Common Garden Trait MEans

**Supplemental Table 1.** Population means, standard error, and sample size for both treatments at the common garden. Also included is seed-source coefficient of variation (CV %) of 30-year mean annual rainfall, 30-year mean spring precipitation and temperature. Letters in parenthesis represent groupings used to generalize means as described in the results section. (w) and (d) represent wet and dry source location, (h) and (c) represent hot and cold source location, (H) and (L) represent high variability and low variability sites.

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| **Common Garden** | | | | | | | | |
| **Trait** | **Pop-ulation** | **Spring Precip (mm)** | **Spring Temp (ºC)** | **CV (%)** | **Treatment** | **Trait Mean** | **Standard Error** | **n** |
| Survival (%) | 1 | 72.00(w) | 17.5(h) | 23.73(H) | Ambient | 0.68 | 0.08 | 37 |
| 1 |  |  |  | Watered | 0.91 | 0.05 | 34 |
| 2 | 58.80(w) | 17.6(h) | 29.63(L) | Ambient | 0.56 | 0.08 | 43 |
| 2 |  |  |  | Watered | 0.88 | 0.05 | 42 |
| 3 | 32.40(d) | 16.5(c) | 30.21(H) | Ambient | 0.85 | 0.07 | 27 |
| 3 |  |  |  | Watered | 0.96 | 0.04 | 27 |
| 4 | 29.00(d) | 17.8(h) | 28.77(L) | Ambient | 0.71 | 0.07 | 45 |
| 4 |  |  |  | Watered | 0.87 | 0.05 | 45 |
| 5 | 29.80(d) | 13.2(c) | 29.72(H) | Ambient | 0.64 | 0.07 | 45 |
| 5 |  |  |  | Watered | 0.84 | 0.05 | 45 |
| 6 | 36.00(d) | 16.6(h) | 31.95(L) | Ambient | 0.56 | 0.07 | 45 |
| 6 |  |  |  | Watered | 0.78 | 0.06 | 45 |
| 7 | 26.50(d) | 20.5(h) | 42.56(H) | Ambient | 0.73 | 0.07 | 45 |
| 7 |  |  |  | Watered | 0.91 | 0.04 | 45 |
| 8 | 58.00(w) | 14.0(c) | 26.68(L) | Ambient | 0.80 | 0.06 | 45 |
| 8 |  |  |  | Watered | 0.91 | 0.04 | 45 |
| 9 | 53.40(w) | 15.9(c) | 27.57(L) | Ambient | 0.52 | 0.09 | 33 |
| 9 |  |  |  | Watered | 0.71 | 0.08 | 34 |
| 10 | 48.90(w) | 16.6(c) | 27.85(L) | Ambient | 0.62 | 0.07 | 45 |
| 10 |  |  |  | Watered | 0.91 | 0.04 | 45 |
| 11 | 23.90(d) | 19.9(h) | 37.30(H) | Ambient | 0.67 | 0.08 | 39 |
| 11 |  |  |  | Watered | 0.87 | 0.06 | 38 |
| 12 | 54.20(w) | 13.2(c) | 33.30(L) | Ambient | 0.80 | 0.07 | 35 |
| 12 |  |  |  | Watered | 0.84 | 0.06 | 33 |
| Flowering (%) | 1 | 72.00(w) | 17.5(h) | 23.73(H) | Ambient | 0.51 | 0.08 | 37 |
| 1 |  |  |  | Watered | 0.50 | 0.09 | 34 |
| 2 | 58.80(w) | 17.6(h) | 29.63(L) | Ambient | 0.09 | 0.04 | 43 |
| 2 |  |  |  | Watered | 0.12 | 0.05 | 42 |
| 3 | 32.40(d) | 16.5(c) | 30.21(H) | Ambient | 0.37 | 0.09 | 27 |
