Effect of Silicon Sulphate and Silicic Acid Rates on Yield and Quality of Wheat (*Triticum aestivum* L.)

R.G. Shemi

Department of Agronomy, Faculty of Agriculture, Cairo University, Giza 12613, Egypt

M.M. Abbas

Department of Plant Nutrition, National Research Centre, Dokki, Cairo 12622, Egypt

Kh. M. A. Mekled

Department of Agronomy, Faculty of Agriculture, Al-Azhar University, Cairo 11884, Egypt

Abstract:

The utilization of silicon (Si) sources is a crucial agricultural tool that requires optimization to promote sustainable practices. The application of Si provides the implementation of biological mechanisms of plant nutrition, growth promotion, and protection. The objectives of this experiment were to investigate the relative efficacy of Si sources and levels on the growth and yield of wheat. The study examined the effects of silicon sulphate and silicic acid levels on growth, spike characteristics, yield parameters, and macro- and micronutrient concentrations of wheat during the 2-season. The entire above-indicated parameters were significantly ($p < 0.05$) increased with increasing levels of silicon sulphate and silicic acid compared to the control. Foliar applications of silicon sulphate 150 ppm and silicic acid 60 ppm statistically ($p < 0.05$) enhanced grain N concentration and the grain yield by 136.14 and 77.85%, 43.49 and 34.52% in the 1st season, and by 78.62 and 54.40%, 43.53 and 33.18% in the 2nd season, respectively, as compared with control. Overall, foliar applications of silicon sulphate at 150 ppm and silicic acid at 60 ppm were greatly efficient amongst all Si levels and sources in improving growth and spike characters, increasing yield parameters, and elevating grain nutrients. Finally, the treatment of silicon sulfate at 150 ppm was more effective than the treatment of silicic acid at 60 ppm in increasing growth, grain nutrients, and productivity of wheat and attaining agricultural sustainability under experiment conditions.

Keywords:

Wheat, Silicon sulphate, Silicic acid, Grain nutrients.