Table S1: Weather data for 2013 and the average of 1981-2014 from Merelbeke/Lemberge (Belgium).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Average temperature (°C) | | Total rainfall (l m-2) | |
|  | 1981-2014 | 2013 | 1981-2014 | 2013 |
| January | 3.6 | 1.7 | 74 | 66 |
| February | 3.7 | 2.1 | 56 | 48 |
| March | 6.6 | 2.9 | 63 | 58 |
| April | 9.5 | 8.2 | 47 | 22 |
| May | 13.2 | 11.1 | 60 | 86 |
| June | 15.7 | 15.3 | 74 | 51 |
| July | 18.0 | 19.7 | 80 | 94 |
| August | 17.8 | 18.6 | 83 | 22 |
| September | 14.9 | 14.7 | 71 | 94 |
| October | 11.3 | 12.6 | 80 | 110 |
| November1 | 7.0 | 6.5 | 78 | 143 |
| December1 | 4.2 | 5.9 | 87 | 58 |

1 Average calculated for 1981-2013.

Table S2: Names, source and assigned cluster of the soybean genotypes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Genotype | Source | Cluster | Accession number NPGS/GRIN1 | Accession number IPK2 |
| Agate | genebank accession | 1 |  | SOJA 1376 |
| Dindone | genebank accession | 1 | PI 437177 | SOJA 1143 |
| Dindone 1 | genebank accession | 1 | PI 437178 | SOJA 1144 |
| Giessener | genebank accession | 1 | PI 361073 | SOJA 1502 |
| Gokuwase Hishima | genebank accession | 1 |  | SOJA 1519 |
| Hidatsa | genebank accession | 1 | PI 548341 | SOJA 1009 |
| Lithuania | genebank accession | 1 |  | SOJA 931 |
| Manitoba | genebank accession | 1 | PI 438365 | SOJA 1626 |
| Manitoba Brown | genebank accession | 1 | PI 548382 | SOJA 1551 |
| Miharu Daizu | genebank accession | 1 | PI 423864 | SOJA 1422 |
| Ochroleuca No. 2 | genebank accession | 1 | PI 189874 | SOJA 1571 |
| Ogemaw | genebank accession | 1 | PI 548395 | SOJA 1011 |
| Pravda | genebank accession | 1 | PI 442037 | SOJA 965 |
| Ronset 4 | genebank accession | 1 | PI 372423 | SOJA 1506 |
| Sango Waso | genebank accession | 1 | PI 205090 | SOJA 1592 |
| Shimshirazu No. 1 | genebank accession | 1 | PI 361111 | SOJA 1119 |
| Sioux | genebank accession | 1 | PI 548414 | SOJA 1552 |
| Soja brun hatif U 486 | genebank accession | 1 | PI 151249 | SOJA 1553 |
| Starachramiskaya | genebank accession | 1 | PI 189860 | SOJA 1470 |
| Ugra Soja | genebank accession | 1 | PI 198067 | SOJA 1591 |
| Vajva | genebank accession | 1 | PI 437188 | SOJA 1152 |
| Vilnensis | genebank accession | 1 | PI 189867 | SOJA 1030 |
| Wielnska Brunata | genebank accession | 1 | PI 290156 | SOJA 1491 |
| Zeja | genebank accession | 1 | PI 437085 | SOJA 1134 |
| - | genebank accession | 2 | PI 438156 |  |
| - | genebank accession | 2 | PI 438239 A |  |
| (Cha dou) | genebank accession | 2 | PI 603429 B |  |
| (GL 2669/90) | genebank accession | 2 | PI 567209 B |  |
| (Tai xin Black Bean) | genebank accession | 2 | PI 578482 C |  |
| Aan tu dang di hei dou | genebank accession | 2 | PI 578375 A |  |
| Chi Sha | genebank accession | 2 | PI 430491 | SOJA 1609 |
| DSS Juodon | genebank accession | 2 | PI 437183 | SOJA 1148 |
| Noir 1 | genebank accession | 2 | PI 290136 | SOJA 1679 |
| Noir 2 | genebank accession | 2 | PI 290137 |  |
| Noir des Freres Dippe | genebank accession | 2 | PI 189955 | SOJA 1682 |