| 3 |  |  |  | Watered | 0.40 | 0.10 | 27 |
| 4 | 29.00(d) | 17.8(h) | 28.77(L) | Ambient | 0.50 | 0.08 | 45 |
| 4 |  |  |  | Watered | 0.48 | 0.08 | 45 |
| 5 | 29.80(d) | 13.2(c) | 29.72(H) | Ambient | 0.13 | 0.05 | 45 |
| 5 |  |  |  | Watered | 0.13 | 0.05 | 45 |
| 6 | 36.00(d) | 16.6(h) | 31.95(L) | Ambient | 0.22 | 0.06 | 45 |
| 6 |  |  |  | Watered | 0.47 | 0.08 | 45 |
| 7 | 26.50(d) | 20.5(h) | 42.56(H) | Ambient | 0.18 | 0.06 | 45 |
| 7 |  |  |  | Watered | 0.27 | 0.07 | 45 |
| 8 | 58.00(w) | 14.0(c) | 26.68(L) | Ambient | 0.33 | 0.07 | 45 |
| 8 |  |  |  | Watered | 0.36 | 0.07 | 45 |
| 9 | 53.40(w) | 15.9(c) | 27.57(L) | Ambient | 0.39 | 0.09 | 33 |
| 9 |  |  |  | Watered | 0.59 | 0.09 | 34 |
| 10 | 48.90(w) | 16.6(c) | 27.85(L) | Ambient | 0.56 | 0.07 | 45 |
| 10 |  |  |  | Watered | 0.51 | 0.08 | 45 |
| 11 | 23.90(d) | 19.9(h) | 37.30(H) | Ambient | 0.49 | 0.08 | 39 |
| 11 |  |  |  | Watered | 0.61 | 0.08 | 38 |
| 12 | 54.20(w) | 13.2(c) | 33.30(L) | Ambient | 0.34 | 0.08 | 35 |
| 12 |  |  |  | Watered | 0.36 | 0.09 | 33 |
| Specific Leaf Area (g/cm2) | 1 | 72.00(w) | 17.5(h) | 23.73(H) | Ambient | 115.26 | 2.72 | 23 |
| 1 |  |  |  | Watered | 120.38 | 4.37 | 30 |
| 2 | 58.80(w) | 17.6(h) | 29.63(L) | Ambient | 95.64 | 1.96 | 26 |
| 2 |  |  |  | Watered | 108.60 | 3.01 | 37 |
| 3 | 32.40(d) | 16.5(c) | 30.21(H) | Ambient | 107.12 | 2.39 | 21 |
| 3 |  |  |  | Watered | 106.61 | 2.70 | 26 |
| 4 | 29.00(d) | 17.8(h) | 28.77(L) | Ambient | 102.83 | 1.19 | 33 |
| 4 |  |  |  | Watered | 113.33 | 1.94 | 37 |
| 5 | 29.80(d) | 13.2(c) | 29.72(H) | Ambient | 105.45 | 2.12 | 28 |
| 5 |  |  |  | Watered | 112.44 | 2.54 | 36 |
| 6 | 36.00(d) | 16.6(h) | 31.95(L) | Ambient | 85.60 | 1.80 | 25 |
| 6 |  |  |  | Watered | 101.06 | 2.89 | 34 |
| 7 | 26.50(d) | 20.5(h) | 42.56(H) | Ambient | 101.00 | 2.10 | 33 |
| 7 |  |  |  | Watered | 107.53 | 2.59 | 41 |
| 8 | 58.00(w) | 14.0(c) | 26.68(L) | Ambient | 103.08 | 2.17 | 36 |
| 8 |  |  |  | Watered | 112.17 | 2.29 | 40 |
| 9 | 53.40(w) | 15.9(c) | 27.57(L) | Ambient | 100.83 | 2.73 | 18 |
| 9 |  |  |  | Watered | 110.23 | 3.31 | 22 |
| 10 | 48.90(w) | 16.6(c) | 27.85(L) | Ambient | 114.77 | 2.61 | 32 |
| 10 |  |  |  | Watered | 124.18 | 3.34 | 38 |
| 11 | 23.90(d) | 19.9(h) | 37.30(H) | Ambient | 112.5 | 2.85 | 26 |
| 11 |  |  |  | Watered | 120.56 | 2.02 | 32 |
| 12 | 54.20(w) | 13.2(c) | 33.30(L) | Ambient | 98.13 | 1.90 | 28 |
| 12 |  |  |  | Watered | 107.91 | 2.37 | 28 |

