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## Production and Physiological Characters of Soybean under Drought Stress with Foliar Application of Exogenous Antioxidant

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### Abstract

Climate change is a serious threat to the agricultural sector, and it is one of the causes of drought as a major environmental stress factor that affects the growth and development of plants. Drought stress in soybean as one of the food crops of protein sources, will have a serious impact on changes in plant growth and yield, physiological and biochemical aspects of plant cell damage due to oxidative stress caused by increased free radical accumulation in the form of reactive oxygen species in plants. One approach for improving the tolerance of oxidative stress in soybean under drought stress is the application of exogenous antioxidants. The aim of the research was to investigate the effect of foliar application of exogenous antioxidant on production and physiological characters of soybean under drought stress. The research used a factorial randomised block design with 2 factors and 3 replications. The first factor was drought stress treatment, namely 80 %, 60 % and 40 % of field capacity. The second factor was the foliar application of exogenous antioxidant consisted of without exogenous antioxidant application ; salicylic acid (500 ppm), ascorbic acid (500 ppm),  $\alpha$ -tocopherol (500 ppm) and chitosan (500 ppm). The results suggest that increased drought stress conditions caused for decreasing of stomatal density, total chlorophyll, total leaf area, relative water content, number of pods containing and 100 seeds weight. Effect of ascorbic acid as an exogenous antioxidant increased the total chlorophyll, total leaf area, number of pods containing and relative water content, while chitosan treatment increased stomatal density. Effect of exogenous antioxidants on drought stress showed the important of the role of exogenous antioxidants in reducing the effect of water stress on production and physiological characters of soybean

**Keywords:** Antioxidant exogenous, drought stress, foliar application, soybean