

Table S1. Geographical distribution of 292 soybean germplasm resources.

| Variety number | Nation | Regional origin | Latitude | longitude |
|----------------|--------|-----------------------|-------------|-------------|
| K001 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K002 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K003 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K004 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K005 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K006 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K007 | China | Jilin Province | 43.81825279 | 125.3684218 |
| K008 | China | Jilin Province | 43.81825279 | 125.3684218 |
| K009 | China | Jilin Province | 43.81825279 | 125.3684218 |
| K010 | China | Jilin Province | 43.81825279 | 125.3684218 |
| K011 | China | Jilin Province | 43.81825279 | 125.3684218 |
| K012 | China | Jilin Province | 43.81825279 | 125.3684218 |
| K013 | China | Hebei Province | 38.82823957 | 115.4407085 |
| K014 | China | Hebei Province | 38.82823957 | 115.4407085 |
| K015 | China | Hebei Province | 38.82823957 | 115.4407085 |
| K016 | China | Hebei Province | 38.82823957 | 115.4407085 |
| K017 | China | Hebei Province | 38.82823957 | 115.4407085 |
| K018 | China | Hebei Province | 38.82823957 | 115.4407085 |
| K019 | China | Hebei Province | 38.82823957 | 115.4407085 |
| K020 | China | Hebei Province | 38.82823957 | 115.4407085 |
| K021 | China | Hebei Province | 38.82823957 | 115.4407085 |
| K022 | China | Hebei Province | 38.82823957 | 115.4407085 |
| K023 | China | Hebei Province | 38.82823957 | 115.4407085 |
| K024 | China | Hebei Province | 38.82823957 | 115.4407085 |
| K025 | China | Hebei Province | 38.82823957 | 115.4407085 |
| K026 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K027 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K028 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K029 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K030 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K031 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K032 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K033 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K034 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K035 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K036 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K037 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K038 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K039 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K040 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K041 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |

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|------|-------|-----------------------|-------------|-------------|
| K042 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K043 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K044 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K045 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K046 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K047 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K048 | China | Sichuan Province | 29.98021343 | 102.993805 |
| K049 | China | Sichuan Province | 29.98021343 | 102.993805 |
| K050 | China | Sichuan Province | 29.98021343 | 102.993805 |
| K051 | China | Sichuan Province | 29.98021343 | 102.993805 |
| K052 | China | Sichuan Province | 29.98021343 | 102.993805 |
| K053 | China | Sichuan Province | 29.98021343 | 102.993805 |
| K054 | China | Sichuan Province | 29.98021343 | 102.993805 |
| K055 | China | Inner Mongolia | 40.80697153 | 111.6998279 |
| K056 | China | Inner Mongolia | 40.80697153 | 111.6998279 |
| K057 | China | Inner Mongolia | 40.80697153 | 111.6998279 |
| K058 | China | Inner Mongolia | 40.80697153 | 111.6998279 |
| K059 | China | Inner Mongolia | 40.80697153 | 111.6998279 |
| K060 | China | Inner Mongolia | 40.80697153 | 111.6998279 |
| K061 | China | Inner Mongolia | 40.80697153 | 111.6998279 |
| K062 | China | Inner Mongolia | 40.80697153 | 111.6998279 |
| K063 | China | Inner Mongolia | 40.80697153 | 111.6998279 |
| K064 | China | Inner Mongolia | 40.80697153 | 111.6998279 |
| K065 | China | Inner Mongolia | 40.80697153 | 111.6998279 |
| K066 | China | Inner Mongolia | 40.80697153 | 111.6998279 |
| K067 | China | Inner Mongolia | 40.80697153 | 111.6998279 |
| K068 | China | Inner Mongolia | 40.80697153 | 111.6998279 |
| K069 | Italy | macerata | 43.2994 | 13.4567 |
| K070 | Italy | macerata | 43.2994 | 13.4567 |
| K071 | Italy | macerata | 43.2994 | 13.4567 |
| K072 | Italy | macerata | 43.2994 | 13.4567 |
| K073 | Italy | macerata | 43.2994 | 13.4567 |
| K074 | Italy | macerata | 43.2994 | 13.4567 |
| K075 | Italy | macerata | 43.2994 | 13.4567 |
| K076 | Italy | macerata | 43.2994 | 13.4567 |
| K077 | Italy | macerata | 43.2994 | 13.4567 |
| K078 | Italy | macerata | 43.2994 | 13.4567 |
| K079 | Italy | macerata | 43.2994 | 13.4567 |
| K080 | Japan | Hokkaido | 43.2203 | 142.8637 |
| K081 | Japan | Hokkaido | 43.2203 | 142.8637 |
| K082 | Japan | Hokkaido | 43.2203 | 142.8637 |
| K083 | Japan | Hokkaido | 43.2203 | 142.8637 |
| K084 | Japan | Hokkaido | 43.2203 | 142.8637 |
| K085 | Japan | Hokkaido | 43.2203 | 142.8637 |

