# Supplementary Tables and Table Legends

**Table S1:** Crossing parents and number of offspring per cross for individuals included in population T2.

|  |  |  |
| --- | --- | --- |
| Female crossing parent | Male crossing parent | Number of individuals in bi-parental family |
| Cicero | Toluca | 4 |
| Cicero | Aracy | 9 |
| Carolus | Orla | 9 |
| Aracy | Carolus | 11 |
| Cicero | Carolus | 16 |
| Maestro | Carolus | 7 |
| Mandel | Carolus | 6 |
| Orla | Carolus | 1 |
| Carolus | Valor | 1 |
| Maestro | Orla | 16 |
| Princess | Orla | 9 |
| 93-1015 | Maestro | 7 |
| Maestro | Toluca | 4 |
| 0902170 | Maestro | 1 |
| Amour | Orla | 5 |
| Mandel | Toluca | 1 |
| Bionica | Sarpo Mira | 1 |
| C08II69 | Sarpo Mira | 2 |
| L4 | Sarpo Mira | 1 |
| Lady Balfour | Arielle | 1 |
| G09 2:4 1101 | Amandine | 2 |
| G09 2:4 1101 | Solist | 6 |
| G09 2:5 1702 | Solist | 2 |
| G09 2:6 1101 | Solist | 1 |
| 0902170 | Fakse | 3 |
| 93-1015 | Satina | 2 |
| C08II69 | Amandine | 2 |
| C08II69 | Solist | 2 |
| G09 2:4 1101 | Mandel | 6 |

**Table S2:** Crossing parents and number of offspring per cross for individuals included in population T3-7.

|  |  |  |
| --- | --- | --- |
| Female crossing parent | Male crossing parent | Number of individuals in bi-parental family |
| Aracy | Carolus | 2 |
| Carolus | Satina | 3 |
| Cicero | Carolus | 2 |
| D09 1:2 1701 | Carolus | 4 |
| Kina | Carolus | 1 |
| Mandel | Carolus | 1 |
| Orla | Carolus | 3 |
| Princess | Carolus | 1 |
| Toluca | Carolus | 2 |
| Carolus | Orla | 9 |
| Aracy | Carolus | 11 |
| Cicero | Carolus | 16 |
| Maestro | Carolus | 7 |
| Mandel | Carolus | 6 |
| Orla | Carolus | 1 |
| Carolus | Valor | 8 |
| Maestro | Toluca | 1 |
| Cicero | Toluca | 4 |
| Cicero | Aracy | 9 |
| 93-1015 | Maestro | 7 |
| Maestro | Toluca | 4 |
| Maestro | Orla | 16 |
| Princess | Orla | 9 |
| Mandel | Toluca | 1 |
| Orla | Lady Balfour | 1 |
| Amour | Orla | 5 |
| G09 2:4 1101 | Mandel | 6 |
| D09 1:2 1701 | Fontane | 2 |
| Aracy | Sarpo Mira | 1 |
| I09 2:2 2501 | Sarpo Mira | 1 |
| 93-1015 | Fontane | 1 |
| D08I56 | Fakse | 1 |
| C08I43 | Mayan Gold | 2 |
| I08I06 | Fontane | 2 |
| Princess | Toluca | 1 |
| Satina | 0903059 | 3 |
| 0902170 | Bionica | 1 |
| 0902170 | Satina | 3 |
| 0902188 | Satina | 1 |
| Bionica | Sarpo Mira | 3 |
| C08II69 | Sarpo Mira | 3 |
| C08II69 | Solist | 2 |
| L4 | Arielle | 1 |
| L4 | Sarpo Mira | 1 |
| Lady Balfour | Arielle | 1 |
| Lady Balfour | Sarpo Mira | 3 |
| Sarpo Mira | Salad Blue | 2 |
| G09 2:4 1101 | Amandine | 2 |
| G09 2:4 1101 | Solist | 6 |
| G09 2:5 1702 | Solist | 2 |
| G09 2:6 1101 | Solist | 1 |
| 0902170 | Fakse | 3 |
| 0902170 | Maestro | 1 |
| 93-1015 | Satina | 2 |
| C08II69 | Amandine | 2 |
| C08II69 | Solist | 2 |
| GRR | Superb | 2 |
| 2-IV | 2-IV | 2 |

