

Table S1. Germination percentage, electrolyte leakage of seed membrane, and root length sum of wheat seeds after 48h of germination. Five soaking periods (SP), six soaking concentrations with sodium selenate (S), and interaction SP × S. Values are mean ± SE. Different letters demonstrate significant differences ($p < 0.05$).

	Germination (%)	Electrolyte Leakage (%)	Root Length (mm)
Soaking Period (SP)			
0h	97.3 ± 1.35 ab	12.3 ± 0.36 c	32.1 ± 1.64 d
4h	95.3 ± 0.85 b	12.9 ± 0.69 c	41.5 ± 1.61 c
9h	98.6 ± 0.35 a	15.8 ± 0.56 b	57.1 ± 1.75 b
12h	95.2 ± 1.31 ab	16.7 ± 0.65 b	84.3 ± 2.52 a
24h	97.4 ± 0.68 ab	18.0 ± 0.72 a	63.7 ± 1.91 b
Soaking (S)			
0 mM	98.1 ± 0.61 a	14.8 ± 0.70 b	52.4 ± 3.12 bc
0.25 mM	95.6 ± 1.02 a	14.4 ± 0.49 b	66.1 ± 2.94 a
0.50 mM	97.0 ± 0.95 a	15.2 ± 0.78 ab	64.9 ± 3.23 a
2.5 mM	96.8 ± 0.94 a	14.0 ± 0.75 b	64.6 ± 3.06 a
5 mM	98.5 ± 0.42 a	14.1 ± 0.65 b	60.9 ± 3.28 ab
25 mM	93.2 ± 1.74 b	16.9 ± 1.12 a	46.9 ± 2.79 c
SP x S			
0h	0 mM	97.3 ± 1.35 ab	32.1 ± 1.64 k
4h	0 mM	99.0 ± 0.58 a	37.5 ± 4.73 k
	0.25 mM	92.9 ± 0.68 ab	44.0 ± 3.95 hijk
	0.50 mM	91.9 ± 0.59 ab	39.0 ± 3.47 jk
	2.5 mM	98.7 ± 0.88 ab	51.9 ± 3.23 fghijk
	5 mM	97.7 ± 1.20 ab	37.2 ± 3.19 jk
	25 mM	91.6 ± 1.44 ab	38.8 ± 3.23 ijk
9h	0 mM	99.3 ± 0.67 a	62.1 ± 3.23 cdefghi
	0.25 mM	98.7 ± 0.88 ab	63.7 ± 3.29 cdefgh
	0.50 mM	98.3 ± 1.20 ab	58.8 ± 3.84 efghij
	2.5 mM	98.3 ± 0.88 ab	47.8 ± 3.76 ghijk
	5 mM	98.7 ± 0.88 a	66.4 ± 4.38 cdefgh
	25 mM	98.0 ± 1.15 ab	44.3 ± 3.22 hijk
12h	0 mM	98.3 ± 0.88 ab	93.6 ± 5.82 a
	0.25 mM	91.9 ± 0.59 ab	89.6 ± 4.37 ab
	0.50 mM	99.0 ± 0.58 a	89.3 ± 4.03 ab
	2.5 mM	98.3 ± 0.88 ab	84.4 ± 5.40 abc
	5 mM	99.0 ± 0.58 ab	81.8 ± 5.91 abcd
	25 mM	84.8 ± 0.78 b	59.3 ± 8.58 defghijk
24h	0 mM	98.3 ± 0.88 ab	70.2 ± 3.43 bcdefg
	0.25 mM	99.0 ± 0.58 a	65.4 ± 2.90 cdefgh
	0.50 mM	98.7 ± 0.67 ab	70.7 ± 2.85 bcdef
	2.5 mM	91.7 ± 0.01 ab	75.0 ± 2.82 abcde
	5 mM	98.7 ± 0.88 ab	56.7 ± 4.29 efghijk
	25 mM	98.3 ± 0.88 ab	46.5 ± 5.43 hijk
Two-way ANOVA (p-values)			
SP	<0.0001	<0.0001	<0.0001
S	0.0170	0.0090	<0.0001
SP x S	0.0040	0.0420	<0.0001

Table S2. Seedling height (mm), number of leaves, length of total leaves (mm) number of visible tillers and tillers length (mm), of wheat seedlings developed from fourteen (emergence) to fifty-six days after sowing (DAS). Values are means \pm SE ($n = 80$). Different letters demonstrate significant differences ($p < 0.05$).