| Noir Des Freres Dippeo | genebank accession | 2 | PI 189955 |  |
| Norddeutsche | genebank accession | 2 | PI 290138 |  |
| Oscar Dickmann | genebank accession | 2 | PI 189960 | SOJA 1681 |
| Pannonia 10 | genebank accession | 2 |  | SOJA 1005 |
| Pappelsdorf | genebank accession | 2 | PI 372419 |  |
| Roudnicka Black | genebank accession | 2 | PI 238925 | SOJA 1680 |
| Strengs Weihenstephaner | genebank accession | 2 | PI 445822 |  |
| Virginia | genebank accession | 2 | PI 417560 |  |
| - | genebank accession | 3 | PI 438148 |  |
| - | genebank accession | 3 | PI 438155 |  |
| - | genebank accession | 3 | PI 438158 B |  |
| - | genebank accession | 3 | PI 438208 |  |
| - | genebank accession | 3 | PI 438217 |  |
| - | genebank accession | 3 | PI 438265 |  |
| - | genebank accession | 3 | PI 358320 |  |
| - | genebank accession | 3 | PI 358321 A |  |
| - | genebank accession | 3 | PI 358321 B |  |
| - | genebank accession | 3 | PI 358322 |  |
| - | genebank accession | 3 | PI 378666 |  |
| - | genebank accession | 3 | PI 437754 |  |
| - | genebank accession | 3 | PI 437784 |  |
| - | genebank accession | 3 | PI 437996 B |  |
| - | genebank accession | 3 | PI 438014 |  |
| (Czy chua No. 1) | genebank accession | 3 | PI 297507 B |  |
| (Hei nong 29) | genebank accession | 3 | PI 518706 B |  |
| (Iregy soja) | genebank accession | 3 | PI 347544 B |  |
| (Man-tsan-tszin' x Phin-di-huan) | genebank accession | 3 | PI 437676 B |  |
| Balvansca | genebank accession | 3 | PI 438395 |  |
| Bao qing da bai mei | genebank accession | 3 | PI 603299 |  |
| Bel'skaja 25 | genebank accession | 3 | PI 476347 |  |
| Bora | genebank accession | 3 |  | SOJA 870 |
| Cha dou | genebank accession | 3 | PI 603429 A |  |
| Chico | genebank accession | 3 | PI 542402 |  |
| Chzi-hua N1 | genebank accession | 3 | PI 437582 |  |
| CM048 | genebank accession | 3 | PI 612740 |  |
| CSchi 672 | genebank accession | 3 | PI 437223 A |  |
| CSchi 676 | genebank accession | 3 | PI 437225 |  |
| Dieckmann Green | genebank accession | 3 | PI 153299 |  |
| Dieckmanns Helgelb | genebank accession | 3 | PI 189882 |  |
| Dnepropetrovsk 12 | genebank accession | 3 | PI 378658 |  |
| Donna | genebank accession | 3 |  | SOJA 872 |
| DV-0140 | genebank accession | 3 | PI 437100 |  |
| Falcon | genebank accession | 3 |  | SOJA 1686 |
| Feng shou No. 7 | genebank accession | 3 | PI 514671 |  |
| Grande | genebank accession | 3 | PI 548567 |  |
| Hartinskaja | genebank accession | 3 | PI 297513 |  |
| Iregszemcsei Szurkebarat | genebank accession | 3 | PI 232901 |  |
| J-29 | genebank accession | 3 | PI 153246 |  |
| J-35 | genebank accession | 3 | PI 153249 |  |
| Jihomeravska Zluta Drobnozna | genebank accession | 3 | PI 438368 | SOJA 961 |
| Jin shan pu | genebank accession | 3 | PI 578496 |  |
| Kawetanja | genebank accession | 3 |  | SOJA 865 |
| Kitti | genebank accession | 3 |  | SOJA 882 |
| Kong Fou Tseu | genebank accession | 3 | PI 153314 |  |
| L90P-3668-1 | genebank accession | 3 | PI 561242 |  |
| Mandarin 2 | genebank accession | 3 | PI 297532 |  |
| Man'gou | genebank accession | 3 | PI 437915 A |  |
