome contents.

Element	Certified	Measured	Recovery (%)
K, g kg ⁻¹	1.282	1.186 ± 0.029	92.5
P, g kg ⁻¹	1.530	1.354 ± 0.032	88.5
Ca, mg kg ⁻¹	118.4	108.74 ± 8.2	91.8
Cu, mg kg ⁻¹	2.35	2.31 ± 0.2	98.3
Fe, mg kg ⁻¹	7.42	7.07 ± 0.39	95.3
Mg, g kg ⁻¹	0.559	0.516 ± 0.015	92.3
Mn, mg kg ⁻¹	19.2	18 ± 0.5	93.8
Ni, mg kg ⁻¹	//	//	//
Zn, mg kg ⁻¹	19.4	16.5 ± 0.84	85.1
As, µg kg ⁻¹	284	282 ± 17	99.3
Cd, µg kg ⁻¹	22	20 ± 1	90.9

Certified material: Rice flour NIST SRM 1568b from the National Institute of Standards and Technology - NIST, Gaithersburg, MD. Ni was not present in the analysis of certified material. For each element the threshold for acceptance of calibration quality was fixed at correlation coefficient = 0.98. The measured values are the means ± SD of five measurements.