

THE EFFECT OF PHOSPHORUS AND IRON ON PLANT GROWTH AND NUTRIENT STATUS OF TWO SOYBEAN (GLYCINE MAX. L.) CULTIVARS UNDER SUBOPTIMAL WATER REGIME OF SOIL

Vladimir ROTARU¹

E-mail: rotaruvlad@yahoo.com

Abstract

Phosphorus (P) and iron (Fe) deficiencies are common in many soils. A pot experiment was conducted to investigate the effects of P and Fe application on the biomass production and nutrient status of two soybean (*Glycine max.* L. Merr) cultivars under water stress conditions. The soil experiment consisted of two P and Fe levels as sufficient and low supply. Control plants were grown at 70% water holding capacity (WHC) while their counterparts were subjected to water stress (35% WHC) at initial flowering stage for two weeks. Considerable variability was observed in leaves, roots, dry mass accumulation among the soybean cultivars (Zodiac, Licurici) at both P and Fe levels in relation to water regimes. The results showed that drought significantly reduced biomass production irrespective of nutrient supply but its adverse effect was more pronounced at low nutrient supply. Leaf development and nodules growth were the most sensitive to water deficit and insufficient nutrient supply. Combined application of P and Fe increased dry matter production and nutrient acquisition for both soybean cultivars. Concentrations of Fe in leaves differed significantly among cultivars at both sufficient and insufficient mineral nutrition. Phosphorus application increased its contents in all vegetative organs, but decreased Fe allocation to the leaves of Licurici. In soil culture conditions our results demonstrated that there was a positive effect of P and Fe adequate nutrition on plant growth and nutrient status. Hence, it was revealed that sufficient P and Fe supply partially alleviates the drought negative effect on performance of soybean plants.

Key words: iron, phosphorus, soybean, water stress

¹ Institute of Genetics and Plant Physiology Chisinau, Republic of Moldova