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CO_2 emissions, organic carbon and nitrogen under conventional tillage in an arid region, Northwest of Mexico

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Conventional tillage systems in the production of agricultural crops often use excessive application of nitrogen fertilizer, which is a source of generation of greenhouse gases (N_2O and CO_2). The information regarding the assessment of greenhouse gases emissions in conventional tillage a system, which is most widely used in the Mexicali Valley, is limited. The aim of this study was to evaluate the CO_2 emission, organic carbon and soil nitrogen related to the application of nitrogen fertilizer in a soil cultivated with wheat under conventional tillage in the Mexicali Valley, Baja California. The experimental plot, with a soil AquicHaplotorrert was cultivated with wheat (*Triticum durum*), with applications of doses of nitrogen fertilizer (0, 200 and 400 kg ha-1). Organic carbon was measured by Walkley & Black method. Soil samples were incubated under 65% of field capacity at a temperature of 30°C. CO_2 emanated from the treatments was measured after 4, 22, 46 and 142 hours of incubation. Nitrogen mineralization (NO_3-) was obtained from KCl extraction and Kjeldahl method. The tendency was described by a lineal function (y = ax + b) and a statistical means trial test was carried out (Tukey a=0.05). Organic carbon values were between 0.87 to 1.02%; no difference was found at different doses. The emission of CO2 was 194, 247 and 238 mg/g/h for doses 0, 200 and 400 Kg N ha-1, respectively, and there was not significantly difference ($p>0.05$) (Table 1). The magnitude of the nitrogen mineralization was 753, 942 and 1125 mg N for doses 0, 200 and 400 Kg N ha-1, respectively, with differences ($p>0.05$) between them (Table 2). Highest doses of nitrogen applied to the soil does not necessarily correspond to a higher emission of CO_2 or organic carbon, but increase ($p<0.05$) the nitrogen mineralization, at least under evaluated conditions.

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