**Table S2** Polymorphic sites used for the haplotypes of 20 soybean *COL* familygenes

|  |  |
| --- | --- |
| **Gene** | **Polymorphic sites of haplotypes** |
| ***GmCOL2*** | s378, Indel382, s385, s386, s387, Indel389, s400, s485, **s744**, Indel918, Indel919, Indel920, **s958**, **s1138**, **s1139**, **s1218**, **s1260**, Indel1336, Indel1337, Indel1419, s1425, s1428, s1433, Indel1447, s1477, s1492, s1501, s1513, s1560, s1611, s1625, s1687, s1746, s1776, s1781, s1796, Indel1822, s1877, s1896, s2147, s2301, s2440, Indel2473, Indel2567, **s3207**, s3302 |
| ***GmCOL4*** | **s644**, Indel787, Indel788, s822, s877, s1113, s1222, s1282, s1290, **s1566**, **s1954**, s2232, s2234, Indel2235, Indel2236, Indel2237, Indel2238, Indel2239, Indel2240, Indel2241, Indel2242, Indel2243, Indel2244, Indel2245, Indel2246, Indel2247, Indel2248, Indel2249, Indel2250, Indel2251, Indel2252, Indel2253, Indel2254, Indel2255, Indel2256, Indel2257, Indel2258, s2259, s2260, s2534, s2584, Indel2774, s2784, Indel2785, Indel2786, s2787, s2790, s2829, s2918, s2973, s3066, s3088, s3091, s3093, s3300, s3355, s3409, s3442, s3484, s3536, s3580, s3764, s3921, s3946, s4175, s4510, s4567, s4586, s4599, s4697, s4795, s5105, s5176, s5495, s5501, s5513, s5524, s5536, s5549, s5569, s5586, s5587, s5800, s5970, s6004, s6198, s6552, s6603, s6648, s6674, s6808, s6822, s7084, s7103, s7313, s7345, s7607, Indel7633, Indel7634, Indel7635, Indel7636, Indel7637, s7668, s7723, s7745, s7754, s7790, s7809, Indel8663, s9073, **s10932**, **s10984**, Indel11280, s11283, s11415, s11418, s11501, s11502, Indel11503, Indel11504, s11524 |
| ***GmCOL5*** | Indel394, Indel395, Indel396-410, s428, **s986**, **s999**, **s1052**, Indel1256, Indel1257, Indel1280, s1302, s1304, Indel1305, s1310, s1393, s1480, Indel1549, Indel1550, s1562, s1576, s1625, Indel1633-1651, Indel1652, Indel1653, Indel1654, Indel1655-1715, s-Indel1716, Indel1717-1767, s1768, Indel1769, Indel1770, Indel1771, Indel1772, Indel1773, Indel1774-1792, s-Indel1793, Indel1794-1837, s-Indel1838, s-Indel1839-2025, s2041, s2108, s2185, s2191, **s2352** |
| ***GmCOL6*** | s304, s348, Indel498, s499, s508, Indel511, **s924**, **s1005**, Indel1058, **s1065**, **s1083**, Indel1116, s1117, Indel1280, Indel1281, Indel1282, Indel1319-1378, **s1481**, **s1707**, s1791, s1834, Indel1968, Indel1969, Indel1070, s1979, s1996, Indel2045, Indel2046, s2083, s2345, **s2570**, s2571, Indel2377-2395, Indel2745, s2977, s2988, s3001 |
| ***GmCOL8*** | s458, **s714**, **s999**, s2698, s2856 |
| ***GmCOL9*** | **s791**, **s824**, **s905**, Indel1290, s1457, s1529, Indel1552, Indel1597, Indel1598, Indel1599, Indel1600, Indel1601, Indel1602, Indel1603, Indel2099, s2361, s2365, s2601, s2738, s3508, **s4186**, s4239, Indel4240, **s4654**, **s4960**, Indel5107, s5270, s5405, s5493, s5549 |
| ***GmCOL10*** | **s575**, **s1664**, **s1827**, Indel2215, Indel2216, Indel2217, Indel2218, s2413, Indel2566, Indel2567 |
| ***GmCOL13*** | **s584**, **s1946**, **s1989**, **s2049** |
| ***GmCOL14*** | Indel198, Indel645, Indel910, Indel1047, **s1134**, Indel1178, Indel1205, **s1538**, Indel1642, Indel1662, Indel1918, **s1921**, Indel2095, Indel2446, Indel2447, Indel2462, Indel2479, Indel2523, Indel2524 |
| ***GmCOL15*** | **s2910**, **s3278**, **s3867** |
| ***GmCOL16*** | s124, Indel130, **s525**, **s547**, **s590**, **s935**, **s1161**, s1574, s1623, s1700, Indel1810, Indel1811, s1888, s1948, s2167, Indel2184, Indel2196, Indel2197, s2221, s2250, s2405, s2651, s2773, s2785, s2825, s2909, s2931, Indel3297, Indel3298, Indel3299, Indel3300, Indel3301, Indel3302, Indel3303, Indel3304, s3920, **s4250**, **s4366**, **s4490**, Indel4572, Indel4573, s4719, s4752, s4773, s4854  |
| ***GmCOL19*** | **s491**, **s515**, **s910**, **s933**, s1719, s2568, s2570 |
| ***GmCOL20*** | s1310, **s1484**, s1605, s1662, s2093, Indel2448, Indel2449, Indel2450, s2455, s2492, s2526, **s2653**, **s2655**, **s2692**, s3066, s3149, s3197, s3201, s3247, s3361, s4250, s4303, s4362, s4363, s4401, **s4507**, Indel4897, Indel4898, Indel4899, Indel4900, Indel4901, Indel4902, Indel4903, Indel4904, Indel4905, Indel4906, Indel4907, Indel4908, Indel4909, **s4997**, **s5051** |
| ***GmCOL22*** | Indel534, **s760**, Indel841-848, Indel849-851, Indel852, s995, s1082, **s1183**, **s1198**, Indel1227, Indel1249, **s1268**, **s1417**, **s1434**, Indel1670-1675, s1681, Indel1690-1694, s1734, s1756, s1893, s2062, **s2201**, **s2441**, **s2451**, **s2495**, s2772, s2774, s2775, s2786, s2796, s2899, s2973, s2975  |
| ***GmCOL23*** | s429, Indel536, **s681**, s1019, **s1037**, Indel1071, Indel1072, Indel1073, Indel1074, Indel1075, Indel1076, **s1086**, **s1196**, **s1226**, Indel1858, **s1911**, s2116, s2137, s2146, Indel2153, Indel2159, s2169, Indel2264, s2277, Indel2301, s-Indel2302, s2395, Indel2472, s2511, **s2520**, Indel2823, s3017 |

