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| **Table S1.** Variables studied and the significance of the factors considered for plants grown in the low-fertile site  |
| Variable | Source of variability |
| Age category | Yield class | Age category × Yield class | *R*2 |
| Grain DW (g plant-1) | \*\*\* | \*\* | ns | 0.86 |
| Straw DW (g plant-1) | \*\* | \* | ns | 0.77 |
| Harvest Index | \* | ns | ns | 0.42 |
| Shoot biomass accumulation rate (g plant-1 day-1) | \*\* | \*\* | ns | 0.77 |
| Straw N concentration (mg g-1) | \*\*\* | \* | \* | 0.82 |
| Straw P concentration (mg g-1) | \*\* | ns | \* | 0.75 |
| Straw K concentration (mg g-1) | ns | ns | \* | 0.37 |
| Seed N concentration (mg g-1) | \* | \* | ns | 0.58 |
| Seed P concentration (mg g-1) | ns | ns | ns | 0.16 |
| Seed K concentration (mg g-1) | ns | ns | ns | 0.13 |
| Above ground N content (mg plant-1) | \* | \* | \* | 0.68 |
| Above ground P content (mg plant-1) | \* | \* | \* | 0.75 |
| Above ground K content (mg plant-1) | \*\* | \* | ns | 0.74 |
| N accumulation rate (mg plant-1 day-1) | ns | ns | \* | 0.49 |
| P accumulation rate (mg plant-1 day-1) | \* | \* | \* | 0.69 |
| K accumulation rate (mg plant-1 day-1) | \*\* | ns | ns | 0.74 |
| N harvest index (NHI) (%) | ns | ns | ns | 0.30 |
| P harvest index (PHI) (%) | ns | ns | ns | 0.27 |
| K harvest index (KHI) (%) | ns | ns | ns | 0.25 |
| Straw NUE (g mg-1) | \* | \* | ns | 0.58 |
| Straw PUE (g mg-1) | \* | ns | \* | 0.37 |
| Straw KUE (g mg-1) | ns | ns | ns | 0.28 |
| Seed NUE (g mg-1) | ns | ns | ns | 0.19 |
| Seed PUE (g mg-1) | ns | ns | ns | 0.12 |
| Seed KUE (g mg-1) | ns | ns | ns | 0.15 |
| Significant effects are indicated as; \*- P<0.05; \*\*- P<0.01; \*\*\*- P<0.001; ns, not significant. Note: *R*2 for the tested full model is given |

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| **Table S2**. Grain weight (with the husk), and tillering and panicle bearing capacity of rice varieties when grown in the low-fertile and fertile field conditions. mean± SE., n=3 |
| Variety | Thousand grain weight (g) | Number of tillers per plant | Number of panicles per plant |
|  | Low-fertile site | Fertile site | Low-fertile site | Fertile site | Low-fertile site | Fertile site |
| Bg250 | 18.5±3.6 | 24.8±0.2 | 3.5±0.2 | 5.9±0.3 | 3.0±0.6 | 5.0±0.0 |
| At308 | 19.4±0.4 | 19.5±0.7 | 4.7±0.7 | 6.2±0.6 | 2.3±0.3 | 5.3±0.9 |
| At306 | 23.3±0.8 | 23.7±0.2 | 5.1±0.2 | 7.6±1.0 | 4.3±0.9 | 6.3±0.3 |
| Bg300 | 24.9±0.5 | 24.9±0.5 | 4.0±0.3 | 6.0±0.5 | 3.3±0.3 | 5.0±0.6 |
| Bg305 | 23.7±0.1 | 23.7±0.6 | 5.7±0.3 | 7.2±0.2 | 3.3±0.9 | 6.0±0.6 |
| At303 | 28.0±0.8 | 26.3±1.8 | 3.7±0.1 | 8.3±0.3 | 3.0±0.6 | 6.0±0.6 |
| At307 | 21.5±0.4 | 21.4±0.2 | 3.0±0.2 | 6.8±1.0 | 2.7±0.3 | 4.7±0.3 |
| Bg304 | 23.8±1.4 | 22.6±0.6 | 5.8±0.5 | 8.4±1.1 | 4.7±0.3 | 6.3±0.7 |
| Bw272-6B | 16.4±0.4 | 16.6±0.2 | 4.4±0.1 | 7.6±0.5 | 3.7±0.3 | 4.3±0.3 |
| Bg360 | 14.3±0.3 | 13.5±0.8 | 9.0±1.0 | 9.4±0.2 | 3.7±0.3 | 6.3±1.2 |
| At364 | 24.5±0.8 | 24.6±0.1 | 5.6±0.5 | 8.1±0.5 | 4.3±0.3 | 5.7±0.3 |
| At353 | 27.5±0.6 | 26.8±1.1 | 6.2±0.8 | 8.2±1.1 | 4.7±0.3 | 6.0±1.2 |
| Ld365 | 13.5±1.0 | 17.0±1.2 | 6.2±0.1 | 8.3±0.3 | 4.7±0.7 | 6.0±0.6 |
| At362 | 20.5±2.7 | 25.8±0.7 | 4.9±1.2 | 7.7±0.3 | 5.3±1.9 | 6.0±0.6 |
| Bg11-11 | 14.6±0.6 | 15.6±1.9 | 6.1±0.3 | 9.4±0.2 | 4.3±0.3 | 7.0±1.0 |
| Bg403 | 25.1±2.1 | 24.6±1.2 | 6.4±0.4 | 6.9±0.3 | 5.3±0.3 | 6.3±0.7 |
| Bg400-1 | 29.4±1.5 | 28.4±0.3 | 5.9±1.3 | 8.0±0.0 | 3.0±0.6 | 7.3±0.7 |
| Bg454 | 29.4±0.9 | 30.4±0.4 | 5.4±0.7 | 8.6±0.2 | 5.0±0.6 | 8.0±1.0 |
| Ld408 | 21.3±0.4 | 21.3±0.4 | 5.7±0.3 | 10.2±0.1 | 4.0±0.6 | 5.0±0.0 |
| H4 | 29.7±0.5 | 29.9±0.2 | 5.4±0.4 | 12.0±0.3 | 4.3±0.3 | 5.7±0.3 |
| Bg379-2 | 24.9±1.9 | 24.3±1.2 | 8.2±1.6 | 7.4±0.5 | 5.0±0.0 | 7.7±1.2 |
| Bw451 | 24.4±0.1 | 26.2±1.0 | 4.6±0.4 | 9.9±2.5 | 4.7±0.3 | 7.7±0.7 |
| LSD(α=0.05) | 0.61 | 0.67 | 0.27 | 0.21 | 0.22 | 0.29 |

**Fig. S1.**

**Supplementary Figures**

**Fig. S1.** Straw and seed (without husk) nitrogen (N), phosphorus (P), and potassium (K) concentrations of rice varieties differing in their time required for maturity (*i.e.,* short: <105 days, medium: 105-120 days, and long: >120 days), and yield potential (low and high) when grown under fertile field conditions. mean± SE., n=3 Note: upper case letters above the bars compares maturity classes while lower case letters compares yield categories within each maturity class. Different letters indicate statistically significant difference at α=0.05.

**Fig. S1.**

