**Supplemental Table S1: Influence of foliar application of Ca on amino acid and organic acid concentrations of both roots and leaves in sugar beet plants exposed to drought stress.** Plants were grown in pots for a duration of eight weeks. Five-week-old sugar beet plants were kept at 90% field capacity as control or exposed to drought stress (30% field capacity) and for a duration of three weeks. Ca was applied at BBCH14 and BBCH18 in concentration of 5L ha-1 corresponding to 540g Ca ha-1. Leaves and beetroot were harvested at 60 days after sowing for analysis of amino and organic acids. Bars indicate means ± SEM. Different letters denote significant differences according to ANOVA followed by SNK test (p < 0.05; n = 6). Abbreviations are: Ala, alanine; Asn, asparagine; Asp, aspartate; GABA, gamma-aminobutyric acid; Gln, glutamine; Glu, glutamate; Gly, glycine; His, histidine; Ile, isoleucine; Leu, leucine; Lys, lysine; Pro, proline; Ser, serine; Thr, threonine; Trp, tryptophan; Tyr, tyrosine; Val, valine; and NA, not detected.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Beetroot** | | | **Leaves** | | |
|  |  | **Control** | **Drought** | **Drought+ Ca** | **Control** | **Drought** | **Drought+ Ca** |
| **Amino acids (mg g-1 DW)** | **Ala** | 0.09 ± 0.06ns | 0.09 ± 0.04ns | 0.07 ± 0.01ns | 0.19 ± 0.03ns | 0.19 ± 0.08ns | 0.21 ± 0.03ns |
| **Asn** | 0.16 ± 0.03b | 0.17 ± 0.02b | 0.24 ± 0.04a | 0.19 ± 0.03ns | 0.18 ± 0.08ns | 0.19 ± 0.03ns |
| **Asp** | 0.07 ± 0.01ns | 0.07 ± 0.01ns | 0.08 ± 0.01ns | NA | NA | 0.04 ± 0.02 |
| **GABA** | 0.47 ± 0.11b | 0.81 ± 0.09a | 0.89 ± 0.20a | 0.67 ± 0.13b | 1.04 ± 0.36a | 0.64 ± 0.09b |
| **Gln** | 1.29 ± 0.11b | 1.41 ± 0.35b | 1.82 ± 0.32a | 0.29 ± 0.06a | 0.19 ± 0.06b | 0.25 ± 0.05ab |
| **Glu** | 0.83 ± 0.08a | 0.51 ± 0.18b | 0.34 ± 0.21b | 1.88 ± 0.10a | 1.40 ± 0.19b | 1.98 ± 0.21a |
| **Gly** | 0.02 ± 0.01b | 0.02 ± 0.01b | 0.03 ± 0.01a | NA | NA | NA |
| **His** | 0.03 ± 0.002ns | 0.04 ± 0.006ns | 0.04 ± 0.004ns | 0.07 ± 0.03b | 0.13 ± 0.04a | 0.08 ± 0.01b |
| **Ile** | 0.11 ± 0.05b | 0.15 ± 0.04ab | 0.19 ± 0.04a | 0.14 ± 0.03ns | 0.12 ± 0.01ns | 0.13 ± 0.02ns |
| **Leu** | 0.06 ± 0.02b | 0.10 ± 0.03ab | 0.14 ± 0.04a | NA | NA | NA |
| **Lys** | 0.06 ± 0.04b | 0.06 ± 0.03b | 0.13 ± 0.06a | 0.02 ± 0.002ns | NA | 0.03 ± 0.01ns |
| **Pro** | 0.03 ± 0.004ns | 0.03 ± 0.002ns | 0.04 ± 0.02ns | 0.06 ± 0.01ns | 0.05 ± 0.01ns | 0.05 ± 0.01ns |
| **Ser** | 0.15 ± 0.003b | 0.20 ± 0.03a | 0.21 ± 0.03a | 0.16 ± 0.02ns | 0.14 ± 0.04ns | 0.22 ± 0.08ns |
| **Thr** | NA | NA | NA | 0.09 ± 0.02ns | 0.09 ± 0.02ns | 0.11 ± 0.01ns |
| **Trp** | 0.05 ± 0.02b | 0.09 ± 0.02a | 0.09 ± 0.02a | 0.06 ± 0.03b | 0.11 ± 0.02a | 0.08 ± 0.01b |
| **Tyr** | NA | NA | NA | 0.11 ± 0.02ns | 0.09 ± 0.02ns | 0.09 ± 0.02ns |
| **Val** | 0.06 ± 0.02ns | 0.06 ± 0.01ns | 0.08 ± 0.03ns | 0.08 ± 0.02ns | 0.06 ± 0.01ns | 0.08 ± 0.01ns |
| **Organic acids (µg g-1 FW)** | **Citrate** | 99.54 ± 6.05ab | 113.12 ± 21.56a | 84.28 ± 7.61b | 228.69 ± 47.42ns | 265.39 ± 65.60ns | 249.95 ± 41.68ns |
| **Fumarate** | 21.39 ± 2.29ns | 23.25 ± 2.74ns | 22.51 ± 3.06ns | 327.87 ± 80.33b | 563.10 ± 227.32ab | 680.03 ± 209.92a |
| **Isocitrate** | 21.88 ± 5.26ns | 27.24 ± 4.07ns | 23.34 ± 3.78ns | 42.28 ± 8.05b | 51.99 ± 15.85b | 75.03 ± 19.90a |
| **Malate** | 22.23 ± 3.15ns | 24.02 ± 3.94ns | 26.70 ± 3.76ns | 193.19 ± 33.84b | 282.18 ± 81.81a | 306.86 ± 40.96a |
| **Succinate** | 3.33 ± 0.28ns | 2.65 ± 0.48ns | 2.60 ± 0.70ns | 4.02 ± 0.54ns | 3.52 ± 0.68ns | 3.80 ± 0.55ns |