| Mautner | genebank accession | 3 | PI 248403 |  |
| Minsoy | genebank accession | 3 | PI 548389 | SOJA 1010 |
| Nicogri | genebank accession | 3 | PI 437681 |  |
| Ooyachi 1 | genebank accession | 3 | PI 417227 | SOJA 1419 |
| Ruska Zluta | genebank accession | 3 | PI 442045 | SOJA 1676 |
| Shika No. 4 | genebank accession | 3 | PI 319536 A | SOJA 1403 |
| Soja-B 49/58 R | genebank accession | 3 | PI 257435 |  |
| Swift | genebank accession | 3 | PI 548500 |  |
| Titan | genebank accession | 3 | PI 608438 |  |
| Tszin'-juan'2 | genebank accession | 3 | PI 437735 |  |
| Tubinger | genebank accession | 3 | PI 445823 |  |
| Ussurijscaja 509 | genebank accession | 3 | PI 437413 |  |
| Ussurijscaja 518 | genebank accession | 3 | PI 437419 A |  |
| Veselovskaia 1 | genebank accession | 3 | PI 507706 |  |
| Zolta SWHN | genebank accession | 3 | PI 417524 | SOJA 1129 |
| (F59-244) | genebank accession | 4 | PI 347540 C |  |
| Alma Ata | variety | 4 |  |  |
| Altona | genebank accession | 4 | PI 548504 |  |
| Amphor | variety | 4 |  |  |
| Annushka | variety | 4 |  |  |
| Demetskaja VU 2261 | genebank accession | 4 | PI 437534 | SOJA 1620 |
| Dneprovskaja 12 | genebank accession | 4 | PI 437539 | SOJA 1621 |
| ES Mentor | variety | 4 |  |  |
| ES Senator | variety | 4 |  |  |
| Fiskeby V | genebank accession | 4 | PI 360955 A | SOJA 1375 |
| Gallec | variety | 4 |  |  |
| Gaterslebener St. 22 | genebank accession | 4 | PI 361072 |  |
| Geant Vert | genebank accession | 4 | PI 189963 | SOJA 1575 |
| Habarovskaja 4 | genebank accession | 4 |  | SOJA 1440 |
| Idefix | variety | 4 |  |  |
| Josefine | variety | 4 |  |  |
| Kamishunbetzu | genebank accession | 4 | PI 360958 | SOJA 1603 |
| Kent | variety | 4 |  |  |
| Kiev | genebank accession | 4 |  | SOJA 1697 |
| Kromerizka Zluta | genebank accession | 4 | PI 438369 A | SOJA 1627 |
| Leman | genebank accession | 4 |  | SOJA 887 |
| Lissabon | variety | 4 |  |  |
| Lotus | variety | 4 |  |  |
| Maple Amber | genebank accession | 4 |  | SOJA 1683 |
| Maple Arrow | genebank accession | 4 | PI 548593 | SOJA 1332 |
| Maple Ridge | genebank accession | 4 | PI 548596 | SOJA 1739 |
| Mercedes | genebank accession | 4 |  | SOJA 877 |
| Merlin | variety | 4 |  |  |
| Moldavskaja 65 | genebank accession | 4 | PI 437271 | SOJA 1166 |
| Naya | variety | 4 |  |  |
| ND1005T | variety | 4 |  |  |
| Nordic No. 5 | genebank accession | 4 |  | SOJA 1343 |
| Polan | genebank accession | 4 |  | SOJA 1730 |
| Pollux | variety | 4 |  |  |
| Pripyat | variety | 4 |  |  |
| Progres | genebank accession | 4 |  | SOJA 1711 |
| Rouest 4 | genebank accession | 4 | PI 438415 | SOJA 1634 |
| Shinsel | genebank accession | 4 | PI 360963 A | SOJA 1497 |
| Sito | genebank accession | 4 |  | SOJA 1782 |
| Skorospelaja 8 | genebank accession | 4 | PI 438382 | SOJA 1631 |
| Sojara | breeding line | 4 |  |  |
| Toliman | variety | 4 |  |  |
| Toma | variety | 4 |  |  |
| Traill | variety | 4 |  |  |
| Tundra | variety | 4 |  |  |
| Venus | variety | 4 |  |  |
| Veras | variety | 4 |  |  |
| Yaselda | variety | 4 |  |  |
