**Supplementary files.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Trait** | ***MAS25*****(Mean ± S.E.)** | ***IB370*****(Mean ± S.E.)** | ***MAS25* × *IB370* F3 population (100 plants)** |
| **Range** | **Mean ± S.E.** |
| Plant height (cm) | 95.9 ± 0.55 | 99.6 ± 0.28 | 80-135 | 106 ± 0.97 |
| Effective number of tillers/plant | 10.4 ± 0.93 | 9 ± 0.62 | 8-24 | 14 ± 0.81 |
| Panicle length (cm) | 21.9 ± 0.47 | 19.1 ± 0.45 | 14.1-25.5 | 20 ± 0.51 |
| 1000-grain weight (g) | 21.1 ± 0.49 | 20.7 ± 0.50 | 10.2-26.8 | 21 ± 0.58 |
| Grain yield/plant (g) | 13.3 ± 0.72 | 10.2 ± 0.72 | 8.1-26.8 | 19 ± 0.82 |
| Grain length-breadth ratio | 4.2 ± 0.15 | 4.6 ± 0.13 | 3.2-5.4 | 4 ± 0.27 |

**Table S1:** Mean and range for physio-morphological traits of *MAS25* × *IB370* F3 population evaluated in the field under aerobic conditions.

|  |  |  |  |
| --- | --- | --- | --- |
| **Trait** | ***MAS25*****(Mean ± S.E.)** | ***IB370*****(Mean ± S.E.)** | ***MAS25* × *IB370* F4 population (100 plants)** |
| **Range** | **Mean ± S.E.** |
| Plant height (cm) | 94.8 ± 0.79 | 100.6 ± 0.40 | 82-130 | 101.9 ± 0.34 |
| Effective number of tillers/plant | 14.4 ± 0.21 | 12.4 ± 0.95 | 7-23 | 13.7 ± 0.05 |
| Panicle length (cm) | 21.2 ± 0.27 | 20.19 ± 0.14 | 17-29 | 21.8 ± 0.48 |
| 1000-grain weight (g) | 23.2 ± 0.63 | 19.0 ± 0.51 | 13.2-30.5 | 20.1 ± 0.65 |
| Grain yield/plant (g) | 14.6 ± 0.55 | 12.2 ± 0.84 | 8.4-31.6 | 15.6 ± 0.37 |
| Grain length-breadth ratio | 4.3 ± 0.22 | 4.7 ± 37 | 3.9-5.0 | 4.2 ± 0.22 |

**Table S2:** Mean and range for various physio-morphological traits of *MAS25* × *IB370* F4 population based on field evaluation under aerobic conditions.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Trait** | **Plant height****(cm)** | **Effective no of tillers/plant** | **Panicle length****(cm)** | **1000-grain weight****(g)** | **Grain yield/plant (g)** | **L/B ratio** |
| Plant height (cm) | 1 |  |  |  |  |  |
| Effective no. of tillers/plant | 0.618\*\* | 1 |  |  |  |  |
| Panicle length (cm) | 0.066 | 0.248\* | 1 |  |  |  |
| 1000-grain weight (g) | 0.458\*\* | 0.444\*\* | 0.401\*\* | 1 |  |  |
| Grain yield/plant (g) | 0.296\*\* | 0.316\*\* | 0.275\*\* | 0.277\*\* | 1 |  |
| L/B ratio | 0.365\*\* | 0.292\*\* | 0.045NS | 0.185 | -0.014 | 1 |

**Table S3:** Correlation coefficients among physio-morphological traits of *MAS25* × *IB370* F3 population grown under aerobic conditions in the field. \*Significant at 5%; \*\* Significant at 1% level; NS Non-Significant.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Trait** | **Plant height (cm)** | **Effective no. of tillers/plant** | **Panicle length****(cm)** | **1000-grain weight****(g)** | **Grain yield/plant****(g)** | **L/B ratio** |
| Plant height (cm) | 1 |  |  |  |  |  |
| Effective no. of tillers/plant | 0.397\*\* | 1 |  |  |  |  |
| Panicle length (cm) | 0.816\*\* | 0.446\*\* | 1 |  |  |  |
| 1000-grain weight (g) | 0.798\*\* | 0.407\*\* | 0.817\*\* | 1 |  |  |
| Grain yield/plant (g) | 0.159 | 0.418\*\* | 0.293\*\* | 0.119 | 1 |  |
| L/B ratio | 0.486\*\* | 0.186 | 0.415\*\* | 0.346\*\* | 0.027 | 1 |

