

Supplemental Tables

A)

Lines
310546 (546)
311667 (667)
310428 (428)
Treatments (24 plants per line)
0 μ M Cd + 2 μ M Zn (c0z2)
1 μ M Cd + 2 μ M Zn (c1z2)
0 μ M Cd + 10 μ M Zn (c0z10)
1 μ M Cd + 10 μ M Zn (c1z10)
Reproductive Stages (6 plants per treatments x line) and Tissues
Vegetative (Veg)- Roots, Stems, Lower leaves
Anthesis (Ant)- Roots, Stems, Lower leaves, Flagleaves, Rachis, Grains
2 Weeks After Anthesis (2WAA)- Roots, Stems, Lower leaves, Flagleaves, Peduncles, Rachis, Grain
4 Weeks After Anthesis (4WAA)- Roots, Stems, Lower leaves, Flagleaves, Peduncles, Rachis, Grain

B)

Line x (treatment) x harvest	Pot 1 (rep 1)	Pot 2 (rep 2)	Pot 3 (rep 3)
546 x (0 μ M Cd + 2 μ M Zn) x Vegetative	2 plants	2 plants	2 plants
546 x (0 μ M Cd + 2 μ M Zn) x Anthesis	2 plants	2 plants	2 plants
546 x (0 μ M Cd + 2 μ M Zn) x 2 Weeks After Anthesis	2 plants	2 plants	2 plants
546 x (0 μ M Cd + 2 μ M Zn) x 4 Weeks After Anthesis	2 plants	2 plants	2 plants
546 x (1 μ M Cd + 2 μ M Zn) x Vegetative	2 plants	2 plants	2 plants
546 x (1 μ M Cd + 2 μ M Zn) x Anthesis	2 plants	2 plants	2 plants
546 x (1 μ M Cd + 2 μ M Zn) x 2 Weeks After Anthesis	2 plants	2 plants	2 plants
546 x (1 μ M Cd + 2 μ M Zn) x 4 Weeks After Anthesis	2 plants	2 plants	2 plants
546 x (0 μ M Cd + 10 μ M Zn) x Vegetative	2 plants	2 plants	2 plants
546 x (0 μ M Cd + 10 μ M Zn) x Anthesis	2 plants	2 plants	2 plants
546 x (0 μ M Cd + 10 μ M Zn) x 2 Weeks After Anthesis	2 plants	2 plants	2 plants
546 x (0 μ M Cd + 10 μ M Zn) x 4 Weeks After Anthesis	2 plants	2 plants	2 plants
546 x (1 μ M Cd + 10 μ M Zn) x Vegetative	2 plants	2 plants	2 plants
546 x (1 μ M Cd + 10 μ M Zn) x Anthesis	2 plants	2 plants	2 plants
546 x (1 μ M Cd + 10 μ M Zn) x 2 Weeks After Anthesis	2 plants	2 plants	2 plants
546 x (1 μ M Cd + 10 μ M Zn) x 4 Weeks After Anthesis	2 plants	2 plants	2 plants

96 plants total per line

Table S1: Experimental design. A) List of Lines, Treatments, Reproductive Stages, and Tissues analyzed in experiment. A total of six plants (two plants per pot) of each line of rice was grown in each of the treatments and harvested at one of four predetermined reproductive stages. B) Upon harvests, plant materials from a single pot were separated by tissue. Plant material from a single pot was then combined to be used as an experimental replicate (n=3). Table S1B was repeated for lines 667 and 428.

Ubiquitin (99bp amplicon)	F	CCACATTACCGCCTCCATTT
	R	GATCTGCATCTTGCCACTCTC
NRAMP5 (99 bp amplicon)	F	GGCATCAGTCAGAGGAATCAA
	R	GAGACGACGGCGATGTTTAT
HMA2 (99 bp amplicon)	F	GGTTCATCGTCTTCCTCTTCAC
	R	GTGGTGCCATGCTCATTAGA
HMA3 (106 bp amplicon)	F	TGACGCATCCAACTCAATAGTC
	R	CCGTAGTTCTCACAGCAATGTA
PCS1 (105 bp amplicon)	F	GACTGGAACAGGGCATTCT
	R	GGAATCCAATGAGGAGGGTATTT
GSH-ligase (104 bp amplicon)	F	GAGGATGTTAGGTTGGGTCTTAC
	R	CCGTTGGATGATGTTGAAATGG

Table S2: List of primers used. Primers were designed using Integrated DNA Technologies primer design tools.

