Table S1. Environment and traits evaluated in this study.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ICRISAT, India |  |  |  |  |  |  |  |  |  |  |  |
| Environment code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Environment \* | 2006 PRi | 2009 PRi | 2010 PRi | 2011 PRi | 2010 PR | 2011 PR | 2007 R | 2008 R | 2009 R | 2010 R | 2011 R |
| Traits measured\*\* | PL, PW | PL, PW | PL, PW | PL, PW | PL, PW | PL, PW | PL, PW | PL, PW | PL, PW | PL, PW | PL, PW |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Hainan, China |  |  |  |  |  |  |  |  |  |  |  |
| Environment code | 2017 | 2020 |  |  |  |  |  |  |  |  |  |
| Environment  | Nov-April | Nov-April |  |  |  |  |  |  |  |  |  |
| Traits measured | PC | PC, PR, PL, PW |  |  |  |  |  |  |  |  |  |

Notes: \*PRi-postrainy season with irrigation; PR-postrainy season; R-rainy season.

\*\*PC-panicle compactness; PL-panicle length; PR-peduncle recurving; PW-panicle width.

Table S2. Variance, heritability and normality for panicle length and width in the 11 testing environments.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Environment | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Panicle length |  |  |  |  |  |  |  |  |  |  |  |
| Variance | 6.90 | 29.90 | 43.37 | 49.54 | 49.55 | 39.29 | 29.70 | 31.66 | 40.91 | 52.14 | 54.28 |
| Broad-sense heritability | 0.27 | 0.88 | 0.94 | 0.94 | 0.95 | 0.90 | 0.71 | 0.77 | 0.93 | 0.97 | 0.94 |
| Shapiro-Wilk normality test (*P*) | <0.05 | 0.12 | 0.21 | <0.05 | 0.14 | <0.05 | <0.05 | <0.05 | <0.05 | 0.19 | <0.05 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Panicle width |  |  |  |  |  |  |  |  |  |  |  |
| Variance | 0.02 | 3.72 | 22.39 | 23.89 | 37.52 | 17.13 | 6.21 | 7.79 | 8.29 | 15.00 | 38.18 |
| Broad-sense heritability | 0 | 0.71 | 0.96 | 0.89 | 0.97 | 0.88 | 0.59 | 0.53 | 0.76 | 0.94 | 0.94 |
| Shapiro-Wilk normality test (*P*) | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |

Table S3. SNPs associated with panicle morphological traits in sorghum.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| QTL | Trait | Associating SNPs | -log(*P*) | Environment |
| *Pm 1-1* | PL, PW | 1:104311071:10464740 | 5.279.08 | 1010 |
| *Pm 1-2* | PW | 1:59803397 | 8.76 | 8 |
| *Pm 2-1* | PL, PW | 2:718947012:71894701 | 8.7210.38 | 1111 |
| *Pm 2-2* | PL, PW, PC | 2:731930402:732025312:73203231 | 7.959.919.20 | 49Hainan 2020 |
| *Pm 4-1* | PL/PW ratio | 4:8295990 | 8.79 | 2 |
| *Pm 6-1* | PL, PW | 6:324100396:32416278 | 6.649.16 | 83 |
| *Pm 6-2* | PL, PW | 6:483479336:48345655 | 6.958.02 | 59 |
| *Pr 7-1* | PR | 7:8196564 | 16.79 | Hainan 2020 |
| *Pm 8-1* | PL, PW | 8:533408468:53434526 | 5.728.87 | 510 |
| *Pr 9-1* | PR | 9:4123616 | 18.51 | Hainan 2020 |
| *Pm 10-1* | PL, PW | 10:1374514910:13775581 | 8.3910.37 | 99 |