	Seedling Height (mm)	Leaves Number (nº)	Length of Total Leaves (mm)	Tillers Number (nº)	Tillers Length (mm)
Days After Sowing (DAS)					
14	8.0 \pm 0.29 f	0.8 \pm 0.02 g	8.0 \pm 0.29 g	0.0 \pm 0.00 c	0.0 \pm 0.00 c
21	60 \pm 0.51 e	1.0 \pm 0.01 f	60 \pm 0.51 f	0.0 \pm 0.00 c	0.0 \pm 0.00 c
28	76 \pm 0.55 d	2.0 \pm 0.01 e	133 \pm 1.17 e	0.0 \pm 0.00 c	0.0 \pm 0.00 c
35	92 \pm 0.75 c	2.6 \pm 0.02 d	184 \pm 1.76 d	0.0 \pm 0.00 c	0.0 \pm 0.00 c
42	98 \pm 0.74 b	2.9 \pm 0.01 c	222 \pm 2.12 c	0.0 \pm 0.01 c	0.0 \pm 0.00 c
49	101 \pm 0.74 ab	3.6 \pm 0.02 b	296 \pm 3.30 b	0.5 \pm 0.02 b	13.9 \pm 0.87 b
56	103 \pm 0.79 a	4.1 \pm 0.02 a	390 \pm 5.07 a	0.9 \pm 0.04 a	34.1 \pm 1.32 a
Soaking (S)					
	Untreated	74 \pm 1.02 b	2.4 \pm 0.04 b	180 \pm 3.99	0.225 \pm 0.02 a
	Water	77 \pm 1.60 a	2.3 \pm 0.05 b	178 \pm 5.77	0.174 \pm 0.02 b
	2.5mM	79 \pm 1.14 a	2.4 \pm 0.04 b	185 \pm 4.25	0.169 \pm 0.01 b
	25mM	73 \pm 1.09 b	2.5 \pm 0.04 a	183 \pm 4.34	0.241 \pm 0.02 a
DAS x S					
14	Untreated	5.0 \pm 0.35 l	0.7 \pm 0.03 j	5.0 \pm 0.35 h	0.0 \pm 0.00 f
	Water	10 \pm 0.75 kl	0.8 \pm 0.04 hi	10 \pm 0.75 h	0.0 \pm 0.00 f
	2.5mM	11 \pm 0.61 k	0.9 \pm 0.03 hi	11 \pm 0.61 h	0.0 \pm 0.00 f
	25mM	8.0 \pm 0.55 kl	0.7 \pm 0.04 ij	8.0 \pm 0.55 h	0.0 \pm 0.00 f
21	Untreated	57 \pm 0.66 j	1.0 \pm 0.01 h	57 \pm 0.66 g	0.0 \pm 0.00 f
	Water	62 \pm 1.10 j	1.0 \pm 0.01 h	62 \pm 1.10 g	0.0 \pm 0.00 f
	2.5mM	62 \pm 1.18 j	1.0 \pm 0.01 h	62 \pm 1.18 g	0.0 \pm 0.00 f
	25mM	60 \pm 1.04 j	1.0 \pm 0.01 h	60 \pm 1.04 g	0.0 \pm 0.00 f
28	Untreated	74 \pm 0.93 i	2.0 \pm 0.01 g	128 \pm 1.95 f	0.0 \pm 0.00 f
	Water	79 \pm 1.64 hi	2.0 \pm 0.01 g	134 \pm 3.53 f	0.0 \pm 0.00 f
	2.5mM	80 \pm 0.99 h	2.0 \pm 0.01 g	139 \pm 2.15 f	0.0 \pm 0.00 f
	25mM	74 \pm 1.04 hi	2.0 \pm 0.01 g	132 \pm 2.28 f	0.0 \pm 0.00 f
35	Untreated	91 \pm 1.16 g	2.5 \pm 0.04 f	179 \pm 2.81 e	0.0 \pm 0.00 f
	Water	93 \pm 2.15 efg	2.4 \pm 0.06 f	182 \pm 4.67 e	0.0 \pm 0.00 f
	2.5mM	96 \pm 1.51 efg	2.5 \pm 0.04 f	190 \pm 3.49 e	0.0 \pm 0.00 f
	25mM	89 \pm 1.53 g	2.7 \pm 0.04 e	186 \pm 3.66 e	0.0 \pm 0.00 f
42	Untreated	96 \pm 1.15 def	2.9 \pm 0.02 d	215 \pm 3.54 d	0.0 \pm 0.00 f
	Water	100 \pm 2.41 abcdef	2.9 \pm 0.04 de	221 \pm 6.40 d	0.0 \pm 0.00 f
	2.5mM	103 \pm 1.36 abc	2.9 \pm 0.02 d	230 \pm 3.86 d	0.0 \pm 0.00 f
	25mM	93 \pm 1.40 fg	3.0 \pm 0.02 d	222 \pm 4.23 d	0.0 \pm 0.00 f
49	Untreated	100 \pm 1.18 bcdef	3.5 \pm 0.04 c	296 \pm 5.79 c	0.5 \pm 0.01 de
	Water	101 \pm 2.21 abcdef	3.5 \pm 0.06 c	288 \pm 8.85 c	0.4 \pm 0.10 de
	2.5mM	104 \pm 1.52 ab	3.5 \pm 0.04 c	301 \pm 6.21 c	0.4 \pm 0.01 e
	25mM	97 \pm 1.37 cdef	3.7 \pm 0.04 b	295 \pm 6.55 c	0.6 \pm 0.01 cd
56	Untreated	103 \pm 1.29 ab	4.1 \pm 0.04 a	406 \pm 9.33 a	1.1 \pm 0.10 a
	Water	104 \pm 2.44 abcd	4.0 \pm 0.03 a	369 \pm 12.4 b	0.8 \pm 0.10 bc
	2.5mM	107 \pm 1.65 a	4.0 \pm 0.03 a	383 \pm 9.82 ab	0.8 \pm 0.10 b
	25mM	99 \pm 1.32 abc	4.1 \pm 0.03 a	389 \pm 9.42 ab	1.0 \pm 0.10 a
Two-way ANOVA (p-values)					
DAS	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
S	<0.0001	<0.0001	0.1282	<0.0001	<0.0001
DAS x S	0.0349	<0.0001	0.0047	<0.0001	<0.0001