| - | genebank accession | 5 | PI 438160 B |  |
| (Harbinskaia 3871) | genebank accession | 5 | PI 361077 B |  |
| Ajma | genebank accession | 5 |  | SOJA 1685 |
| Balvanska | genebank accession | 5 | PI 290150 | SOJA 1490 |
| Baron | genebank accession | 5 |  | SOJA 1783 |
| Bulduri | genebank accession | 5 | PI 437176 | SOJA 1142 |
| Bydgoska 071 | genebank accession | 5 | PI 423708 A |  |
| Caloria | genebank accession | 5 | PI 372403 A | SOJA 1504 |
| Cervin | genebank accession | 5 |  | SOJA 874 |
| Charbarovskaja 23 | genebank accession | 5 |  | SOJA 1351 |
| Chirovogradskaja 2 | genebank accession | 5 | PI 437532 | SOJA 1177 |
| Christine | variety | 5 |  |  |
| Czarna SWHN | genebank accession | 5 | PI 423711 | SOJA 1512 |
| Dieckmann | genebank accession | 5 | PI 372406 | SOJA 1121 |
| Dorado | genebank accession | 5 |  | SOJA 859 |
| Dorena | genebank accession | 5 |  | SOJA 881 |
| Dornburger Weißblühende | genebank accession | 5 |  | SOJA 1921 |
| Drebna Ungarska | genebank accession | 5 | PI 378662 | SOJA 1507 |
| Effi | genebank accession | 5 |  | SOJA 863 |
| ES Capnor | variety | 5 |  |  |
| Giesenska Early Yellow | genebank accession | 5 | PI 238923 | SOJA 1596 |
| Gieso | genebank accession | 5 |  | SOJA 871 |
| Grignon 37 | genebank accession | 5 | PI 153304 |  |
| Gunczdzulin | genebank accession | 5 |  | SOJA 1521 |
| Heimkraft II | genebank accession | 5 | PI 290153 | SOJA 1106 |
| HU12.S703-072 | breeding line | 5 |  |  |
| Iregi Soja | genebank accession | 5 | PI 347544 A | SOJA 1494 |
| Iskra | genebank accession | 5 |  | SOJA 1691 |
| Jaune de Desme | genebank accession | 5 | PI 438464 | SOJA 1648 |
| Kirowogradskaja 5 | genebank accession | 5 |  | SOJA 1695 |
| Klaxon | variety | 5 |  |  |
| Kong Fou Tsen | genebank accession | 5 | PI 153314 | SOJA 1459 |
| La po wu | genebank accession | 5 | PI 504497 |  |
| Louidor | genebank accession | 5 |  | SOJA 861 |
| Maple Presto | genebank accession | 5 | PI 548594 | SOJA 1434 |
| Mauthner Drobnozrna | genebank accession | 5 | PI 361086 | SOJA 924 |
| Murzynka | genebank accession | 5 | PI 438452 | SOJA 1640 |
| Nen Tszjan Da Doau | genebank accession | 5 | PI 437680 A | SOJA 1181 |
| No. 155/49 | genebank accession | 5 | PI 232999 |  |
| Pavlikeni 502 | genebank accession | 5 | PI 438353 | SOJA 1191 |
| Rouest 71 | genebank accession | 5 | PI 189897 |  |
| Saljut 216 | genebank accession | 5 | PI 295952 | SOJA 1109 |
| Saljut I | genebank accession | 5 | PI 361108 | SOJA 1117 |
| Silvia | genebank accession | 5 |  | SOJA 1737 |
| Skorospelka 3 | genebank accession | 5 | PI 437273 A | SOJA 1615 |
| Skorospelka Ulutsemnaja | genebank accession | 5 | PI 437274 | SOJA 1168 |
| Strain No. 14 | genebank accession | 5 | PI 180499 |  |
| Tadshikskaja 31 | genebank accession | 5 |  | SOJA 1544 |
| Trzic Rana | genebank accession | 5 | PI 361114 | SOJA 1120 |
| Wolfsthaler | genebank accession | 5 | PI 438393 | SOJA 1632 |
| Zarja | genebank accession | 5 | PI 378681 | SOJA 952 |
| Zlotka | genebank accession | 5 | PI 438454 | SOJA 1642 |
| Acme | genebank accession | 6 | PI 548498 | SOJA 1013 |
