Effect of sulphur on mobility and availability of some nutrients in soil and plant

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Laboratory and pot experiments were carried out to study the effect of the different rates of sulphur S1, S2, S3, (250, 500, 750) ppm S , respectively, and with or without nitrification inhibitor (2 chloro-6-(trichloromethyl) pyridine) at the rate of 15 ppm on availability and mobility of some nutrients as N as urea, P, K, Fe, Mn and Zn in soil and its uptake by wheat plants. In addition to NO3-N content in final of grown period (grains and straw).- Incubation experiments:Alluvial (clay loam)soil was treated with three rtaes of sulphur 250, 500, 750 ppm elemental sulphur with and without 15 ppm N-serve. Nitrogen was added in urea form as 200 ppm for 12 weeks, where soil moisture was maintained at 60 % of the maximum water holding capacity. Each week two reiterated from each treatment was taken for determination soil pH, EC, NH4+, NO3”, S203-2, S204-2 and available P, K, Fe, Mn and Zn.Obtained results can be summarized as follows:1.Treatment of soil with sulphur led to increase soil EC and decrease soil pH and subsequently increasing the availability of P, Fe, Mn and Zn.2.Sulphur play an important role as a nitrification inhibitor, where it increased NH4 / NO3 ratio till about first four weeks of incubation, this effect was correlated with thiosulphate concentration in the soil.3.Sulphur application with the inhibitor was more effective in increasing NH4 / NO3 ratio in soil than sulphur alone.II - Green house experiment:Wheat grains were sown in plastic pots, each contains 5 kg of soil. Wheat plants were thinned to 10 plants per pot. All treatments in the laboratory experiment were repeated except the dose of N, which was increased to 400 ppm as urea, in addition to (25 and 32 ppm) phosphorus and potassium, respectively. Two pots of each treatment were taken monthly during growing period for analysis. The soil in each pot was thin sectioned in three layers and analyzed for soil pH, EC, Nh4 / NO3 ratio, soluble SO4 and available P, K, Fe, Mn and Zn. Total N, P, K, Fe, Mn and Zn were determined in plant samples. At harvest, yield of wheat straw and grains were estimated. By addition to NO3-N content in wheat yield (grains and straw) wasdetermined.The results can be summarized as follows:1.Behavior of soil pH, EC, and available macro-nutrients under the study as affected by sulphur application with or without the inhibitor was similar to that had been founded in laboratory experiment.2.Concentrations of the available nutrients under the study were higher in surface layer comparing to the sub-surface layer.3.Total N, P, K, Fe, Mn and Zn in wheat straw were higher in case of sulphur application with or without the inhibitor comparing to thecontrol.4.Concentrations of total N, P, and Zn were higher in case of sulphur application with the inhibitor comparing to sulphur alone, while the opposite was noticed for total K, Fe and Mn.5.Sulphur play an important role in least of NO3-N content in wheat plants(grains and straw) and that nitrpyrine as nitrification inhibitor.