Table S3. Net photosynthetic rate (A, $\mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$), respiration rate (E, g $\text{H}_2\text{O m}^{-2} \text{ h}^{-1}$), stomatal conductance (gs, $\text{mmol H}_2\text{O m}^{-2} \text{ s}^{-1}$), intrinsic water use efficiency (A/gs, $\mu\text{mol mol}^{-1}$), and ratio of intercellular to atmospheric CO_2 concentration (C_i/C_a) among wheat plants (means \pm SE, n=12) under two water regimes (W) and four soaking treatments (S). Different letters demonstrate significant differences ($p < 0.05$).

	A	E	gs	A/gs	C _i /C _a
Watering Regime (W)					
WW	22.9 \pm 1.41 a	5.19 \pm 0.34 a	497 \pm 54.0 a	49.8 \pm 3.84 b	0.719 \pm 0.016
WD	16.1 \pm 0.60 b	3.70 \pm 0.20 b	294 \pm 15.7 b	55.4 \pm 1.73 a	0.723 \pm 0.008
Soaking (S)					
Untreated	17.6 \pm 1.17 b	3.87 \pm 0.472 b	332 \pm 42.1 b	57.5 \pm 3.74 ab	0.714 \pm 0.013
Water	20.1 \pm 1.84 ab	4.60 \pm 0.406 ab	419 \pm 51.5 a	49.4 \pm 2.64 b	0.73 \pm 0.013
2.5 mM Se	20.6 \pm 2.17 a	4.90 \pm 0.522 a	465 \pm 76.1 a	48.1 \pm 3.68 b	0.74 \pm 0.013
25 mM Se	17.4 \pm 1.21 b	3.76 \pm 0.228 b	293 \pm 22.4 b	60.3 \pm 2.79 a	0.694 \pm 0.013
W x S					
WW	Untreated	20.2 \pm 0.81	5.11 \pm 0.200	428 \pm 31.7 bc	0.742 \pm 0.011
	Water	25.1 \pm 1.17	5.66 \pm 0.181	553 \pm 48.8 ab	0.726 \pm 0.023
	2.5 mM Se	25.5 \pm 2.12	6.01 \pm 0.508	647 \pm 66.2 a	0.752 \pm 0.025
	25 mM Se	18.7 \pm 1.87	4.02 \pm 0.235	305 \pm 25.4 cd	0.680 \pm 0.023
WD	Untreated	14.4 \pm 0.95	2.63 \pm 0.448	212 \pm 17.0 d	0.685 \pm 0.016
	Water	16.4 \pm 0.49	3.81 \pm 0.264	318 \pm 14.9 cd	0.733 \pm 0.018
	2.5 mM Se	15.6 \pm 1.13	3.80 \pm 0.453	283 \pm 24.4 cd	0.728 \pm 0.006
	25 mM Se	16.2 \pm 1.54	3.50 \pm 0.379	281 \pm 40.2 cd	0.707 \pm 0.013
Two-way ANOVA (p-values)					
W	0.0001	0.0001	0.0001	0.0015	0.3328
S	0.0208	0.0071	0.0001	0.0046	0.0686
W x S	0.0524	0.0559	0.0011	0.0250	0.0826