| Ashtabula | variety | 6 |  |  |
| Aveline | variety | 6 |  |  |
| Beda | genebank accession | 6 |  | SOJA 883 |
| C 14/58 | genebank accession | 6 | PI 257432 |  |
| Cardiff | variety | 6 |  |  |
| Cordoba | variety | 6 |  |  |
| Crest | genebank accession | 6 | PI 548544 | SOJA 1015 |
| Daksoy | genebank accession | 6 | PI 602896 |  |
| Dawson | genebank accession | 6 | PI 542403 |  |
| Diamant | genebank accession | 6 |  | SOJA 1778 |
| Dieckmanns Fruhegelb | genebank accession | 6 | PI 189883 |  |
| ES Cridor | variety | 6 |  |  |
| Essor | variety | 6 |  |  |
| Evans | genebank accession | 6 | PI 548560 |  |
| Flavia | variety | 6 |  |  |
| Gang 81-128-1 | genebank accession | 6 | PI 597426 |  |
| GL Hermine | variety | 6 |  |  |
| HU12.S703-027 | breeding line | 6 |  |  |
| HU12.S703-028 | breeding line | 6 |  |  |
| HU12.S703-040 | breeding line | 6 |  |  |
| HU12.S703-052 | breeding line | 6 |  |  |
| HU12.S703-065 | breeding line | 6 |  |  |
| HU12.S703-076 | breeding line | 6 |  |  |
| HU12.S703-081 | breeding line | 6 |  |  |
| HU12.S703-084 | breeding line | 6 |  |  |
| HU12.S703-087 | breeding line | 6 |  |  |
| HU12.S703-093 | breeding line | 6 |  |  |
| HU12.S703-101 | breeding line | 6 |  |  |
| HU12.S703-127 | breeding line | 6 |  |  |
| HU12.S703-145 | breeding line | 6 |  |  |
| HU12.S703-160 | breeding line | 6 |  |  |
| HU12.S703-167 | breeding line | 6 |  |  |
| HU12.S703-179 | breeding line | 6 |  |  |
| HU12.S703-181 | breeding line | 6 |  |  |
| HU12.S703-182 | breeding line | 6 |  |  |
| HU12.S703-222 | breeding line | 6 |  |  |
| Kairyo No. 1 | genebank accession | 6 | PI 227323 | SOJA 1393 |
| Kalmit | genebank accession | 6 |  | SOJA 864 |
| Kamianetz | genebank accession | 6 | PI 189875 | SOJA 1032 |
| Katana | variety | 6 |  |  |
| Ke-Shuan | genebank accession | 6 | PI 297524 | SOJA 1110 |
| Malaga | variety | 6 |  |  |
| Mauthner Universal | genebank accession | 6 | PI 372417 |  |
| McCall | genebank accession | 6 | PI 548582 |  |
| MN0301 | genebank accession | 6 | PI 602594 |  |
| Padua | variety | 6 |  |  |
| Pagoda | genebank accession | 6 | PI 548398 | SOJA 1012 |
| Protéix | variety | 6 |  |  |
| Pulawska Wczesna | genebank accession | 6 | PI 423715 | SOJA 1084 |
| Reatz | genebank accession | 6 | PI 290143 | SOJA 1489 |
| Record North | genebank accession | 6 | PI 295951 | SOJA 1108 |
| Rekord Severna | genebank accession | 6 |  | SOJA 966 |
| Ros | variety | 6 |  |  |
| Sansindunskaja | genebank accession | 6 | PI 437920 A | SOJA 1624 |
| Sargent | genebank accession | 6 | PI 615585 |  |
| Sava | genebank accession | 6 |  | SOJA 1741 |
| Sheyenne | variety | 6 |  |  |
| Soja-C.-St. 1/58 | genebank accession | 6 | PI 257428 |  |
| Tokio | genebank accession | 6 | PI 438285 | SOJA 1186 |
| Ussurijscaja 432 | genebank accession | 6 | PI 437380 |  |
| Vinca | genebank accession | 6 | PI 290155 | SOJA 1080 |
| Zolta z Zolna | genebank accession | 6 | PI 423719 | SOJA 1514 |
| - | genebank accession | 7 | PI 438264 |  |
| - | genebank accession | 7 | PI 438267 |  |
| - | genebank accession | 7 | PI 407386 A |  |
