**Table S3.** The promising genes identified in multi-traits

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SNP | Gene ID | Homologue | Gene annotation | Traits |
| A01\_77149863, A01\_77149864,A01\_77149876, A01\_77149877,A05:81655281, A08:314\_10870, A08\_53492125, A10\_73015178, D13\_18028416.  | Gh\_A01G1284 | AT3G61260 | Remorin family protein | GRGI |
| Gh\_A01G1285 | AT3G61260 | Remorin family protein |
| Gh\_A08G0779 | [AT3G62310](https://www.arabidopsis.org/servlets/TairObject?type=locus&name=AT3G62310) | cilia- and flagella-associated protein 251-like  |
| Gh\_A08G0897 | [AT4G24060](https://www.arabidopsis.org/servlets/TairObject?type=locus&name=AT4G24060) | Dof-type zinc finger DNA-binding family protein |
| Gh\_A10G1372 | [AT3G58690](https://www.arabidopsis.org/servlets/TairObject?type=locus&name=AT3G58690) | Protein kinase superfamily protein |
| Gh\_D13G0891 | AT2G03830 | Root meristem growth factor  |
| Gh\_D13G0892 | [AT1G69030](https://www.arabidopsis.org/servlets/TairObject?type=locus&name=AT1G69030) | BSD domain-containing protein |
| A09\_68240653, A09:68255852, A09\_68257990, A09\_68258389.  | Gh\_A09G1504 | [AT3G09600](https://www.arabidopsis.org/servlets/TairObject?type=locus&name=AT3G09600) | Homeodomain-like superfamily protein | GRVI |
| Gh\_A09G1508 | [AT2G29480](https://www.arabidopsis.org/servlets/TairObject?type=locus&name=AT2G29480) | Glutathione S-transferase TAU 8 |
| Gh\_A09G1509 | [AT2G29420](https://www.arabidopsis.org/servlets/TairObject?type=locus&name=AT2G29420) | Glutathione S-transferase TAU 8 |
| Gh\_A09G1510 | [AT3G09270](https://www.arabidopsis.org/servlets/TairObject?type=locus&name=AT3G09270) | Glutathione S-transferase TAU 8 |
| Gh\_A09G1473 | [AT2G37540](https://www.arabidopsis.org/servlets/TairObject?type=locus&name=AT2G37540) | NAD(P)-binding Rossmann-fold superfamily protein |