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|------|---------------|-------------------|-------------|-------------|
| K086 | Japan | Hokkaido | 43.2203 | 142.8637 |
| K087 | United States | Ithaca, New York | 42.443961 | 76.501881 |
| K088 | United States | Ithaca, New York | 42.443961 | 76.501881 |
| K089 | United States | Ithaca, New York | 42.443961 | 76.501881 |
| K090 | United States | Ithaca, New York | 42.443961 | 76.501881 |
| K091 | United States | Ithaca, New York | 42.443961 | 76.501881 |
| K092 | United States | Ithaca, New York | 42.443961 | 76.501881 |
| K093 | United States | Ithaca, New York | 42.443961 | 76.501881 |
| K094 | United States | Ithaca, New York | 42.443961 | 76.501881 |
| K095 | United States | Ithaca, New York | 42.443961 | 76.501881 |
| K096 | United States | Ithaca, New York | 42.443961 | 76.501881 |
| K097 | United States | Ithaca, New York | 42.443961 | 76.501881 |
| K098 | Canada | saskatchewan | 54.0484 | 106.4088 |
| K099 | Canada | saskatchewan | 54.0484 | 106.4088 |
| K100 | Canada | saskatchewan | 54.0484 | 106.4088 |
| K101 | Canada | saskatchewan | 54.0484 | 106.4088 |
| K102 | Canada | saskatchewan | 54.0484 | 106.4088 |
| K103 | Canada | saskatchewan | 54.0484 | 106.4088 |
| K104 | Canada | saskatchewan | 54.0484 | 106.4088 |
| K105 | Canada | saskatchewan | 54.0484 | 106.4088 |
| K106 | Canada | saskatchewan | 54.0484 | 106.4088 |
| K107 | Canada | saskatchewan | 54.0484 | 106.4088 |
| K108 | Canada | saskatchewan | 54.0484 | 106.4088 |
| K109 | Canada | saskatchewan | 54.0484 | 106.4088 |
| K110 | Canada | saskatchewan | 54.0484 | 106.4088 |
| K111 | Canada | saskatchewan | 54.0484 | 106.4088 |
| K112 | Germany | Bonn | 50.7374 | 7.0982 |
| K113 | Germany | Bonn | 50.7374 | 7.0982 |
| K114 | Germany | Bonn | 50.7374 | 7.0982 |
| K115 | Germany | Bonn | 50.7374 | 7.0982 |
| K116 | Germany | Bonn | 50.7374 | 7.0982 |
| K117 | Germany | Bonn | 50.7374 | 7.0982 |
| K118 | Germany | Bonn | 50.7374 | 7.0982 |
| K119 | China | Henan Province | 34.78592456 | 113.6580041 |
| K120 | China | Henan Province | 34.78592456 | 113.6580041 |
| K121 | China | Henan Province | 34.78592456 | 113.6580041 |
| K122 | China | Henan Province | 34.78592456 | 113.6580041 |
| K123 | China | Henan Province | 34.78592456 | 113.6580041 |
| K124 | China | Henan Province | 34.78592456 | 113.6580041 |
| K125 | China | Shandong Province | 36.1640405 | 117.1481468 |
| K126 | China | Shandong Province | 36.1640405 | 117.1481468 |
| K127 | China | Shandong Province | 36.1640405 | 117.1481468 |
| K128 | China | Shandong Province | 36.1640405 | 117.1481468 |
| K129 | China | Shandong Province | 36.1640405 | 117.1481468 |

