ADAPTIVE RESPONSE MECHANISMS OF THREE NOVEL OREGANO CULTIVARS EXPOSED TO WATER STRESS

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Water stress effect on oregano is poorly reported. The aim was to evaluate adaptive mechanisms of three oregano cultivars (Origanum vulgare subsp. vulgare cv. Don Bastías FCA-INTA, Origanum vulgare subsp. hirtum cv. Alpa Sumaj FCA-INTA and Origanum x majoricum Cambess. cv. Aguanda FCA-INTA), exposed to two stable-water stress levels (moderate: -6b and severe: -12b) under greenhouse conditions for 21 days. Biomass partitioning patterns, total biomass, chlorophyll content, leaf area, specific leaf area, transpiration rate and water use efficiency were determined. Analysis showed that water stress triggered different adaptive response mechanisms in studied cultivars. First, mechanism triggered by Alpa Sumaj involved lower leaf area, chlorophyll content and specific leaf area, which suggest that potential photosynthesis was sharply reduced. An intense transpiration control mechanism was revealed. Second, Don Bastías showed a lesser extent reduction of leaf area and increase of chlorophyll concentration and specific foliar area. This suggests that higher photosynthesis rate was maintained, increasing biomass even though lower transpiration rate regulation. Last, Aguanda achieved higher root biomass, controlled rapidly transpiration and photosynthesis-associated variables suggest a higher photosynthetic rate. Thus, Aguanda attained higher biomass because increased water uptake ability and enhanced water use efficiency. Consequently, Aguanda showed more adaptation to water stress.

FRUIT LIPIDOME REMODELLING OF TOMATO VARIETIES WITH DIFFERENTIAL TOLERANCE TO POSTHARVEST CHILLING INJURY

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Chilling injury (CI) limits cold storage (CS) of tomato fruit. The effect of CS on the lipidome of tomato fruits of two contrasting varieties was analyzed to understand the mechanisms of generation of postharvest CI. Micro-Tom (tolerant) and Minitomato (sensible) fruits were harvested at mature green stage, refrigerated four weeks (4ºC) and then transferred to a shelf in the growing cabinet (25 ºC). The pericarp lipid composition was analyzed by liquid chromatography-tandem mass spectrometry (LC-MS/MS).
The CS effect on the lipidome was different in the two varieties: the glycerolipids unsaturation degree increased in both varieties, but returned to the initial value after CS only in Micro-Tom; the average acyl chain longitude decreased in Micro-Tom glycolipids and increased in Minitomato phospholipids; the relative content of mono- and digalactosyldiacylglycerol diminished and increased, respectively, in both varieties and returned to the initial values after CS, although Minitomato recovering was slower; and the phosphatidylethanolamine relative content increased, while the phosphatidylcholine relative content decreased, only in Minitomato.
The different effect of CS on membrane lipid composition between the varieties would be related with differential capacity to maintain appropriate membrane fluidity and can explain the differential sensibility of Micro-Tom and Minitomato tomato fruits to CI.

PHOTOSYNTHETIC TRAITS FOR THE EVALUATION OF FLOODING IN SOYBEAN GM LINE

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Soybean (Glycine max L. Merrill) is an important crop around the world. Molecular biology, associated with breeding and genetics, seek to develop tolerant genotypes to growth in stressful areas. The objective of this work was to compare genetically modified (GM) soybean strains for tolerance to soil flooding. The experiment was conducted at Embrapa / Pelotas-RS, in the agricultural year 2017/2018. Two soybean genotypes, AtAREB1(AREB) GM line and wild-type (BR16) were submitted to two water regimes: no flooding (control) and flooding at the R1 / R2 development stage. Measurements of stomatal conductance (gs), transpiration (E) and CO2 assimilation (Pn) were performed, after 36 h of flooding. The experimental design was completely randomized. The variables were submitted to ANOVA and Scott-Knott test $p < 0.05$. The water use efficiency (WUE) was calculated using WUE = Pn / gs. Under flooding, gs and E were significantly lower in BR16 compared to AREB and Pn did not differ for both genotypes. AREB was able to keep CO2 assimilation rates with lower WUE than BR16. Similar responses were observed in control plants of two genotypes for all parameters.

EFFECT OF SALINITY ON POLYAMINES IN ALFALFA - SINORHIZOBIUM MELILOTI SYMBIOSIS

EFECTO DE LA SALINIDAD SOBRE LAS POLIAMINAS EN LA SIMBIOSIS ALFALFA – SINORHIZOBIUM MELILOTI

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Las poliaminas (PAs) son compuestos nitrogenados presentes en las plantas que se acumulan en condiciones de estrés. El objetivo de este trabajo fue evaluar la participación de PAs en respuesta a estrés salino del cultivar de Medicago sativa sensible a salinidad WL 903 en asociación con la cepa Sinorhizobium meliloti B399. Las plantas fueron cultivadas en invernadero en condiciones normales (control) y el con solución salina (NaCl 120 mM). Ambos tratamientos se inocularon con cepa B399 cultivada en medio de manitol con extracto de levadura (YEM, control) y bacterias de esta cepa pre-adaptadas a condiciones de salinidad (YEM + NaCl 200 mM). En condición salina se encontró que las PAs en nódulos (espermina, espermidina, homospermidina y cadaverina) aumentaron en comparación al control, a la inversa de la putrescina que disminuyó su concentración. La misma situación ocurrió en PAs medidas en hojas. El peso seco aéreo y de planta entera y la actividad nitrogenasa disminuyeron cuando se comparó con el control. Sin embargo, cuando las plantas de alfalfa se inocularon con B399 adaptada a salinidad, se encontró diferencias significativas con un aumento de estos parámetros en comparación con la cepa no adaptada.

VARIABILITY DETERMINATION IN MORPHOLOGICAL AND ARCHITECTURAL PARAMETERS IN FOUR SOYBEAN GENOTYPES (GLYCINE MAX (L.) MERRILL)

DETERMINACIÓN DE VARIABILIDAD EN PARÁMETROS MORFOLÓGICOS Y ARQUITECTURALES EN CUATRO GENOTIPOS DE SOJA (GLYCYNE MAX (L) MERRILL)

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El déficit hídrico (DH) provoca diferentes efectos sobre la fisiología y la morfología de las plantas, dependiendo de la intensidad, duración y el estadio de desarrollo. Así, el DH modifica la arquitectura de las plantas, determinando síndromes de respuesta. Se evaluaron cuatro genotipos de soja de diferentes grupos de maduración: Munasqa (M7.5), Tijereta (T4.9), y Santa Rosa (SR4.5 y SR8.4) con el objetivo de determinar variabilidad en parámetros morfo-arquitecturales. El experimento se realizó en invernadero (FCA-UNL) bajo condiciones semicontroladas. Las plantas crecieron en macetas de 10 litros y se regaron con solución Hoagland. Se analizaron parámetros morfo-arquitecturales desde la germinación hasta R2-R4. Los parámetros con mayor variabilidad intraespecífica fueron: número de nudos en el tallo principal, proporción de ramas de segundo orden (45 %) y posición topológica de inflorescencias, mayor al 100 % en el caso del genotipo M7.5 y T4.9 comparados con los materiales SR. Esto permitió determinar dos grupos: uno con el 90 % de las inflo-