

## Abstract

This work monitors the response of plants to the application of a solution of synthetic brassinosteroid (5-fluor-3 $\alpha$ ,17 $\beta$ -dihydroxy-5 $\alpha$ -pregnan-6-on) under drought stress conditions and subsequent restoration of water availability. The response of two plant species was monitored under six-day period of cessation of watering and under six-day period of renewed optimal water supply. The experiments were carried out on plants with different type of photosynthesis – C3 plant *Vicia faba* L. and C4 plant *Zea mays* L.. For both plant species, three varieties/genotypes were used. Photosynthetic, morphological and developmental characteristics were monitored.

The brassinosteroid treatment influenced more the morphological than the photosynthetic characteristics. The content of photosynthetic pigments was influenced more than the chlorophyll fluorescence parameters. The differences in morphological characteristics between individual varieties/genotypes were observed. The response to the application of brassinosteroid was observed especially for drought-sensitive variety/genotype.

Application of brassinosteroid caused increase of the dry mass of leaves and roots, the height to leaf , the height of the whole plant and its increment under stress and post-stress periods in both plant species. The content of photosynthetic pigments increased only in plants of maize under the stress conditions and in both plant species under the post-stress conditions. Chlorophyll fluorescence parameters were not influenced.

The response of plants to the application of brassinosteroid under the water stress condition is dependent on type and concentration of brassinosteroid, plant species and its variety/genotype.

**Keywords:** brassinosteroids, carotenoids, chlorofyll, chlorofyll fluorescence, morphology, plant development, photosynthesis, recovery, *Vicia faba* L., water deficit, *Zea mays* L.