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Effect of lime on dissolved organic carbon fluxes of two alfisols, in Iran

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Dissolved organic matter (DOM) is an important constituent of soil solution that plays a role in many chemical and biological processes in soils. Tremendous strides have been made in the past 25 years to fully describe the composition of DOM and its role in the soil. Dissolved Organic Carbon (DOC) is one of the important parts of the DOM. Because DOC easily moves in the soil profile, it can reach water resources very quickly and causes water pollution. So, studying DOC fluxes in the soil and the ways to control its movement seems necessary. Many environmental factors such as temperature, moisture, soil solution chemistry ,plant species, microorganisms type, CO2 concentration, pH and soil management practices such as tillage, fertilization and liming affect DON and DIN content in soil samples. Liming, i.e., the application of calcite is the main agro-chemical treatment in low-pH soils that aims at neutralizing acidic inputs and restoring buffering capacity of the soils in many counties such as Iran. The effect of lime, and soil solution chemistry on soil organic matter status and soil biological properties are of importance to agricultural sustainability .Many studies have shown that liming increase pH values in the forest floor within a short time. The increased pH in the forest floor is generally accompanied by a stimulation of biological activity which is regarded as a positive effect, leading to the release of nutrients that were withdrawn from internal cycling in the accumulating humus. An experiment was carried out using a completely randomized design with factorial arrangements (Two soil samples, mainly different in texture, and two levels of liming in six different times) with three replications. At each time the soil units were sacrificed for determining DOC ,pH in soil extracts and soil respiration was measured at these times simultaneously. All treatments were incubated for 60 days at 27 ºC and at the field capacity moisture. The results of this experiment showed that with lime application, DOC content of soil solutions significantly increased in the limed treatment than in the control in both soils during the period of 60 days of incubation. Increasing pattern of DOC values of two soils were similar, however the intensity of lime effect was different, may be because of different soils textures. It seems that mineralization of organic matter increased in both soils and for that reason the amounts of DOC increased. The results also showed that microbial respiration went up in all lime treatments. It is in agreement with the results of mineralization of organic matter.

Keywords: Soil organic matter leaching, Liming, Dissolved organic carbon

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