*Continuation Table S2.*

**Table S3:** Analysis of variance of phenotypic traits included in the study**.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Degrees of freedom | Sum of squares | Mean of squares | F-value | P(>F) | Significance |
|  | Tuber weight | | | | | |
| Population | 2 | 76.820 | 38.410 | 545.900 | <2E-16 | \*\*\* |
| Residuals | 667 | 46.930 | 0.070 |  |  |  |
| Tuber number | | | | | | |
| Population | 2 | 6.099E+03 | 3.049E+03 | 456.500 | <2E-16 | \*\*\* |
| Residuals | 645 | 4.308E+03 | 6.700 |  |  |  |
| Average tuber weight | | | | | | |
| Population | 2 | 0.152 | 0.076 | 51.100 | <2e-16 | \*\*\* |
| Residuals | 645 | 0.962 | 0.001 |  |  |  |
| Specific gravity | | | | | | |
| Population | 1 | 0.001 | 0.001 | 10.580 | 0.001 | \*\* |
| Residuals | 198 | 0.013 | 6.530E-05 |  |  |  |
| Tuber size | | | | | | |
| Population | 1 | 8.500 | 8.495 | 8.252 | 0.005 | \*\* |
| Residuals | 198 | 203.800 | 1.029 |  |  |  |
| Tuber shape | | | | | | |
| Population | 1 | 0.220 | 0.223 | 0.157 | 0.692 | - |
| Residuals | 198 | 218.170 | 1.420 |  |  |  |
| Tuber eyes | | | | | | |
| Population | 1 | 0 | 0.003 | 0.002 | 0.965 | - |
| Residuals | 198 | 296.000 | 1.495 |  |  |  |

**Table S4:** Analysis of variance of phenotypic traits included in the study for the T1 population.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Degrees of freedom | Sum of squares | Mean of squares | F-value | P(>F) | Significance |
|  | Tuber weight | | | | | |
| Population | 4 | 2.443 | 0.611 | 12.290 | 1.66E-09 | \*\*\* |
| Residuals | 460 | 22.849 | 0.050 |  |  |  |
|  | Tuber number | | | | | |
| Population | 4 | 123.800 | 30.944 | 6.739 | 2.82E-05 | \*\*\* |
| Residuals | 460 | 2112.300 | 4.592 |  |  |  |
|  | Average tuber weight | | | | | |
| Population | 4 | 0.040 | 0.010 | 6.051 | 9.44E-05 | \*\*\* |
| Residuals | 460 | 0.754 | 0.002 |  |  |  |
|  | Late blight resistance | | | | | |
| Population | 4 | 261556.000 | 65389.000 | 7.742 | 4.82E-06 | \*\*\* |
| Residuals | 460 | 3885219.000 | 8446.000 |  |  |  |