**Supplemental Table S2.** List of primers used for qRT-PCR.

|  |  |  |  |
| --- | --- | --- | --- |
| **GENE** | **FORWARD PRIMER** | **REVERSE PRIMER** | **AMPLICON SIZE (BP)** |
| *BvSUC3* | TTGACACTGACTGGATGGGA | AGCACCTTCTCTGACACCTT | 98 |
| *BvTST1* | TCACTTACTCCTTGCCCGTC | GAGATGACACAAACCACAGCA | 82 |
| *BvTST3* | AGGGCTTGGAACTGGGAAA | TATCTGTGGTGGCTTCTTCATC | 80 |
| *BvSUT1* | CCTCAGATGTTTGTGTCGGTAA | AAAGGAAAGGATGGCACTGG | 117 |
| *BvGR* | CGCCCAAGGACAACTCTG | TCAGCCTCTTCGTGTTAGGA | 133 |
| *BvCMO* | TGAGCCTGCCTTTTATTCCC | AAGTTCGCCTTGACCATCTC | 157 |
| *BvDREB2A* | ATCGGTGGCTGAAACTCTTG | CCTAACAGGCTTACCTTCCTTG | 82 |
| *BvEF1α* | ATTGCCACACCTCCCACA | ACCATACCAGCATCACCATTC | 121 |
| *Bv18srRNA* | AACCATAAACGATGCCGACC | TTTCAGCCTTGCGACCATAC | 115 |
| *Bv*β*-tubulin* | CACCAAAGAAGTAGATGAGCAGA | GTTACCAACGAATGTAGAAGCCA | 145 |



**Supplemental Figure S1: Influence of foliar application of Ca on the expression levels of drought stress markers in sugar beet exposed to drought stress.** (A) Relative *BvCMO* mRNA levels in leaves and (B) relative *BvDREB2A* mRNA levels in leaves. Plants were grown in pots for a duration of eight weeks. Five-week-old sugar beet plants were kept at 90% field capacity as control or exposed to drought stress (30% field capacity) and for a duration of three weeks. Ca was applied at BBCH14 and BBCH18 in concentration of 5L ha-1 corresponding to 540g Ca ha-1. Leaves were harvested at 60 days after sowing for gene expression analysis. Bars indicate means ± SD (n = 6).



**Supplemental Figure S2: Influence of foliar application of Ca on total solute concentrations in sugar beet plants exposed to drought stress.** (A) Total solutes (amino acids, Na and K) without sucrose; (B) Total solutes (amino acids, Na, K) with sucrose. Plants were grown in pots for a duration of eight weeks. Five-week-old sugar beet plants were kept at 90% field capacity as control or exposed to drought stress (30% field capacity) and for a duration of three weeks. Ca was applied at BBCH14 and BBCH18 in concentration of 5L ha-1 corresponding to 540g Ca ha-1. Leaves and beetroot were harvested at 60 days after sowing for total solute and sugar analysis. Bars indicate means ± SD. Different letters denote significant differences according to ANOVA followed by SNK test (p < 0.05; n = 6).