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UTILIZING VARIOUS PLANT CHARACTERISTICS AS CRITERIA IN BREEDING FOR DROUGHT TOLERANCE IN SUNFLOWER

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Numerous plant characteristics have been proposed as selection criteria to improve drought tolerance in plants. In these experiments the following characteristics were evaluated for their contribution toward drought tolerance improvement in sunflower: stomatal diffusion resistance, stomatal size, stomatal frequency per mm,^{2} leaf water potential, root dry weight, shoot dry weight and root to shoot ratio. Root and shoot dry weight and root to shoot ratio were determined in 1978 only and all other characters were measured in 1977 and 1978. All measurements were made in the greenhouse. Four sunflower (*Helianthus annus L.*) genotypes were grown under four different water treatments. Significant differences were obtained among genotypes for stomatal frequency and stomatal size, as well as stress timing. Plants subjected to water stress during the budding stage have a greater dry matter reduction, fewer number of stomata, larger aperture size, and higher stomatal resistance. Stress at the budding stage has the greatest effect in overall plant growth.

Additional index words: Stomatal diffusion resistance, stomatal size, leaf water potential, root dry weight, shoot dry weight, root to shoot ratio, stress timing.

Root dry weight (Percent increase or decrease over untreated-control)

Shoot dry weight (Percent increase or decrease over untreated-control)