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|------|-------|-------------------|-------------|-------------|
| K130 | China | Shandong Province | 36.1640405 | 117.1481468 |
| K131 | China | Shandong Province | 36.1640405 | 117.1481468 |
| K132 | China | Shandong Province | 36.1640405 | 117.1481468 |
| K133 | China | Shandong Province | 36.1640405 | 117.1481468 |
| K134 | China | Shandong Province | 36.1640405 | 117.1481468 |
| K135 | China | Shanxi Province | 37.42359063 | 112.5812384 |
| K136 | China | Shanxi Province | 37.42359063 | 112.5812384 |
| K137 | China | Shanxi Province | 37.42359063 | 112.5812384 |
| K138 | China | Shanxi Province | 37.42359063 | 112.5812384 |
| K139 | China | Shanxi Province | 37.42359063 | 112.5812384 |
| K140 | China | Shanxi Province | 37.42359063 | 112.5812384 |
| K141 | China | Shanxi Province | 37.42359063 | 112.5812384 |
| K142 | China | Shanxi Province | 37.42359063 | 112.5812384 |
| K143 | China | Hebei Province | 38.82823957 | 115.4407085 |
| K144 | China | Hebei Province | 38.82823957 | 115.4407085 |
| K145 | China | Hebei Province | 38.82823957 | 115.4407085 |
| K146 | China | Hebei Province | 38.82823957 | 115.4407085 |
| K147 | China | Hebei Province | 38.82823957 | 115.4407085 |
| K148 | China | Shanxi Province | 37.42359063 | 112.5812384 |
| K149 | China | Shanxi Province | 37.42359063 | 112.5812384 |
| K150 | China | Shanxi Province | 37.42359063 | 112.5812384 |
| K151 | China | Shanxi Province | 37.42359063 | 112.5812384 |
| K152 | China | Shanxi Province | 37.42359063 | 112.5812384 |
| K153 | China | Jiangsu Province | 32.03559022 | 118.8345915 |
| K154 | China | Jiangsu Province | 32.03559022 | 118.8345915 |
| K155 | China | Jiangsu Province | 32.03559022 | 118.8345915 |
| K156 | China | Jiangsu Province | 32.03559022 | 118.8345915 |
| K157 | China | Jiangsu Province | 32.03559022 | 118.8345915 |
| K158 | China | Jiangsu Province | 32.03559022 | 118.8345915 |
| K159 | China | Jiangsu Province | 32.03559022 | 118.8345915 |
| K160 | China | Jiangsu Province | 32.03559022 | 118.8345915 |
| K161 | China | Zhejiang Province | 30.23630946 | 119.7246135 |
| K162 | China | Zhejiang Province | 30.23630946 | 119.7246135 |
| K163 | China | Zhejiang Province | 30.23630946 | 119.7246135 |
| K164 | China | Zhejiang Province | 30.23630946 | 119.7246135 |
| K165 | China | Zhejiang Province | 30.23630946 | 119.7246135 |
| K166 | China | Liaoning Province | 41.89951289 | 123.4426912 |
| K167 | China | Liaoning Province | 41.89951289 | 123.4426912 |
| K168 | China | Liaoning Province | 41.89951289 | 123.4426912 |
| K169 | China | Liaoning Province | 41.89951289 | 123.4426912 |
| K170 | China | Liaoning Province | 41.89951289 | 123.4426912 |
| K171 | China | Liaoning Province | 41.89951289 | 123.4426912 |
| K172 | China | Hunan Province | 28.18544128 | 113.0829241 |
| K173 | China | Hunan Province | 28.18544128 | 113.0829241 |

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| K174 | China | Hunan Province | 28.18544128 | 113.0829241 |
| K175 | China | Hunan Province | 28.18544128 | 113.0829241 |
| K176 | China | Hunan Province | 28.18544128 | 113.0829241 |
| K177 | China | Hunan Province | 28.18544128 | 113.0829241 |
| K178 | China | Hunan Province | 28.18544128 | 113.0829241 |
| K179 | China | Hubei Province | 30.47673299 | 114.3505136 |
| K180 | China | Hubei Province | 30.47673299 | 114.3505136 |
| K181 | China | Hubei Province | 30.47673299 | 114.3505136 |
| K182 | China | Hubei Province | 30.47673299 | 114.3505136 |
| K183 | China | Hubei Province | 30.47673299 | 114.3505136 |
| K184 | China | Hubei Province | 30.47673299 | 114.3505136 |
| K185 | China | Yunnan Province | 25.13180014 | 102.7481603 |
| K186 | China | Yunnan Province | 25.13180014 | 102.7481603 |
| K187 | China | Yunnan Province | 25.13180014 | 102.7481603 |
| K188 | China | Yunnan Province | 25.13180014 | 102.7481603 |
| K189 | China | Yunnan Province | 25.13180014 | 102.7481603 |
| K190 | China | Yunnan Province | 25.13180014 | 102.7481603 |
| K191 | China | Yunnan Province | 25.13180014 | 102.7481603 |
| K192 | China | Liaoning Province | 41.82446417 | 123.5643151 |
| K193 | China | Liaoning Province | 41.82446417 | 123.5643151 |
| K194 | China | Liaoning Province | 41.82446417 | 123.5643151 |
| K195 | China | Liaoning Province | 41.82446417 | 123.5643151 |
| K196 | China | Liaoning Province | 41.82446417 | 123.5643151 |
| K197 | China | Liaoning Province | 41.82446417 | 123.5643151 |
| K198 | China | Liaoning Province | 41.82446417 | 123.5643151 |
| K199 | Korea | Seoul | 37.5665 | 126.978 |
| K200 | Korea | Seoul | 37.5665 | 126.978 |
| K201 | Korea | Seoul | 37.5665 | 126.978 |
| K202 | Korea | Seoul | 37.5665 | 126.978 |
| K203 | Korea | Seoul | 37.5665 | 126.978 |
| K204 | Korea | Seoul | 37.5665 | 126.978 |
| K205 | Korea | Seoul | 37.5665 | 126.978 |
| K206 | Korea | Seoul | 37.5665 | 126.978 |
| K207 | Korea | Seoul | 37.5665 | 126.978 |
| K208 | Korea | Seoul | 37.5665 | 126.978 |
| K209 | Korea | Seoul | 37.5665 | 126.978 |
| K210 | Korea | Seoul | 37.5665 | 126.978 |
| K211 | China | Liaoning Province | 41.82446417 | 123.5643151 |
| K212 | China | Liaoning Province | 41.82446417 | 123.5643151 |
| K213 | China | Liaoning Province | 41.82446417 | 123.5643151 |
| K214 | China | Liaoning Province | 41.82446417 | 123.5643151 |
| K215 | China | Liaoning Province | 41.82446417 | 123.5643151 |
| K216 | China | Liaoning Province | 41.82446417 | 123.5643151 |
| K217 | China | Liaoning Province | 41.82446417 | 123.5643151 |