Greenhouse Trait MEans

**Supplemental Table 2.** Population means, standard error, and sample size for both treatments at the greenhouse. Also included is seed-source coefficient of variation (CV %) of 30-year mean annual rainfall, 30-year mean spring precipitation and temperature. Letters in parenthesis represent groupings used to generalize means as described in the results section. (w) and (d) represent wet and dry source location, (h) and (c) represent hot and cold source location, (H) and (L) represent high variability and low variability sites.

| **Greenhouse** | | | | | | | |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Trait** | **Pop-ulation** | **Spring Precip (mm)** | **Spring Temp (ºC)** | **CV (%)** | **Treatment** | **Trait Mean** | **Standard Error** | **n** |
| Specific Leaf Area (g/cm2) | 1 | 23.90(d) | 19.9(h) | 37.30(H) | Drought | 107.09 | 7.04 | 44 |
| 1 | Control | 91.60 | 5.87 | 44 |
| 2 | 54.20(w) | 13.2(c) | 33.30(L) | Drought | 121.13 | 7.30 | 44 |
| 2 | Control | 142.60 | 7.73 | 43 |
| 3 | 72.00(w) | 17.5(h) | 23.73(H) | Drought | 81.01 | 2.84 | 44 |
| 3 | Control | 90.20 | 4.26 | 44 |
| 4 | 58.80(w) | 17.6(h) | 29.63(L) | Drought | 87.15 | 4.96 | 43 |
| 4 | Control | 88.05 | 4.65 | 44 |
| 5 | 32.40(d) | 16.5(c) | 30.21(H) | Drought | 80.60 | 6.79 | 36 |
| 5 | Control | 90.90 | 5.09 | 38 |
| 6 | 29.00(d) | 17.8(h) | 28.77(L) | Drought | 63.20 | 3.74 | 42 |
| 6 | Control | 63.27 | 4.29 | 44 |
| 7 | 29.80(d) | 13.2(c) | 29.72(H) | Drought | 153.26 | 5.56 | 44 |
| 7 | Control | 125.82 | 5.26 | 44 |
| 8 | 36.00(d) | 16.6(h) | 31.95(L) | Drought | 94.97 | 3.56 | 42 |
| 8 | Control | 93.94 | 4.68 | 44 |
| 9 | 26.50(d) | 20.5(h) | 42.56(H) | Drought | 84.36 | 3.60 | 35 |
| 9 | Control | 92.43 | 3.73 | 39 |
| 10 | 58.00(w) | 14.0(c) | 26.68(L) | Drought | 96.92 | 8.55 | 23 |
| 10 | Control | 91.44 | 9.10 | 24 |
| 11 | 53.40(w) | 15.9(c) | 27.57(L) | Drought | 109.03 | 8.10 | 26 |
| 11 | Control | 98.13 | 7.21 | 28 |
| 12 | 48.90(w) | 16.6(c) | 27.85(L) | Drought | 91.92 | 4.36 | 40 |
| 12 | Control | 90.00 | 4.95 | 39 |
| Total Biomass (mg) | 1 | 23.90(d) | 19.9(h) | 37.30(H) | Drought | 42.24 | 2.64 | 30 |
| 1 |  |  |  | Control | 44.75 | 2.42 | 37 |
| 2 | 54.20(w) | 13.2(c) | 33.30(L) | Drought | 33.41 | 1.78 | 40 |
| 2 |  |  |  | Control | 39.54 | 2.21 | 41 |
| 3 | 72.00(w) | 17.5(h) | 23.73(H) | Drought | 44.30 | 1.00 | 39 |
| 3 |  |  |  | Control | 55.28 | 1.96 | 42 |
| 4 | 58.80(w) | 17.6(h) | 29.63(L) | Drought | 33.54 | 1.27 | 40 |
| 4 |  |  |  | Control | 41.90 | 1.79 | 42 |
| 5 | 32.40(d) | 16.5(c) | 30.21(H) | Drought | 34.36 | 1.94 | 32 |
| 5 |  |  |  | Control | 36.94 | 2.63 | 36 |
| 6 | 29.00(d) | 17.8(h) | 28.77(L) | Drought | 34.84 | 1.50 | 41 |
| 6 |  |  |  | Control | 42.76 | 1.64 | 44 |
| 7 | 29.80(d) | 13.2(c) | 29.72(H) | Drought | 36.94 | 1.17 | 44 |
| 7 |  |  |  | Control | 49.14 | 1.63 | 41 |
| 8 | 36.00(d) | 16.6(h) | 31.95(L) | Drought | 47.62 | 1.11 | 44 |
| 8 |  |  |  | Control | 63.04 | 2.16 | 44 |
| 9 | 26.50(d) | 20.5(h) | 42.56(H) | Drought | 52.89 | 1.73 | 32 |
| 9 |  |  |  | Control | 53.61 | 2.73 | 25 |
| 10 | 58.00(w) | 14.0(c) | 26.68(L) | Drought | 43.49 | 2.61 | 21 |
| 10 |  |  |  | Control | 45.89 | 3.91 | 23 |
| 11 | 53.40(w) | 15.9(c) | 27.57(L) | Drought | 40.18 | 2.77 | 21 |
| 11 |  |  |  | Control | 46.98 | 3.25 | 23 |
| 12 | 48.90(w) | 16.6(c) | 27.85(L) | Drought | 37.06 | 1.80 | 41 |
| 12 |  |  |  | Control | 42.02 | 2.53 | 40 |
| Root:Shoot Ratio | 1 | 23.90(d) | 19.9(h) | 37.30(H) | Drought | 1.34 | 0.05 | 30 |
| 1 |  |  |  | Control | 1.05 | 0.04 | 37 |
| 2 | 54.20(w) | 13.2(c) | 33.30(L) | Drought | 1.10 | 0.04 | 40 |
| 2 |  |  |  | Control | 0.97 | 0.03 | 41 |
| 3 | 72.00(w) | 17.5(h) | 23.73(H) | Drought | 0.94 | 0.04 | 39 |
| 3 |  |  |  | Control | 0.70 | 0.03 | 42 |
| 4 | 58.80(w) | 17.6(h) | 29.63(L) | Drought | 1.09 | 0.06 | 40 |
| 4 |  |  |  | Control | 0.87 | 0.03 | 42 |
| 5 | 32.40(d) | 16.5(c) | 30.21(H) | Drought | 1.22 | 0.05 | 32 |
| 5 |  |  |  | Control | 1.03 | 0.03 | 36 |
| 6 | 29.00(d) | 17.8(h) | 28.77(L) | Drought | 1.78 | 0.07 | 41 |
| 6 |  |  |  | Control | 1.27 | 0.04 | 44 |
| 7 | 29.80(d) | 13.2(c) | 29.72(H) | Drought | 1.23 | 0.04 | 44 |
| 7 |  |  |  | Control | 1.12 | 0.04 | 41 |
| 8 | 36.00(d) | 16.6(h) | 31.95(L) | Drought | 1.23 | 0.05 | 44 |
| 8 |  |  |  | Control | 1.15 | 0.04 | 44 |
| 9 | 26.50(d) | 20.5(h) | 42.56(H) | Drought | 2.41 | 0.09 | 32 |
| 9 |  |  |  | Control | 1.34 | 0.06 | 25 |
| 10 | 58.00(w) | 14.0(c) | 26.68(L) | Drought | 1.31 | 0.05 | 21 |
| 10 |  |  |  | Control | 1.20 | 0.06 | 23 |
| 11 | 53.40(w) | 15.9(c) | 27.57(L) | Drought | 1.44 | 0.10 | 21 |
| 11 |  |  |  | Control | 0.88 | 0.03 | 23 |
| 12 | 48.90(w) | 16.6(c) | 27.85(L) | Drought | 0.98 | 0.04 | 41 |
| 12 |  |  |  | Control | 0.92 | 0.04 | 40 |