**Note:** Red color means critical polymorphic sites of tagging haplotype**.**

**Table S2** Continued

|  |  |
| --- | --- |
| **Gene** | **Polymorphic sites of haplotypes** |
| ***GmCOL24*** | s250, s278, s374, Indel444, Indel480, Indel481, Indel482, s533, **s682**, **s706**, **s763**, **s813**, **s816**, **s872**, **s1058**, s1216, s1295, s1336, s1410, s1437, s1868, s1943, s2095, Indel2156  |
| ***GmCOL25*** | s659, s857, s928, **s1315**, **s1338**, Indel1344, Indel1345, Indel1346, Indel1347, Indel1348, Indel1349, Indel1350, Indel1351, Indel1352, Indel1353, **s1380**, **s1453**, **s1562**, **s1600**, **s1603**, **s1614**, **s1616**, **s1643**, s1702, s1704, s1775, s1870, s1909, s1913, s1960, s1984, Indel2030 |
| ***GmCOL26*** | s475, **s523**, **s573**, **s575**, **s615**, **s624**, **s625**, **s650**, **s663**, **s675**, **s679**, **s748**, **s783**, **s860**, **s881**, **s884**, **s885**, s1092, s1208, s1209, s1262, s1303, s1349, s1359  |
| ***GmCOL28*** | Indel330, s794, **s813, s1066**, Indel1281, Indel1282, Indel1283, Indel1284, s1725, s1812, s2055, s2784, s2786, Indel2788, Indel2789, s-Indel2790, s2881, Indel2928, s3122, s3294, s3380, s3416, Indel3451, s3477, s3759, s3773, Indel3811, s3883, Indel3983, Indel4003, s4016, Indel4043, Indel4199, s4207, s4292, s4537, s4575, Indel4598  |

**Note:** Red font means critical polymorphic sites of tagging haplotype**.**