**Table S5**: Results obtained for Tukey’s range test for differences among the five full-sib families from T1 for the four traits tuber weight per plant, tuber number per plant, average weight per tuber and host plant resistance to foliar late blight. Non-significant differences are denoted by ‘-’.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Populations | **Difference** in means | Lower confidence level | Upper confidence level | Adjusted p-value | Significance |
| Tuber weight | | | | | |
| B-A | 0.066 | -0.055 | 0.187 | 0.568 | - |
| C-A | 0.006 | -0.093 | 0.105 | 1.000 | - |
| D-A | 0.168 | 0.069 | 0.267 | 4.18E-05 | \*\*\* |
| E-A | 0.024 | -0.0911 | 0.140 | 0.979 | - |
| C-B | -0.060 | -0.159 | 0.039 | 0.462 | - |
| D-B | 0.102 | 0.003 | 0.201 | 0.039 | \* |
| E-B | -0.042 | -0.157 | 0.074 | 0.861 | - |
| D-C | 0.162 | 0.091 | 0.232 | <2E-16 | \*\*\* |
| E-C | 0.018 | -0.074 | 0.111 | 0.983 | - |
| E-D | -0.144 | -0.236 | -0.052 | 2.24E-04 | \*\*\* |
| Tuber number | | | | | |
| B-A | 1.044 | -0.118 | 2.206 | 0.102 | - |
| C-A | 0.364 | -0.588 | 1.316 | 0.834 | - |
| D-A | 1.395 | 0.445 | 2.344 | 6.43E-04 | \*\*\* |
| E-A | 0.458 | -0.651 | 1.568 | 0.790 | - |
| C-B | -0.680 | -1.632 | 0.272 | 0.289 | - |
| D-B | 0.351 | -0.599 | 1.300 | 0.850 | - |
| E-B | -0.586 | -1.695 | 0.524 | 0.598 | - |
| D-C | 1.031 | 0.354 | 1.707 | 3.45E-04 | \*\*\* |
| E-C | 0.095 | -0.792 | 0.981 | 0.998 | - |
| E-D | -0.936 | -1.821 | -0.052 | 0.032 | \* |
| Average tuber weight | | | | | |
| B-A | 0.004 | -0.018 | 0.026 | 0.986 | - |
| C-A | -0.004 | -0.022 | 0.014 | 0.968 | - |
| D-A | 0.018 | -1.10E-04 | 0.036 | 0.052 | - |
| E-A | 0.002 | -0.019 | 0.023 | 1.000 | - |
| C-B | -0.008 | -0.026 | 0.010 | 0.708 | - |
| D-B | 0.014 | -0.004 | 0.032 | 0.227 | - |
| E-B | -0.003 | -0.023 | 0.018 | 0.997 | - |
| D-C | 0.022 | 0.009 | 0.035 | 3.05E-05 | \*\*\* |
| E-C | 0.006 | -0.011 | 0.023 | 0.876 | - |
| E-D | -0.016 | -0.033 | 4.98E-04 | 0.062 | - |
| Late blight resistance | | | | | |
| B-A | 48.676 | -1.165 | 98.518 | 0.059 | - |
| C-A | -8.464 | -49.296 | 32.368 | 0.980 | - |
| D-A | -20.775 | -61.504 | 19.954 | 0.630 | - |
| E-A | -41.851 | -89.431 | 5.729 | 0.115 | - |
| C-B | -57.141 | -97.973 | -16.309 | 0.001 | \*\*\* |
| D-B | -69.451 | -110.180 | -28.722 | 3.89E-05 | \*\*\* |
| E-B | -90.527 | -138.107 | -42.948 | 2.80E-06 | \*\*\* |
| D-C | -12.311 | -41.326 | 16.705 | 0.773 | - |
| E-C | -33.387 | -71.424 | 4.651 | 0.116 | - |
| E-D | -21.076 | -59.003 | 16.851 | 0.549 | - |

# Supplementary Figure Legends

**Figure S1**: Principal coordinate analysis (PCoA) based on the Euclidian genetic distance between genotyped individuals in population T1. The five full-sib families of population T1 are separated by color. Four cultivars or breeding clones from the bi-parental crosses that produced the T1 families are included as breeding parents. PC1 and PC2 are the percent variance explained by the two first principal components.

**Figure S2**: Principal coordinate analysis (PCoA) based on the Euclidian genetic distance between genotyped individuals in populations T2 and T3-7. Populations are separated by color. PC1 and PC2 are the percent variance explained by the two first principal components.

**Figure S3A-D**: Phenotypic scores for (**A**) tuber weight per plant, (**B**) tuber number per plant, (**C**) average tuber weight and (**D**) host plant resistance to late blight, across the five families in the T1 population and clones and cultivars representing the breeding parents. The phenotypes (except for resistance to late blight) are adjusted per location by the means of five cultivars used as checks. Two full-sib families (T1-C and T1-D) are separated by color, as these are used in later cross- and within-family predictions and comparisons therewith may be of interest.