Application of Sulfur in Calcareous and Saline-Sodic Soils of Khorasan Razavi Province to Enhance Plant Yield

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Abstract

Sulfur is an essential element for plant growth since its presence in betaine, biotein, aminoacid, and sulfulipid compounds plays a key role in activating many enzymes, synthesizing proteins, and counteracting the toxicity of heavy metals in plants. In addition to its nutritional value, sulfur is known as a soil amendment for improving the physico-chemical properties of calcareous, sodic, and saline-sodic soils. Agriculture in Khorasan Razavi Province, as one of the greatest and most important producers across the nation, plays an important role in providing the essential needs, producing food, supplying industrial raw materials, and creating employment for the population in the province. Due to the inadequate physico-chemical conditions, however, the soils in this province are not able to provide (horticultural and farm crop) plants with all their nutritional requirements, especially phosphorous and micronutrients. Although nutrient requirements might be met in the short term through continued use of chemical fertilizers, it will in the long term lead to soil and water pollution. Study has shown that proper use of sulfur in soil can not only improve soil chemical and physical properties but also contribute to better nutrient uptake by plants and prevent the associated environmental problems. Based on these results, application of sulfur, organic matter, and Thiobacillus by 2% the sulfur weight may be recommended for improving both plant yield and soil physico-chemical properties.

Key words: Nutrition, Soil reclamation, Sodic.