A)

Cadmium concentrations $\mu\text{g/g DW} \pm \text{SE}$									
Roots									
Treatment	Line	Vegetative	$\pm\text{SE}$	Anthesis	$\pm\text{SE}$	2WAA	$\pm\text{SE}$	4WAA	$\pm\text{SE}$
c0z2	Line 546	10.14	4.41	0.06	0.02	0.17	0.05	0.64	0.09
	Line 667	20.28	5.74	0.19	0.03	0.20	0.06	0.12	0.02
	Line 428	11.19	3.66	32.73	32.52	0.29	0.03	0.20	0.04
c0z10	Line 546	0.38	0.17	2.92	1.46	1.05	0.77	2.92	0.48
	Line 667	0.30	0.04	1.00	0.35	3.02	2.71	0.56	0.13
	Line 428	0.60	0.36	0.23	0.02	0.46	0.07	0.64	0.11
Stems									
Treatment	Line	Vegetative	$\pm\text{SE}$	Anthesis	$\pm\text{SE}$	2WAA	$\pm\text{SE}$	4WAA	$\pm\text{SE}$
c0z2	Line 546	1.38	0.73	0.03	0.00	0.03	0.01	0.05	0.01
	Line 667	1.18	0.05	0.01	0.00	0.01	0.00	0.05	0.01
	Line 428	0.93	0.29	0.03	0.01	0.03	0.00	0.02	0.00
c0z10	Line 546	0.06	0.05	0.06	0.09	0.12	0.06	0.22	0.17
	Line 667	0.04	0.01	0.09	0.13	0.20	0.13	0.09	0.04
	Line 428	-0.04	0.03	0.09	0.01	0.12	0.01	0.05	0.02
Lower leaves									
Treatment	Line	Vegetative	$\pm\text{SE}$	Anthesis	$\pm\text{SE}$	2WAA	$\pm\text{SE}$	4WAA	$\pm\text{SE}$
c0z2	Line 546	0.68	0.49	0.02	0.00	0.02	0.01	0.06	0.03
	Line 667	0.78	0.04	0.02	0.00	0.01	0.00	0.04	0.01
	Line 428	0.68	0.24	0.03	0.01	0.01	0.00	0.01	0.00
c0z10	Line 546	0.08	0.05	0.02	0.04	0.00	0.13	0.14	0.12
	Line 667	0.06	0.01	0.02	0.04	0.18	0.09	0.06	0.01
	Line 428	-0.03	0.04	0.11	0.02	0.12	0.04	0.09	0.01

B)

