**Supplementary Table 4 |** Variance components and proportion of the phenotypic variance contributed by each variance component in the recombinant inbred line population developed by Ye478 × Qi319 (RIL), Chang7-2 × RIL (TC), and Mo17 × RIL (TM) populations, respectively

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Population | Traits | $$σ\_{a}^{2}$$ | $$σ\_{aa}^{2}$$ | $$σ\_{ε}^{2}$$ | $$h\_{a}^{2}$$ | $$h\_{aa}^{2}$$ | $$h^{2}$$ |
| RIL | PH | 211.11  | 35.57  | 59.53  | 0.69  | 0.12  | 0.81  |
|  | EH | 66.64  | 12.04  | 27.73  | 0.63  | 0.11  | 0.74  |
|  | RNPE | 0.55  | 0.14  | 0.26  | 0.58  | 0.14  | 0.73  |
|  | KNPR | 4.06  | 1.84  | 6.01  | 0.34  | 0.15  | 0.50  |
|  | KT | 8.18  | 3.60  | 6.06  | 0.46  | 0.20  | 0.66  |
|  | KW | 11.90  | 3.60  | 6.58  | 0.54  | 0.16  | 0.70  |
|  | KL | 10.58  | 7.77  | 8.79  | 0.39  | 0.29  | 0.68  |
|  | VW | 285.21  | 224.63  | 648.60  | 0.25  | 0.19  | 0.44  |
|  | HGW | 4.86  | 1.77  | 3.07  | 0.50  | 0.18  | 0.68  |
|  | GY | 49.94  | 31.62  | 66.97  | 0.34  | 0.21  | 0.55  |
| TC | PH | 53.06  | 12.89  | 22.14  | 0.60  | 0.15  | 0.75  |
|  | EH | 32.33  | 5.43  | 10.52  | 0.67  | 0.11  | 0.78  |
|  | RNPE | 0.40  | 0.06  | 0.12  | 0.70  | 0.10  | 0.80  |
|  | KNPR | 1.27  | 0.52  | 1.17  | 0.43  | 0.17  | 0.60  |
|  | KT | 2.25  | 0.50  | 0.89  | 0.62  | 0.14  | 0.75  |
|  | KW | 6.09  | 1.35  | 2.57  | 0.61  | 0.13  | 0.74  |
|  | KL | 7.57  | 1.74  | 5.91  | 0.50  | 0.11  | 0.61  |
|  | VW | 156.13  | 103.25  | 248.62  | 0.31  | 0.20  | 0.51  |
|  | HGW | 1.84  | 0.68  | 1.10  | 0.51  | 0.19  | 0.70  |
|  | GY | 36.52  | 16.67  | 49.86  | 0.35  | 0.16  | 0.52  |
| TM | PH | 45.56  | 15.87  | 22.59  | 0.54  | 0.19  | 0.73  |
|  | EH | 38.37  | 5.45  | 9.26  | 0.72  | 0.10  | 0.83  |
|  | RNPE | 0.21  | 0.03  | 0.07  | 0.68  | 0.10  | 0.78  |
|  | KNPR | 2.87  | 0.96  | 1.61  | 0.53  | 0.18  | 0.70  |
|  | KT | 3.37  | 0.66  | 1.30  | 0.63  | 0.12  | 0.76  |
|  | KW | 5.34  | 1.17  | 2.25  | 0.61  | 0.13  | 0.74  |
|  | KL | 7.49  | 1.92  | 3.83  | 0.57  | 0.15  | 0.71  |
|  | VW | 170.47  | 76.95  | 195.46  | 0.38  | 0.17  | 0.56  |
|  | HGW | 1.92  | 0.58  | 1.08  | 0.54  | 0.16  | 0.70  |
| 　 | GY | 34.73  | 15.56  | 31.83  | 0.42  | 0.19  | 0.61  |

$h\_{a}^{2}$, the proportion of phenotypic variance contributed by additive variance (narrow-sense heritability), calculated by $h\_{a}^{2}=\frac{σ\_{a}^{2}}{(σ\_{a}^{2}+σ\_{aa}^{2}+σ\_{ε}^{2})}$;

$h\_{aa}^{2}$, the proportion of phenotypic variance contributed by additive-by-additive variance, calculated by $h\_{aa}^{2}=\frac{σ\_{aa}^{2}}{(σ\_{a}^{2}+σ\_{aa}^{2}+σ\_{ε}^{2})}$;

$h^{2}$, broad-sense heritability, calculatd by $h^{2}=\frac{σ\_{a}^{2}+σ\_{aa}^{2}}{(σ\_{a}^{2}+σ\_{aa}^{2}+σ\_{ε}^{2})}$.

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.