**Supplementary Table 2** | Variance of general combining ability (GCA) and specific combining ability (SCA) and their interaction with the environment

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Traits | $$σ\_{E}^{2}$$ | $$σ\_{GCA\_{RIL}}^{2}$$ | $$σ\_{GCA\_{Tester}}^{2}$$ | $$σ\_{SCA}^{2}$$ | $$σ\_{GCA\_{RIL}\*E}^{2}$$ | $$σ\_{GCA\_{Tester}\*E}^{2}$$ | $$σ\_{SCA\*E}^{2}$$ | $$σ\_{ε}^{2}$$ | SCA/GCA |
| PH | 167.31  | 57.58  | 69.98  | 13.75  | 7.72  | 6.28  | 0.00  | 23.91  | 0.11 |
| EH | 78.21  | 28.85  | 79.11  | 5.73  | 2.77  | 0.24  | 0.00  | 16.77  | 0.05 |
| RNPE | 0.06  | 0.22  | 1.43  | 0.10  | 0.01  | 0.03  | 0.00  | 0.23  | 0.06 |
| KNPR | 4.50  | 1.75  | 0.72  | 1.02  | 0.68  | 0.25  | 0.00  | 3.51  | 0.41 |
| KT | 0.18  | 2.89  | 14.77  | 0.68  | 0.10  | 2.69  | 0.00  | 2.19  | 0.04 |
| KW | 1.32  | 4.78  | 0.03  | 1.76  | 0.29  | 0.22  | 0.00  | 5.76  | 0.37 |
| KL | 20.42  | 6.36  | 11.93  | 2.61  | 0.94  | 10.87  | 0.00  | 10.87  | 0.14 |
| VW | 2692.67  | 174.80  | 1.03  | 64.63  | 55.28  | 127.54  | 0.01  | 698.74  | 0.37 |
| HGW | 0.65  | 1.02  | 0.66  | 0.70  | 0.55  | 1.15  | 0.00  | 3.93  | 0.42 |
| GY | 16.62  | 16.93  | 10.29  | 21.09  | 15.60  | 26.01  | 0.16  | 146.02  | 0.77 |

SCA/GCA was calculated by $σ\_{SCA}^{2}$/($σ\_{GCA\_{RIL}}^{2}$+$σ\_{GCA\_{Tester}}^{2}$). $σ\_{E}^{2}$, environment variance; $σ\_{GCA\_{RIL}}^{2}$, variance of GCA of RIL; $σ\_{GCA\_{Tester}}^{2}$, variance of GCA of tester; $σ\_{SCA}^{2}$, variance of specific combining ability; $σ\_{GCA\_{RIL}\*E}^{2}$, $σ\_{GCA\_{Tester}\*E}^{2}$, $σ\_{SCA\*E}^{2}$ are the variance of the interactions between environment and GCA of RIL, GCA of tester, specific combining ability, respectively; $σ\_{ε}^{2}$, error variance. PH, plant height; EH, ear height; RNPE, row number per ear; KNPR, kernel number per row; KT, kernel thickness; KW, kernel width; KL, kernel length; VW, volume weight; HGW, hundred grain weight; GY, grain yield per plant.