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Area of work: Forage and pasture

Performance of forage sorghum grown in soil with high magnesium concentration and treated with mineral and organic conditioners

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The salinity and sodicity of soils represented by the terms, salic soil and sodic soil, occur naturally throughout the world and are related to the formation of soil classes, such as Planosols, Neossolos, Vertisols, Gleisols and Cambissos. An important soil formation process (primary, secondary or anthropic), salinization is characterized by an excess of water-soluble salts, mainly chlorides, sulfates and bicarbonates of sodium (Na), calcium (Ca) and magnesium (Mg), and/or exchangeable sodium. This excess of salts in the soil causes different damages to plants, such as osmotic stress, toxicity and reduced production capacity, a common fact in many arid and semi-arid regions of the world). In this environment, the combined effect of Mg and Na causes structural degradation and loss of soil productivity. In this sense, the objective was to evaluate the growth/development of forage sorghum (*Sorghum bicolor* (L.)), grown in soil saturated with Mg and treated with different mineral and organic conditioners. The experiment was conducted in a greenhouse at the Federal University of Agreste de Pernambuco, in a randomized block design, with two cultivation cycles and seven treatments (dairy sludge, gypsum, dairy sludge+gypsum, commercial product, commercial product+gypsum, biochar from chicken litter and control (soil without organic and non-organic remediation). Each treatment with four replications, each replication consisting of a 5 L pot, with 7 kg of soil, containing one sorghum plant per pot. Salinity conditioners were applied at 100% of the recommended dose. The soil used was classified as Planosol and characterized in terms of its concentration of Na and Mg, meeting the criteria for saline soil and saturated in Mg. The plants were evaluated 60 days after emergence, for the variables plant height, number of leaves, leaf green and dry weight, root length, and green, dry weight of the root. The dairy sludge and dairy sludge+gypsum treatments better mitigated the damage caused by excess Mg in the soil, consequently providing the greatest growth/development of sorghum plants in the two evaluation cycles. Both treatments providing minimal increment of 25.81; 160.56; 246.04; 330.96; 11.49; 328.09; and 296.54%, for the variables plant height, number of leaves, green and dry weight of the leaf, root length, and green and dry weight of the root, respectively, compared to the control. The soil salinity conditioners, dairy sludge and dairy sludge+gypsum, were more effective in reducing damage caused by excess Mg in the soil, resulting in greater morphological and productive growth of forage sorghum plants.
Keywords: Soluble salts, productivity, inadequate management.

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