Table S4. Maximum (Fv/Fm) and actual quantum efficiency of photosystem II (Φ_{PSII}), maximum efficiency of PSII at open reaction centers (F'v/F'm), photochemical quenching (qP), non-photochemical quenching (NPQ), apparent electron transport rate (ETR, $\mu\text{mol e}^- \text{ m}^{-2} \text{ s}^{-1}$), quantum yield of non-regulated energy dissipation in PSII (Φ_{NO}), quantum yield of regulated energy dissipation in PSII (Φ_{NPQ}) among wheat plants in two water regimes (W) and four soaking treatments (S). Values are means \pm SE (n=12). Different letters indicate statistically significant differences ($p < 0.05$).

Table S5. Chlorophyll *a* (Chl *a*, mg g⁻¹ DW), chlorophyll *b* (Chl *b*, mg g⁻¹ DW), chlorophyll *a+b* (Chl (*a+b*), mg g⁻¹ DW), chlorophyll ratio (Chl *a*/Chl *b*), carotenoids (car, mg g⁻¹ DW), and chlorophyll/carotenoids ratio (Chl/Car) of wheat plants. Two water regimes (W) and four soaking treatments (S) were performed. Values are means ± SE of DW (n = 12). Different letters indicate statistically significant differences (*p* < 0.05).

	Chl <i>a</i>	Chl <i>b</i>	Car	Chl <i>a+b</i>	Chl <i>a</i> /Chl <i>b</i>	Chl/Car
Watering Regime (W)						
WW	14.6 ± 0.353 a	8.23 ± 0.201 a	3.54 ± 0.075 a	21.6 ± 0.515 a	1.77 ± 0.007 a	6.05 ± 0.035 a
WD	10.3 ± 0.157 b	6.22 ± 0.098 b	2.70 ± 0.037 b	15.7 ± 0.243 b	1.67 ± 0.009 b	5.83 ± 0.041 b
Soaking (S)						
Untreat	13.9 ± 0.146 a	7.68 ± 0.110 b	3.52 ± 0.040 a	20.4 ± 0.240 a	1.86 ± 0.010 a	5.86 ± 0.041 bc
Water	14.0 ± 0.581 a	8.14 ± 0.299 a	3.36 ± 0.122 a	20.9 ± 0.825 a	1.71 ± 0.015 c	6.13 ± 0.048 a
2.5 mM Se	10.8 ± 0.312 c	6.37 ± 0.130 d	2.76 ± 0.066 c	16.3 ± 0.411 c	1.70 ± 0.015 c	5.92 ± 0.026 b
25 mM Se	12.5 ± 0.534 b	7.12 ± 0.266 c	3.21 ± 0.111 b	18.6 ± 0.747 b	1.75 ± 0.013 b	5.77 ± 0.046 c
W x S						
WW	Untreated	14.4 ± 0.116 b	8.11 ± 0.105 b	3.60 ± 0.040 b	21.3 ± 0.175 b	1.78 ± 0.022 ab
	Water	16.6 ± 0.404 a	9.43 ± 0.292 a	3.96 ± 0.075 a	24.7 ± 0.658 a	1.77 ± 0.015 bc
	2.5 mM Se	12.3 ± 0.073 d	6.97 ± 0.050 c	3.05 ± 0.027 d	18.2 ± 0.112 d	1.76 ± 0.007 bc
	25 mM Se	15.1 ± 0.099 b	8.40 ± 0.049 b	3.75 ± 0.037 b	22.2 ± 0.120 b	1.79 ± 0.011 ab
WD	Untreat	13.3 ± 0.170 c	7.26 ± 0.089 c	3.42 ± 0.046 c	19.5 ± 0.233 c	1.84 ± 0.014 a
	Water	11.5 ± 0.121 d	6.96 ± 0.084 c	2.91 ± 0.038 d	17.5 ± 0.186 d	1.66 ± 0.012 de
	2.5 mM Se	9.4 ± 0.104 f	5.77 ± 0.057 d	2.45 ± 0.033 f	14.3 ± 0.143 e	1.63 ± 0.010 e
	25 mM Se	10.2 ± 0.088 e	5.94 ± 0.079 d	2.73 ± 0.028 e	15.3 ± 0.148 e	1.71 ± 0.016 cd
Two-way ANOVA (<i>p</i>-values)						
	W	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	S	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	W x S	<0.0001	<0.0001	<0.0001	<0.0001	0.1197
						0.0660