Supplemental Table 3. Common garden linear mixed model selection. Treatment, SAT (30yr Spring annual temp), SAP (30-year Spring annual precipitation), and CV (coefficient of variation for annual precipitation) were the fixed variables, while population nested within plot was the random variable

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| --- | --- | --- |
| **Trait** | **Model** | **AIC** |
| Mortality | ~ SAT\*Treatment + SAP\*Treatment + CV\*Treatment | 959.06 |
| ~ SAT\*Treatment + SAP + CV\*Treatment | 957.16 |
| ~ SAT\*Treatment + SAP + CV | 955.51 |
| ~ SAT\*Treatment + CV | 954.06 |
| ~ Treatment + SAT + CV | 954.39 |
| ~ Treatment + CV | 942.51 |
| Flowering | ~ SAT\*Treatment + SAP\*Treatment + CV\*Treatment | 1210.48 |
| ~ SAT\*Treatment + SAP\*Treatment + CV | 1208.68 |
| ~ SAT\*Treatment + SAP + CV | 1208.1 |
| ~ Treatment + SAT + SAP + CV | 1206.45 |
| ~ Treatment + SAT + SAP | 1204.66 |
| ~ SAT + SAP | 1203.72 |
| Specific Leaf Area | ~ SAT\*Treatment + SAP\*Treatment + CV\*Treatment | -779.95 |
| ~ SAT\*Treatment + SAP + CV\*Treatment | -793.89 |
| ~ SAT + SAP + CV\*Treatment | -804.21 |
| ~ Treatment + SAT + SAP + CV | -816.1 |
| ~ Treatment + CV + SAP | -827.66 |
| ~ Treatment + SAP | -836.80 |

Supplemental Table 4. Greenhouse linear mixed model selection.

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| --- | --- | --- |
| **Trait** | **Model** | **AIC** |
| Specific Leaf Area | ~ SAT\*Treatment + SAP\*Treatment + CV\*Treatment | 456.80 |
| ~ SAT\*Treatment + SAP\*Treatment + CV | 446.78 |
| ~ SAT\*Treatment + SAP + CV | 436.35 |
| ~ Treatment + SAT + SAP + CV | 428.51 |
| ~ SAT + SAP + CV | 421.25 |
| ~ SAT + CV | 410.77 |
| Root:Shoot Ratio | ~ SAT\*Treatment + SAP\*Treatment + CV\*Treatment | 203.03 |
| ~ SAT\*Treatment + SAP + CV\*Treatment | 190.92 |
| ~ SAT\*Treatment + SAP + CV | 180.40 |
| ~ SAT\*Treatment + SAP | 172.75 |
| Total Biomass | ~ SAT\*Treatment + SAP\*Treatment + CV\*Treatment | -4987.58 |
| ~ SAT\*Treatment + SAP + CV\*Treatment | -5006.31 |
| ~ SAT + SAP + CV\*Treatment | -5021.32 |
| ~ SAT + CV\*Treatment | -5038.57 |
| ~ CV\*Treatment | -5051.93 |