Cadmium concentrations $\mu\text{g/g DW} \pm \text{SE}$							
Flag leaves							
Treatment	Line	Anthesis	$\pm\text{SE}$	2WAA	$\pm\text{SE}$	4WAA	$\pm\text{SE}$
c0z2	Line 546	0.17	0.01	0.10	0.06	0.12	0.05
	Line 667	0.16	0.01	0.16	0.01	0.16	0.01
	Line 428	0.15	0.01	0.18	0.02	0.15	0.00
c0z10	Line 546	0.07	0.04	0.02	0.04	0.04	0.06
	Line 667	0.01	0.03	0.03	0.04	0.19	0.02
	Line 428	0.05	0.01	0.11	0.02	0.13	0.03
Penducles							
Treatment	Line			2WAA	$\pm\text{SE}$	4WAA	$\pm\text{SE}$
c0z2	Line 546			0.05	0.01	0.05	0.02
	Line 667			0.05	0.01	0.06	0.01
	Line 428			0.06	0.01	0.04	0.01
c0z10	Line 546			-0.12	0.00	-0.02	0.02
	Line 667			0.02	0.03	0.04	0.00
	Line 428			0.10	0.02	0.03	0.01
Rachis							
Treatment	Line	Anthesis	$\pm\text{SE}$	2WAA	$\pm\text{SE}$	4WAA	$\pm\text{SE}$
c0z2	Line 546	0.09	0.01	0.04	0.04	0.07	0.02
	Line 667	0.08	0.00	0.09	0.00	0.09	0.00
	Line 428	0.10	0.02	0.12	0.03	0.00	0.00
c0z10	Line 546	0.01	0.06	0.03	0.02	0.01	0.02
	Line 667	-0.01	0.04	-0.01	0.03	0.14	0.03
	Line 428	0.11	0.07	0.12	0.03	0.07	0.01
Grains							
Treatment	Line	Anthesis	$\pm\text{SE}$	2WAA	$\pm\text{SE}$	4WAA	$\pm\text{SE}$
c0z2	Line 546	0.18	0.14	0.00	0.03	0.06	0.06
	Line 667	0.02	0.00	0.03	0.00	0.03	0.01
	Line 428	0.03	0.01	0.02	0.00	0.03	0.01
c0z10	Line 546	0.00	0.02	0.03	0.03	0.02	0.01
	Line 667	0.01	0.05	0.03	0.03	0.04	0.01
	Line 428	0.08	0.02	0.11	0.02	0.03	0.02

Table S3: Cadmium Concentrations in vegetative (A) and reproductive (B) tissues of 3 rice lines grown in the absence of Cd. Plants were grown in hydroponics containing 0 μM Cd + 2 μM Zn or 0

μM Cd + 10 μM Zn and harvested at predetermined stages (Vegetative, Anthesis, 2 weeks after anthesis (2WAA), or 4 weeks after anthesis (4WAA))

Roots						
Vegetative	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	*	ns	****	**	**	****
Line 667	ns	ns	***	*	**	****
Line 428	****	ns	**	****	**	***
Anthesis	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	****	ns	****	****	ns	****
Line 667	***	ns	****	****	ns	****
Line 428	***	ns	****	****	ns	****
2WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	**	ns	****	**	ns	****
Line 667	***	ns	****	**	****	****
Line 428	**	ns	****	**	*	****
4WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	***	ns	****	****	ns	****
Line 667	****	ns	****	****	***	****
Line 428	****	ns	****	****	ns	****
Stems						
Vegetative	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	***	ns	****	****	****	****
Line 667	ns	ns	****	ns	****	****
Line 428	****	ns	****	****	****	****
Anthesis	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	****	ns	****	****
Line 667	****	ns	*	****	ns	*
Line 428	****	ns	****	****	ns	****
2WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	****	ns	****	****
Line 667	**	ns	****	**	ns	****
Line 428	****	ns	****	****	ns	****
4WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	*	*	ns	*
Line 667	****	ns	****	****	ns	****
Line 428	****	ns	****	****	****	****
Lower leaves						
Vegetative	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	****	ns	****	****	****	****
Line 667	ns	ns	****	ns	****	****
Line 428	****	ns	****	****	**	****
Anthesis	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	ns	ns	ns	ns
Line 667	ns	ns	**	ns	ns	***
Line 428	****	ns	****	****	****	****
2WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	**	ns	*	**
Line 667	****	ns	****	****	*	****
Line 428	****	ns	*	****	**	*
4WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	ns	ns	ns	ns
Line 667	****	ns	****	****	ns	****
Line 428	****	ns	****	****	ns	***

Table S4: Effect of zinc fertilization on cadmium concentration in vegetative tissues: Variance was compared using 2-way ANOVA with a multiple comparison test and Tukey correction. asterisks (*)

indicate significant difference between treatments at a particular reproductive stage and line (P<0.05 * to P<0.0001 ****).

