**Table 1. QTLs obtained using the three single models.**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Category | Traits | Trait ~ P. deltoides | | | Trait ~ P. nigra | | | Trait ~ Dosage | | |
| # of QTL | % explained by single QTL (µ ± 𝛔) | % explained by all QTLs | # of QTL | % explained by single QTL (µ ± 𝛔) | % explained by all QTLs | # of QTL | % explained by single QTL (µ ± 𝛔) | % explained by all QTLs |
| Biomass | Coppicing\_y1 | 1 | 4.6 ± 0 | 4.6 | 0 | NA | NA | 2 | 6.1 ± 1.6 | 7.0 |
| Diameter\_base | 0 | NA | NA | 0 | NA | NA | 1 | 3.4 ± 0 | 3.4 |
| Time\_serie\_diameter\_breast\_height | 0 | NA | NA | 0 | NA | NA | 4 | 3.7 ± 0.1 | 7.6 |
| Volume | 0 | NA | NA | 0 | NA | NA | 1 | 4.5 ± 0 | 4.5 |
| Leaf | Area\_y1\_y2 | 0 | NA | NA | 0 | NA | NA | 4 | 3.1 ± 0.2 | 9.8 |
| Circularity\_y1\_y2 | 0 | NA | NA | 0 | NA | NA | 3 | 4.4 ± 0.4 | 11.7 |
| Horizontal\_symmetry\_y1\_y2 | 0 | NA | NA | 0 | NA | NA | 1 | 10.8 ± 0 | 10.8 |
| Width\_y1\_y2 | 1 | 4.0 ± 0 | 4.0 | 1 | 4.2 ± 0 | 4.2 | 4 | 3.2 ± 0.3 | 10.0 |
| Indent\_depth\_y1\_y2 | 0 | NA | NA | 0 | NA | NA | 1 | 3.2 ± 0 | 3.2 |
| Indent\_width\_y1\_y2 | 0 | NA | NA | 0 | NA | NA | 1 | 4.8 ± 0 | 4.8 |
| Num\_Indents\_y1\_y2 | 0 | NA | NA | 0 | NA | NA | 6 | 3.9 ± 0.7 | 19.8 |
| PC1:PC2\_y1\_y2 | 0 | NA | NA | 1 | 4.1 ± 0 | 4.1 | 5 | 4.2 ± 0.1 | 10.7 |
| PC1:PC3\_y1\_y2 | 0 | NA | NA | 0 | NA | NA | 7 | 6.2 ± 0.9 | 23.7 |
| PC1:PC4\_y1\_y2 | 0 | NA | NA | 1 | 4.1 ± 0 | 4.1 | 4 | 4.6 ± 1.2 | 12.8 |
| PC1\_y1\_y2 | 0 | NA | NA | 0 | NA | NA | 8 | 5.6 ± 0.8 | 21.1 |
| PC3:PC4\_y1\_y2 | 1 | 4.3 ± 0 | 4.3 | 0 | NA | NA | 2 | 3.2 ± 0.1 | 6.6 |
| PC4\_y1\_y2 | 0 | NA | NA | 0 | NA | NA | 3 | 4.4 ± 0.9 | 13.4 |
| Perimeter\_y1\_y2 | 0 | NA | NA | 0 | NA | NA | 2 | 3.1 ± 0.1 | 6.4 |
| Perimeter2:Area2\_y1\_y2 | 1 | 4.0 | 4.0 | 0 | NA | NA | 0 | NA | NA |
| Length:width\_y1\_y2 | 1 | 4.7 ± 0 | 4.7 | 0 | NA | NA | 7 | 6.9 ± 0.6 | 19.3 |
| Length\_y1\_y2 | 0 | NA | NA | 0 | NA | NA | 1 | 3.5 ± 0 | 3.5 |
| Phenology | Bud\_burst\_y1\_y2 | 0 | NA | NA | 1 | 5.6 ± 0 | 5.6 | 2 | 6.1 ± 0.6 | 6.6 |
| Color\_y1\_y2\_y3 | 1 | 4.1 | 4.1 | 0 | NA | NA | 5 | 4.6 ± 0.4 | 14.2 |
| Drop\_y1\_y2\_y3 | 1 | 4.4 ± 0 | 4.4 | 0 | NA | NA | 2 | 5.9 ± 1.2 | 7.9 |
| Green\_canopy\_duration\_y1\_y2 | 0 | NA | NA | 0 | NA | NA | 2 | 4.9 ± 0.1 | 6.8 |
| Time\_serie\_bud\_burst\_y1\_y2 | 0 | NA | NA | 2 | 4.5 ± 0.8 | 7.2 | 2 | 8.6 ± 1.2 | 17.7 |
| Time\_serie\_color\_y1\_y2\_y3 | 1 | 3.8 ± 0 | 3.8 | 0 | NA | NA | 3 | 4.5 ± 0.5 | 9.7 |
| Time\_serie\_drop\_y1\_y2\_y3 | 1 | 4.8 | 4.8 | 0 | NA | NA | 3 | 5.2 ± 1.5 | 12.7 |