| (Hong feng No. 3) | genebank accession | 7 | PI 549076 B |  |
| (K-002) | genebank accession | 7 | PI 567212 B |  |
| Ada | genebank accession | 7 | PI 548499 | SOJA 1014 |
| Agassiz | genebank accession | 7 | PI 562372 |  |
| Apache | genebank accession | 7 |  | SOJA 1786 |
| Atlas | genebank accession | 7 |  | SOJA 1777 |
| Beiliang No. 11 | genebank accession | 7 | PI 479716 |  |
| Birka | genebank accession | 7 |  | SOJA 888 |
| C 8/58 R | genebank accession | 7 | PI 257436 |  |
| CSchi 1087 | genebank accession | 7 | PI 437246 A |  |
| Dal'nevostocnaja 913 | genebank accession | 7 | PI 437140 | SOJA 1139 |
| Dong Nong 37 | genebank accession | 7 | PI 503336 |  |
| Feng shou 19 | genebank accession | 7 | PI 518702 |  |
| Glenwood | genebank accession | 7 | PI 513382 |  |
| Grant | genebank accession | 7 | PI 548568 |  |
| Halton | genebank accession | 7 | PI 189906 | SOJA 1035 |
| Harbin 94-2508 | genebank accession | 7 | PI 612717 |  |
| He feng 93-111 | genebank accession | 7 | PI 612712 |  |
| He jiao No. 8 | genebank accession | 7 | PI 578432 A |  |
| Heh Ho 3 | genebank accession | 7 | PI 436613 | SOJA 1132 |
| Hei nong 30 | genebank accession | 7 | PI 592962 A |  |
| Hei nung No. 10 | genebank accession | 7 | PI 391588 |  |
| HU12.S703-159 | breeding line | 7 |  |  |
| Jilin 8978-6 | genebank accession | 7 | PI 612728 |  |
| K 93-600 | genebank accession | 7 | PI 612710 |  |
| Ken nong No. 7 | genebank accession | 7 | PI 593944 |  |
| Krasnodar 391-89 | genebank accession | 7 | PI 597403 A |  |
| Kubanskaja 19 | genebank accession | 7 | PI 512323 |  |
| Lambert | genebank accession | 7 | PI 562373 |  |
| Mandchourie | genebank accession | 7 | PI 189878 | SOJA 1471 |
| Miao King Huang | genebank accession | 7 | PI 297540 | SOJA 1081 |
| MN0302 | genebank accession | 7 | PI 629005 |  |
| MN0901 | genebank accession | 7 | PI 612764 |  |
| MN1302 | genebank accession | 7 | PI 616498 |  |
| Morsoy | genebank accession | 7 | PI 548600 | SOJA 1016 |
| Okuhara Early | genebank accession | 7 |  | SOJA 1518 |
| Opaline | variety | 7 |  |  |
| Ozzie | genebank accession | 7 | PI 542404 |  |
| Primorskaja 71 | genebank accession | 7 | PI 437147 | SOJA 1141 |
| Proto | genebank accession | 7 | PI 542769 |  |
| Ratarka | genebank accession | 7 |  | SOJA 1744 |
| Ronda | genebank accession | 7 |  | SOJA 886 |
| Saljut | genebank accession | 7 | PI 361107 | SOJA 1116 |
| Satyna | variety | 7 |  |  |
| Simpson | genebank accession | 7 | PI 548615 | SOJA 1776 |
| Soja 74/60 Dormburger st | genebank accession | 7 | PI 417548 |  |
| Toshidai 7910 | genebank accession | 7 |  | SOJA 1520 |
| Toyopro | genebank accession | 7 | PI 592560 |  |
| Traverse | genebank accession | 7 | PI 548621 |  |
| Vitiaz' 50 | genebank accession | 7 | PI 567217 A |  |
| Walsh | genebank accession | 7 | PI 615586 |  |
| Zlotka | genebank accession | 7 | PI 258383 |  |

1 National Plant Germplasm System, Baltimore, USA, http://www.ars-grin.gov/

2 Leibniz-Institut für Pflanzengenetik und Kulturpflanzenforschung, Gatersleben, Germany, http://www.ipk-gatersleben.de/