Table S1

Full Anova report for parameters in Table 2 from winter pot experiment

Parameter	Source of Variance	DF	F Ratio	Prob>F
Height	N treatment	4	5.3	0.007
	Genotype	1	228.9	<0.0001
	N treatment x Genotype	4	0.5	0.6850
Panicle Length	N treatment	4	5.5	0.0012
	Genotype	1	2.0	0.1598
	N treatment x Genotype	4	1.2	0.3188
Days to flowering (50%)	N treatment	4	12.1	<0.0001
	Genotype	1	179.0	<0.0001
	N treatment x Genotype	4	0.3	0.8821
Harvest Index (HI)	N treatment	4	6.9	0.0002
	Genotype	1	0.0003	0.9855
	N treatment x Genotype	4	0.1	0.9713
SPAD	N treatment	4	91.1	<0.0001
	Genotype	1	11.0	0.0019
	N treatment x Genotype	4	1.3	0.2679
Number of tillers	N treatment	4	49.7	<0.0001
	Genotype	1	215.9	<0.0001
	N treatment x Genotype	4	1.72	0.1647

Table S2

Full Anova report for parameters in Figure 3 and 4 from winter pot experiment

Parameter	Source of Variance	DF	F Ratio	Prob>F
Shoot dry weight	N treatment	4	49.9	<0.001
	Genotype	1	52.7	<0.001
	N treatment x Genotype	4	4.8	0.0028
Grain dry weight	N treatment	4	12.9	<0.0001
	Genotype	1	16.8	0.0002

	N treatment x Genotype	4	1.3	0.2697
Root dry weight	N treatment	4	24.3	<0.0001
	Genotype	1	100.0	<0.0001
	N treatment x Genotype	4	4.4	0.0047
Shoot N Concentration H1	N treatment	4	32.7	<0.0001
	Genotype	1	3.5	0.0668
	N treatment x Genotype	4	1.5	0.2011
Shoot N concentration H2	N treatment	4	26.12	<0.0001
	Genotype	1	1.16	0.2875
	N treatment x Genotype	4	1.2	0.3239
Grain N concentration	N treatment	4	88.9	<0.0001
	Genotype	1	0.1	0.7344
	N treatment x Genotype	4	3.6	0.0126
Total aboveground N uptake	N treatment	4	83.9	<0.0001
	Genotype	1	50.9	<0.0001
	N treatment x Genotype	4	9.2	<0.0001
Shoot P concentration H1	N treatment	4	55.3	<0.0001
	Genotype	1	0.1	0.7451
	N treatment x Genotype	4	0.5	0.7275
Shoot P Concentration H2	N treatment	4	20.8	<0.0001
	Genotype	1	1.2	0.2825
	N treatment x Genotype	4	0.7	0.6088
Grain P concentration	N treatment	4	19.7	<0.0001
	Genotype	1	49.3	<0.0001
	N treatment x Genotype	4	5.9	<0.0001
Total aboveground P uptake	N treatment	4	1.0	0.4435
	Genotype	1	3.7	0.0604

	N treatment x Genotype	4	1.0	0.4411
Shoot K concentration H1	N treatment	4	5.7	0.0010
	Genotype	1	5.9	0.0195
	N treatment x Genotype	4	1.0	0.4365
Shoot K Concentration H2	N treatment	4	8.1	<0.0001
	Genotype	1	1.6	0.2203
	N treatment x Genotype	4	0.5	0.7356
Grain K concentration	N treatment	4	0.2	0.9510
	Genotype	1	2.5	0.1209
	N treatment x Genotype	4	1.8	0.1431
Total aboveground K uptake	N treatment	4	37.1	<0.0001
	Genotype	1	32.0	<0.0001
	N treatment x Genotype	4	1.3	0.2627

Table S3

Full Anova Report for parameters in Table 3 from summer field experiment

Parameter	**Source of Variance**	**DF**	**F Ratio**	**Prob>F**
Height	Block	4	2.5	0.0659
	N treatment	3	0.2	0.8732
	Genotype	1	0.6	0.4537
	N treatment x Genotype	3	1.1	0.3780
Panicle Length	Block	4	1.9	0.1445
	N treatment	3	2.8	0.0609
	Genotype	1	1.3	0.2576
	N treatment x Genotype	3	0.5	0.6983
Days to flowering (50%)	Block	4	1.8	0.1539
	N treatment	3	1.4	0.2512

	Genotype	1	134.1	<0.0001
	N treatment x Genotype	3	0.1	0.9416
Harvest Index (HI)	Block	4	1.8	0.1514
	N treatment	3	1.3	0.2995
	Genotype	1	42.9	<0.0001
	N treatment x Genotype	3	0.6	0.5872
SPAD	Block	4	2.0	0.1235
	N treatment	3	12.0	<0.0001
	Genotype	1	0.4	0.5355
	N treatment x Genotype	3	1.7	0.1826
Number of tillers	Block	4	0.5	0.7134
	N treatment	3	2.0	0.1378
	Genotype	1	2.9	0.1806
	N treatment x Genotype	3	0.04	0.9890

Table S4

Full Anova Report for parameters in Figure 5-7 from summer field experiment

Parameter	**Source of Variance**	**DF**	**F Ratio**	**Prob>F**
Shoot Dry Matter	Block	4	1.1	0.3805
	N treatment	3	1.3	0.2810
	Genotype	1	0.08	0.7753
	N treatment x Genotype	3	0.42	0.7405
Grain Dry Matter	Block	4	2.7	0.0512
	N treatment	3	3.5	0.0279
	Genotype	1	59.1	<0.0001
	N treatment x Genotype	3	1.8	0.1716
Shoot N Concentration H1	Block	4	1.9	0.1301
	N treatment	3	4.0	0.0166
	Genotype	1	9.4	0.0048
	N treatment x Genotype	3	2.4	0.0925

Shoot N Concentration H2	Block	4	1`.6	0.1889
	N treatment	3	5.3	0.0053
	Genotype	1	5.9	0.0219
	N treatment x Genotype	3	0.8	0.5113
Grain N Concentration	Block	4	1.6	0.0512
	N treatment	3	11.0	0.0276
	Genotype	1	3.2	<0.0001
	N treatment x Genotype	3	0.7	0.1716
Shoot P concentration	Block	4	0.6	0.6805
	N treatment	3	9.5	0.0002
	Genotype	1	22.8	<0.0001
	N treatment x Genotype	3	0.3	0.8511
Shoot K Concentration	Block	4	1.2	0.3339
	N treatment	3	1.3	0.2909
	Genotype	1	1.3	0.2601
	N treatment x Genotype	3	0.1	0.9304