**Table S4:** Correlation coefficients among physio-morphological traits of *MAS25* × *IB370* F4 population grown under aerobic conditions. \*Significant at 5%; \*\* Significant at 1% level.

|  |  |  |  |
| --- | --- | --- | --- |
| **Trait** | ***MAS25*****(Mean ± S.E.)** | ***IB370*****(Mean ± S.E.)** | ***MAS25* × *IB370* F3 plants (62 plants)** |
| **Range** | **Mean ± S.E.** |
| Plant height (cm) | 80.2 ± 0.90 | 91.0 ± 0.61 | 52-98 | 72 ± 0.50 |
| Effective no. of tillers/ plant | 5.6 ± 0.84 | 4.1 ± 0.52 | 2-8 | 4.6 ± 0.75 |
| Panicle length (cm) | 17.6 ± 0.48 | 16.0 ± 0.85 | 10.3-24.2 | 17.7 ± 0.82 |
| Grain yield/plant (g) | 5.4 ± 0.45 | 4.2 ± 0.56 | 0.2-5.7 | 1.6 ± 1.05 |
| 1000-grain weight (g) | 13.7 ± 0.21 | 12.6 ± 0.82 | 9.3-16.7 | 12.3 ± 0.44 |
| L/B ratio | 3.9 ± 0.11 | 4.0 ± 0.30 | 3.1-4.3 | 3.6 ± 0.15 |
| Root length (cm) | 40.3 ± 0.19 | 36.2 ± 0.80 | 34.5-57 | 43.8 ± 0.87 |
| Root thickness (mm) | 12.4 ± 0.68 | 11.8 ± 0.69 | 6.3-16.8 | 12.3 ± 0.74 |
| Fresh root weight (g) | 10.1 ± 0.47 | 8.11 ± 0.63 | 2.2-16.8 | 10.2 ± 0.18 |
| Dry root weight (g) | 2.6 ± 0.67 | 2.2 ± 0.47 | 0.9-7.5 | 3.2 ± 0.80 |

**Table S5:** Mean and range for various physio-morphological and root traits of *MAS25* × *IB370* F3 plants grown under water limited aerobic condition in the net house.

|  |  |  |  |
| --- | --- | --- | --- |
| **Trait** | ***MAS25*****(Mean ± S.E.)** | ***IB370*****(Mean ± S.E.)** | ***MAS25* × *IB370* F4 plants (14 plants)** |
| **Range** | **Mean ± S.E.** |
| Plant height (cm) | 85.1 ± 0.12 | 94.5 ± 0.31 | 83-105 | 95.2 ± 0.72 |
| Effective no. of tillers/plant | 8.1 ± 0.10 | 7.2 ± 0.87 | 5-10 | 6.9 ± 0.69 |
| Panicle length (cm) | 19.4 ± 0.65 | 16.5 ± 0.12 | 12.3-21.7 | 17.3 ± 0.67 |
| Grain yield/plant (g) | 7.6 ± 0.26 | 5.1 ± 0.21 | 1.1-6.8 | 3.3 ± 0.94 |
| 1000-grain weight (g) | 13.6 ± 0.13 | 13.5 ± 0.54 | 15.3-19.8 | 17.6 ± 0.36 |
| L/B ratio | 3.8 ± 0.21 | 4.1 ± 0.11 | 3.4-4.7 | 4.0 ± 0.17 |
| Root length (cm) | 43.9 ± 0.13 | 39.2 ± 0.30 | 38.5-57.8 | 46.1 ± 0.93 |
| Root thickness (mm) | 15.5 ± 0.98 | 13.1 ± 0.49 | 6.1-9.8 | 8.6 ± 0.36 |
| Fresh root weight (g) | 9.56 ± 0.34 | 7.0 ± 0.13 | 9.2-20.9 | 13.7 ± 0.88 |
| Dry root weight (g) | 2.1 ± 0.57 | 1.98 ± 0.24 | 1.7-5.3 | 3.6 ± 0.55 |

