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Changes in growth, yield, juice quality and biochemical attributes of sugarcane in response to silica granules

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Silicon (Si), the second most abundant element in the earth crust (27.7%) is usually found in the form of complex silicate minerals, and less often as silicon dioxide. It plays an important role in inducing resistance to various biotic and abiotic stresses in plants, helps in controlling Al, Mn and Fe toxicities, increases P availability, reduces lodging and improves rate of photosynthesis by effective use of sunlight as well as efficient management of plant water economy. Sugarcane, a typical Si- accumulating plant is known to absorb a large amount of silica from the soil. A field experiment was conducted to study the effect of Silica granules (obtained from Privi Life Sciences Pvt. Ltd., India) on growth, yield and juice quality attributes of sugarcane at IISR Experimental Farm, Lucknow during 2013-15 (autumn season). The treatments comprised of control (T1), silica granules @ 20 (T2), 40 (T3) and 80 kg/ha (T4), and calcium silicate too high (T5). Specific leaf weight, total dry matter and nitrate reductase activity increased in all treatments relative to control. Silica granules @ 40 kg/ ha (T3) showed highest increase in yield attributes; cane length, girth, NMC and cane yield. °Brix, juice purity, sucrose % juice, juice extraction, CCS per cent juice, S/R ratio and SPS were comparatively higher in treated plants. Highest soluble silica content was observed in T2 (leaf) and T5 (root) treatment. Findings obtained suggested that application of silica granules holds immense potential to improve yield and juice quality attributes of sugar cane.