

عنوان مقاله:

Comparing Effects of Treated Rock Phosphate and TSP on Soil P Availability and P Concentration in Apple (*Malus pumila*) Trees

محل انتشار:

دوفصلنامه مزرعه تغذیه دام و فیزیولوژی، دوره 6، شماره 1 (سال: 1389)

تعداد صفحات اصل مقاله: 8

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خلاصه مقاله:

Phosphorus is one of the major elements in plant nutrition and crop productivity, participating in many biochemical processes and translocation of energy. In addition, P is a constituent of cell nucleic acids. Application of phosphate fertilizers is a common practice to correct P-deficiency in plants. For a long time, rock phosphate (RP) has been a major source to P fertilizer production. For evaluation of the efficiency of combined rock phosphate with different constituents, a garden experiment, as a completely randomized block design, was carried out in Torough Station of Agricultural Center of Khorasan with eleven treatments and three replications. Each replication included two apple trees (there should be 11 treatments or 22 apple trees in each replicate row). Treatments were: T1: control (without phosphorous use), T2: Using P as triple super phosphate, T3: 40% concentrated R P. + 40% S (powdered) + 16% cow manure (CM) + 4% zinc sulphate, T4: T3 + 20 grams Thiobacillus sp. inoculant (107 cfu g⁻¹), T5: T3 + 40 grams Thiobacillus sp. inoculant, T6: T3 + Tea residues instead of CM, T7: T4 + Tea residues instead of CM, T8: T5 + Tea residues instead of CM, T9: T3 + plant residue compost instead of CM, T10: T4 + plant residue compost instead of CM, T11: T5 + plant residue compost instead of CM. In all treatments, 1 kg of each fertilizer was used for each apple tree at a 40cm depth. Results indicated that there were significant differences among treatments including concentrated RP + S, Thiobacillus sp. bacteria and CM, with control treatment and treatments with no Thiobacillus from the aspect of available-P and leaves-P concentrations. Based on the results ($P < 0.05$) using of RP + S, Thiobacillus sp. bacteria + CM at a rate of 1 kg.tree⁻¹ for each apple tree had the same effect as triple super phosphate.

کلمات کلیدی:

Thiobacillus, Rock phosphate, Apple, Phosphorus

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