Flag leaf						
Anthesis	c0z2 * c1z2	c0z2 * c0z10	c0z2 *c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	ns	ns	ns	ns
Line 667	****	ns	ns	****	****	ns
Line 428	****	ns	****	****	ns	****
2WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 *c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	**	ns	*	**
Line 667	ns	ns	**	**	ns	***
Line 428	ns	ns	ns	ns	ns	*
4WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 *c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	ns	ns	ns	ns
Line 667	****	ns	ns	****	****	ns
Line 428	*	ns	****	*	****	****

Peduncle						
2WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 *c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	***	ns	*	***
Line 667	ns	ns	*	ns	ns	**
Line 428	ns	ns	****	ns	*	****
4WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 *c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	ns	ns	ns	*
Line 667	**	ns	*	**	ns	*
Line 428	****	ns	****	****	****	****

Rachis						
Anthesis	c0z2 * c1z2	c0z2 * c0z10	c0z2 *c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	**	ns	*	**
Line 667	ns	ns	ns	ns	ns	ns
Line 428	****	ns	****	****	ns	****
2WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 *c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	****	ns	****	****
Line 667	****	ns	**	****	ns	**
Line 428	***	ns	***	***	ns	***
4WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 *c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	ns	ns	ns	ns
Line 667	**	ns	**	**	ns	**
Line 428	****	ns	****	****	**	****

Grains						
Anthesis	c0z2 * c1z2	c0z2 * c0z10	c0z2 *c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	**	ns	ns	**
Line 667	*	ns	ns	*	ns	ns
Line 428	****	ns	****	****	****	****
2WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 *c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	****	ns	****	****
Line 667	***	ns	****	***	ns	****
Line 428	**	ns	****	**	ns	****
4WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 *c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	****	ns	**	****
Line 667	****	ns	**	****	ns	**
Line 428	****	ns	****	****	****	****

Table S5: Effect of zinc fertilization on cadmium concentration in reproductive tissues: Variance was compared using 2-way ANOVA with a multiple comparison test and Tukey correction. asterisks

(*) indicate significant difference between treatments at a particular reproductive stage and line (P<0.05 * to P<0.0001 ****).

Roots						
Vegetative	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	****	****	****	****	ns
Line 667	ns	****	****	****	****	ns
Line 428	ns	ns	ns	*	ns	ns
Anthesis	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	****	****	****	****	****
Line 667	ns	****	****	****	****	ns
Line 428	ns	****	****	****	****	ns
2WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	*	ns	ns	ns
Line 667	ns	**	*	**	**	ns
Line 428	ns	**	ns	**	ns	ns
4WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	****	****	****	****	*
Line 667	ns	****	****	****	****	ns
Line 428	ns	****	****	****	****	****
Stems						
Vegetative	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	****	****	****	****	ns
Line 667	ns	****	****	****	****	ns
Line 428	ns	****	****	****	****	****
Anthesis	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	ns	ns	ns	ns
Line 667	ns	*	*	*	*	ns
Line 428	ns	****	****	****	****	ns
2WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	ns	ns	ns	ns
Line 667	ns	ns	ns	ns	ns	ns
Line 428	ns	*	****	ns	**	ns
4WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	****	ns	****	ns	****
Line 667	ns	ns	ns	ns	ns	ns
Line 428	ns	****	****	****	****	ns
Lower leaves						
Vegetative	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	****	****	****	****	ns
Line 667	ns	**	*	***	*	ns
Line 428	ns	****	ns	****	*	****
Anthesis	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	ns	ns	ns	ns
Line 667	ns	***	**	***	**	ns
Line 428	ns	ns	****	ns	****	***
2WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	ns	ns	ns	ns
Line 667	ns	****	**	****	**	ns
Line 428	ns	ns	*	ns	ns	ns
4WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 * c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	ns	ns	ns	ns
Line 667	ns	ns	****	ns	****	****
Line 428	ns	****	****	*	*	ns

Table S6: Effect of cadmium and zinc fertilization on zinc concentration in vegetative tissues: Variance was compared using 2-way ANOVA with a multiple comparison test and Tukey correction.

asterisks (*) indicate significant difference between treatments at a particular reproductive stage and line (P<0.05 * to P<0.0001 ****).

