Gene Expression in Response to Water-Deficit Stress in Cotton. (C07-meek093026-Oral)

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Abstract:

Water-deficit stress is a major limiting factor in cotton (Gossypium hirsutum L.) production, but the level of drought tolerance among widely grown cultivars is unknown. Seven cultivars representative of most of the major cotton areas were chosen. These included Maxxa (west), Sphinx (southwest), Fibermax (midsouth), Deltapine Nu33B, Stoneville 747, Sure-Grow 474 (Mississippi River Delta), and.Paymaster 1218 (east). An Australian cultivar, Siokra L-23, was included for its known level of drought tolerance. Physiological characterization under water-deficit stressed conditions indicated a narrow range of osmotic adjustment with the only significant difference being between Maxxa (12 %) and Sphinx (44 %). Several cultivars showed significant increases in photosynthetic rate at three days after stress cessation compared to control plants, especially Siokra L-23 and Sphinx. Leaf epicuticular wax content was significantly higher in stressed plants, and transpiration rates were inversely related wax content. Based on physiological results, Maxxa, Sphinx, Paymaster 1218, and Siokra L-23 were chosen for molecular characterization. Currently these cultivars are being screened for gene expression related to proline and trehalose metabolism via northern blot analyses.

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