Table S6. Total Phenols (TPC, mg GAE g⁻¹ DW), total flavonoids (TFC, mg CE g⁻¹ DW), ortho-diphenols (OD, mg GAE g⁻¹ DW), ABTS⁺, (μM TE g⁻¹ DW), total soluble sugars (TSS, mg g⁻¹ DW), and total soluble proteins (TSP, mg g⁻¹ DW) among two water regimes and four soaking treatments (untreated, 0, 2.5, and 25 mM). Values are means ± SE of DW (n = 12). Different letters indicate statistically significant differences (*p* < 0.05).

	TPC	TFC	OD	ABTS ⁺	TSS	TSP
Watering Regime (W)						
WW	23.42 ± 0.177 a	23.0 ± 1.88	176 ± 1.69 b	215 ± 2.18 a	210 ± 10.4	193 ± 3.98 a
WD	21.81 ± 0.289 b	24.8 ± 1.34	183 ± 1.52 a	199 ± 2.80 b	196 ± 3.92	158 ± 4.92 b
Soaking (S)						
Untreated	21.5 ± 0.32 c	24.7 ± 2.00 ab	173 ± 1.52 b	200 ± 1.74 b	200 ± 5.17 b	183 ± 2.41 a
Water	21.7 ± 0.36 bc	20.1 ± 1.77 b	178 ± 1.74 b	205 ± 3.97 b	201 ± 5.45 bc	183 ± 7.38 a
2.5 mM Se	23.7 ± 0.23 a	28.4 ± 1.95 a	184 ± 1.40 a	215 ± 2.58 a	216 ± 10.4 a	169 ± 5.38 b
25 mM Se	22.5 ± 0.22 b	23.4 ± 2.04 ab	177 ± 2.91 b	203 ± 3.47 b	185 ± 1.49 c	175 ± 6.70 ab
W x S						
WW Untreated	22.4 ± 0.36 b	23.5 ± 3.27	174 ± 1.89 bc	204 ± 3.56	194 ± 5.89 b	179 ± 3.57 ab
Water	23.4 ± 0.19 ab	15.0 ± 1.24	181 ± 2.76 ab	218 ± 3.32	193 ± 5.21 b	214 ± 7.74 a
2.5 mM Se	24.1 ± 0.33 a	27.8 ± 3.26	180 ± 1.51 ab	219 ± 3.17	239 ± 2.34 a	191 ± 4.28 ab
25 mM Se	22.7 ± 0.17 ab	25.8 ± 3.31	166 ± 2.20 c	208 ± 4.00	184 ± 3.43 b	176 ± 3.46 bc
WD Untreated	20.5 ± 0.38 c	26.3 ± 1.79	173 ± 2.46 bc	195 ± 6.20	210 ± 0.28 b	187 ± 2.89 ab
Water	20.4 ± 0.23 c	24.8 ± 2.49	175 ± 1.89 bc	190 ± 3.18	206 ± 7.22 b	155 ± 2.81 cd
2.5 mM Se	23.3 ± 0.24 ab	29.1 ± 1.48	188 ± 1.62 a	209 ± 3.46	194 ± 5.33 b	146 ± 3.31 d
25 mM Se	22.3 ± 0.45 b	20.4 ± 1.68	188 ± 2.13 a	198 ± 5.48	187 ± 1.50 b	174 ± 13.2 bc
Two-way ANOVA (p-values)						
W	<0.0001	0.2678	<0.0001	<0.0001	0.3990	<0.0001
S	<0.0001	0.0166	<0.0001	0.0080	0.0003	0.0418
W x S	0.0003	0.0510	<0.0001	0.0900	<0.0001	<0.0001