Flag leaf						
Anthesis	c0z2 * c1z2	c0z2 * c0z10	c0z2 *c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	ns	ns	ns	ns
Line 667	ns	***	ns	****	*	ns
Line 428	ns	ns	**	ns	ns	ns
2WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 *c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	ns	ns	ns	ns
Line 667	ns	*	*	**	**	ns
Line 428	ns	ns	ns	**	ns	*
4WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 *c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	ns	ns	ns	ns
Line 667	ns	ns	ns	ns	ns	ns
Line 428	ns	ns	****	ns	***	**

Peduncle						
2WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 *c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	****	ns	****	ns	****
Line 667	ns	**	*	**	**	ns
Line 428	ns	**	ns	****	*	ns
4WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 *c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	**	*	****	****	ns
Line 667	ns	****	**	****	****	****
Line 428	ns	*	****	ns	**	ns

Rachis						
Anthesis	c0z2 * c1z2	c0z2 * c0z10	c0z2 *c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	ns	ns	ns	ns
Line 667	ns	**	*	**	**	ns
Line 428	ns	****	**	ns	ns	ns
2WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 *c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	ns	ns	ns	ns
Line 667	ns	*	ns	**	*	ns
Line 428	ns	****	****	****	****	ns
4WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 *c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	**	ns	***	ns	*
Line 667	ns	ns	*	****	****	ns
Line 428	ns	****	**	****	****	ns

Grains						
Anthesis	c0z2 * c1z2	c0z2 * c0z10	c0z2 *c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	ns	ns	ns	ns
Line 667	ns	**	****	**	****	ns
Line 428	ns	***	**	****	****	ns
2WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 *c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	*	ns	****	ns	ns
Line 667	ns	****	****	****	****	ns
Line 428	ns	***	****	**	****	ns
4WAA	c0z2 * c1z2	c0z2 * c0z10	c0z2 *c1z10	c1z2 * c0z10	c1z2 * c1z10	c0z10 * c1z10
Line 546	ns	ns	*	**	****	ns
Line 667	ns	ns	ns	*	*	ns
Line 428	ns	*	****	ns	ns	ns

Table S7: Effect of cadmium and zinc fertilization on zinc concentration in reproductive tissues: Variance was compared using 2-way ANOVA with a multiple comparison test and Tukey correction.

asterisks (*) indicate significant difference between treatments at a particular reproductive stage and line (P<0.05 * to P<0.0001 ****).

	Mineral Conc. (µg/g DW) ± SE		
	c0z2		
	546	667	428
Ca	102.03 ± 8.3 ^a	103.01 ± 7.03 ^b	131.37 ± 14.9 ^{b, x}
Cu	6.38 ± 1.12 ^a	7.71 ± 0.09 ^{ab}	9.40 ± 0.65 ^b
Fe	18.18 ± 5.46 ^a	15.28 ± 0.86 ^a	30.98 ± 4.72 ^{b, x}
Mg	1358.99 ± 24.19 ^{a, x}	1608.48 ± 97.08 ^{b, x}	1213.23 ± 59.47 ^{a, x}
Mn	24.32 ± 2.46 ^{a, x}	11.09 ± 0.89 ^b	10.72 ± 0.66 ^{b, x}
Ni	1.71 ± 0.63 ^{a, x}	6.96 ± 0.24 ^b	10.19 ± 0.13 ^{c, x}
P	2763.47 ± 46.27 ^{a, xy}	4022.68 ± 162.44 ^b	3512.65 ± 126.82 ^{c, x}
	c1z2		
	546	667	428
Ca	140.62 ± 14.7 ^a	69.25 ± 4.85 ^b	229.96 ± 26.1 ^{c, y}
Cu	5.76 ± 0.5 ^a	8.75 ± 0.51 ^b	11.12 ± 0.06 ^c
Fe	14.67 ± 1.75 ^a	20.19 ± 0.5 ^a	55.56 ± 2.68 ^{b, y}
Mg	1155.87 ± 38.41 ^{a, y}	1357.62 ± 17.61 ^{b, y}	1621.95 ± 16.07 ^{c, y}
Mn	5.27 ± 0.58 ^{a, y}	9.06 ± 0.45 ^{ab}	10.62 ± 0.16 ^{b, x}
Ni	11.24 ± 1.4 ^{a, y}	8.2 ± 0.33 ^b	11.58 ± 0.19 ^{a, x}