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|------|-------|-----------------------|-------------|-------------|
| K218 | China | Henan Province | 34.78592456 | 113.6580041 |
| K219 | China | Henan Province | 34.78592456 | 113.6580041 |
| K220 | China | Henan Province | 34.78592456 | 113.6580041 |
| K221 | China | Henan Province | 34.78592456 | 113.6580041 |
| K222 | China | Henan Province | 34.78592456 | 113.6580041 |
| K223 | China | Henan Province | 34.78592456 | 113.6580041 |
| K224 | China | Henan Province | 34.78592456 | 113.6580041 |
| K225 | China | Henan Province | 34.78592456 | 113.6580041 |
| K226 | China | Henan Province | 34.78592456 | 113.6580041 |
| K227 | China | Henan Province | 34.78592456 | 113.6580041 |
| K228 | China | Henan Province | 34.78592456 | 113.6580041 |
| K229 | China | Henan Province | 34.78592456 | 113.6580041 |
| K230 | China | Henan Province | 34.78592456 | 113.6580041 |
| K231 | China | Henan Province | 34.78592456 | 113.6580041 |
| K232 | China | Henan Province | 34.78592456 | 113.6580041 |
| K233 | China | Henan Province | 34.78592456 | 113.6580041 |
| K234 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K235 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K236 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K237 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K238 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K239 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K240 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K241 | China | Heilongjiang Province | 45.74162405 | 126.7200395 |
| K242 | China | Gansu Province | 36.09213241 | 103.6984961 |
| K243 | China | Gansu Province | 36.09213241 | 103.6984961 |
| K244 | China | Gansu Province | 36.09213241 | 103.6984961 |
| K245 | China | Gansu Province | 36.09213241 | 103.6984961 |
| K246 | China | Gansu Province | 36.09213241 | 103.6984961 |
| K247 | China | Gansu Province | 36.09213241 | 103.6984961 |
| K248 | China | Gansu Province | 36.09213241 | 103.6984961 |
| K249 | China | Gansu Province | 36.09213241 | 103.6984961 |
| K250 | China | Gansu Province | 36.09213241 | 103.6984961 |
| K251 | China | Gansu Province | 36.09213241 | 103.6984961 |
| K252 | China | Gansu Province | 36.09213241 | 103.6984961 |
| K253 | China | Gansu Province | 36.09213241 | 103.6984961 |
| K254 | China | Gansu Province | 36.09213241 | 103.6984961 |
| K255 | China | Gansu Province | 36.09213241 | 103.6984961 |
| K256 | China | Gansu Province | 36.09213241 | 103.6984961 |
| K257 | China | Gansu Province | 36.09213241 | 103.6984961 |
| K258 | China | Gansu Province | 36.09213241 | 103.6984961 |
| K259 | China | Gansu Province | 36.09213241 | 103.6984961 |
| K260 | China | Gansu Province | 36.09213241 | 103.6984961 |
| K261 | China | Jilin Province | 43.80787789 | 125.4037392 |

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|------|-------|----------------|-------------|-------------|
| K262 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K263 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K264 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K265 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K266 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K267 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K268 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K269 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K270 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K271 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K272 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K273 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K274 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K275 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K276 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K277 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K278 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K279 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K280 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K281 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K282 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K283 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K284 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K285 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K286 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K287 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K288 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K289 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K290 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K291 | China | Jilin Province | 43.80787789 | 125.4037392 |
| K292 | China | Jilin Province | 43.80787789 | 125.4037392 |