**Table S6:** Mean and range for various physio-morphological and root traits of *MAS25* × *IB370* F4 plants grown under water-limited aerobic conditions in the net house.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Trait** | **Plant height(cm)** | **Effective no. of tillers/ plant** | **Panicle length (cm)** | **1000-grain weight (g)** | **Grain yield/plant (g)** | **L/B ratio** | **Root length (cm)** | **Root thickness (mm)** | **Fresh root weight (g)** | **Dry root weight (g)** |
| **Plant height (cm)** | 1 |  |  |  |  |  |  |  |  |  |
| **Effective no. of tillers/plant** | 0.129 | 1 |  |  |  |  |  |  |  |  |
| **Panicle length (cm)** | -0.047 | 0.076 | 1 |  |  |  |  |  |  |  |
| **1000-grain weight (g)** | 0.12 | 0.260\* | 0.378\*\* | 1 |  |  |  |  |  |  |
| **Grain yield/plant (g)** | 0.250\* | 0.416\*\* | -0.051 | 0.036 | 1 |  |  |  |  |  |
| **L/B ratio** | 0.076 | 0.072 | -0.063 | -0.172 | 0.062 | 1 |  |  |  |  |
| **Root length (cm)** | 0.408\*\* | 0.317\* | -0.025 | 0.11 | 0.033 | 0.111 | 1 |  |  |  |
| **Root thickness (mm)** | -0.006 | -0.162 | -0.182 | -0.182 | -0.205 | -0.058 | -0.163 | 1 |  |  |
| **Fresh root weight (g)** | 0.432\*\* | 0.368\*\* | -0.088 | 0.141 | 0.174 | -0.116 | 0.435\*\* | 0.164 | 1 |  |
| **Dry root weight (g)** | 0.254\* | 0.168 | -0.092 | -0.078 | 0.102 | -0.03 | 0.361\*\* | 0.275\* | 0.613\*\* | 1 |

**Table S7:** Correlation coefficients among physio-morphological traits of *MAS25* × *IB370* F3 population under aerobic conditions in net house. \*Significant at 5%; \*\* Significant at 1% level.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Trait** | **Plant height (cm)** | **Effective no. of tillers/plant** | **Panicle length (cm)** | **1000-grain weight (g)** | **Grain yield/ plant (g)** | **L/B ratio** | **Root length (cm)** | **Root thickness (mm)** | **Fresh root weight (g)** | **Dry root weight (g)** |
| **Plant height (cm)** | 1 |   |   |   |   |   |   |   |   |   |
| **Effective no. of tillers/plant** | -0.156 | 1 |   |   |   |   |   |   |   |   |
| **Panicle length (cm)** | 0.138 | 0.368 | 1 |   |   |   |   |   |   |   |
| **1000-grain weight (g)** | 0.907\*\* | -0.203 | 0.289 | 1 |   |   |   |   |   |   |
| **Grain yield/plant (g)** | 0.903\*\* | -0.235 | 0.047 | 0.939\*\* | 1 |   |   |   |   |   |
| **L/B ratio** | 0.917\*\* | -0.228 | 0.048 | 0.939\*\* | 0.964\*\* | 1 |   |   |   |   |
| **Root length (cm)** | 0.578\* | -0.369 | 0.122 | 0.630\* | 0.619\* | 0.639\* | 1 |   |   |   |
| **Root thickness (mm)** | 0.945\*\* | -0.063 | 0.246 | 0.853\*\* | 0.826\*\* | 0.853\*\* | 0.581\* | 1 |   |   |
| **Fresh root weight (g)** | 0.926\*\* | -0.284 | 0.03 | 0.937\*\* | -0.264 | -0.086 | -0.139 | -0.16 | 1 |   |
| **Dry root weight (g)** | 0.943\*\* | -0.109 | 0.181 | 0.921\*\* | 0.946\*\* | 0.949\*\* | 0.639\* | 0.908\*\* | 0.938\*\* | 1 |

**Table S8:** Correlation coefficients among physio-morphological traits of MAS25 × IB370 F4 plants grown under aerobic conditions in net house. \*Significant at 5%; \*\* Significant at 1% level.



**Figure S1:** Mapped locations of 70 SSR markers on rice chromosomes covering the entire rice.



**Figure S2:** Frequency distribution curves for physio-morphological and root traits of *MAS25* x *IB370* F3 population grown under aerobic condition in the field (a-f) and net house (g & h).



**Figure S3:** Frequency distribution curves for physio-morphological and root traits of MAS25 x IB370 F4 populations grown under aerobic conditions in the field (a-f) and net house (g & h).