P	2588.96 ± 41.92 ^a	3672.58 ± 189.34 ^b	3633.39 ± 52.04 ^{b, x}
c0z10			
	546	667	428
Ca	100.07 ± 15.93 ^a	96.88 ± 15.93 ^a	137.97 ± 22.8 ^{b,x}
Cu	6.39 ± 0.68 ^a	8.79 ± 0.68 ^b	7.71 ± 0.54 ^a
Fe	15.67 ± 5.02 ^a	18.59 ± 1.72 ^a	21.67 ± 5.02 ^{a,x}
Mg	1347.75 ± 62.04 ^{a, x}	1500.93 ± 88.28 ^{b, xy}	1408.95 ± 36.21 ^{a, xy}
Mn	22.13 ± 4.23 ^{a, x}	11.4 ± 1.49 ^b	11.58 ± 1.8 ^{b,x}
Ni	1.76 ± 0.57 ^{a, x}	8.42 ± 0.53 ^b	11.28 ± 0.65 ^{c,x}
P	2686.02 ± 269.07 ^{a, xy}	4049.78 ± 270.3 ^b	2936.08 ± 200.82 ^{a,xy}
c1z10			
	546	667	428
Ca	96.69 ± 5.67 ^a	77.95 ± 4.69 ^b	99.66 ± 12.72 ^{b, x}
Cu	6.75 ± 0.46 ^a	7.38 ± 0.17 ^a	9.88 ± 0.16 ^b
Fe	9.84 ± 3.23 ^a	14.8 ± 0.64 ^a	26.73 ± 2.69 ^{b, x}
Mg	1417.82 ± 37.79 ^{a, x}	1336.84 ± 13.31 ^{a, y}	1556.22 ± 13.54 ^{b, y}
Mn	11.83 ± 0.78 ^{a, x}	7.26 ± 0.31 ^b	17.55 ± 1.32 ^{c, y}
Ni	2.49 ± 0.32 ^{a, x}	7.63 ± 0.14 ^b	14.46 ± 0.96 ^{c, y}
P	3071.24 ± 145.49 ^a	3781.59 ± 104.94 ^b	2769.52 ± 65.08 ^{a, y}

Table S8. Mineral concentrations in grains of 3 rice cultivars grown c0z2, c1z2, c0z10, and c1z10: Plants were harvested 4 weeks after anthesis. Values represent mean (n=3) ± standard error.

Different letters signify statistically significant difference between lines within a treatment (a,b,c) or between treatments within a line (w,x,y,z) 0mM Cd+ 2mM Zn. 2way ANOVA with a Tukey correction P<0.05.

A)

	Ca	Cu	Fe	Mg	Mn	Ni	P	S	Zn
Line 546	ns	ns	ns	ns	ns	ns	ns	ns	ns
Line 667	0.93	ns	ns	ns	ns	0.88	-0.82	ns	ns
Line 428	ns	ns	ns	ns	ns	ns	ns	ns	ns

B)

	Ca	Cu	Fe	Mg	Mn	Ni	P	S	Zn
Line 546	ns	ns	ns	ns	ns	ns	ns	ns	ns
Line 667	ns	ns	ns	ns	ns	ns	ns	ns	ns
Line 428	ns	ns	ns	ns	0.97	ns	ns	ns	ns

Table S9: Correlations between grain Cd and essential minerals under 1 µM Cd + 2 µM Zn (c1z2) (A) and 1 µM Cd + 10 µM Zn (c1z10) (B) treatments in the three rice lines, 546, 667, and 428: Data signify Pearson’s correlation coefficient P<0.05. ns= no significance.