EFFECT OF DIFERENT TILLAGE SYSTEMS ON SOIL PROPERTIES AND PRODUCTION ON WHEAT, MAIZE AND SOYBEAN CROP

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Abstract
Soil tillage systems can be able to influence soil compaction, water dynamics, soil temperature and yield crop. These processes can be expressed as changes of soil microbiological activity, soil respiration and sustainability of agriculture. This work had as objectives: to assess the effects of tillage systems on compaction, temperature, soil moisture and soil respiration as well as establishing the effect of the changes on the production of wheat, maize and soybeans. The study was conducted on an argic-stagnic Faeoziom. Minimum Tillage (MT) and No-Tillage (NT) application reduce or completely eliminate the soil mobilization, due to this, soil is compacted in the first years of application. The degree of compaction is directly related to soil type and its state of degradation. The state of soil compaction diminishes over time, tending toward a specific type of soil density. Soil moisture was higher in NT and MT at the time of sowing and in the early stages of vegetation, then the differences diminishes over time. Moisture determinations show significant differences, statistically insured. MT and NT systems reduce the thermal amplitude in the first 15 cm of soil and increase soil temperature by 0.5-2.20C.Water dynamics and soil temperature showed no differences that could affect crop yields. The determinations confirm the effect of soil tillage system on soil respiration; the daily average is lower at NT (315-1914 mmoli m-2s-1), followed by MT (318-2395 mmoli m-2s-1) and is higher in the Conventional System (CS; 321-2480 mmol m-2s-1). Productions obtained at MT and NT don't have significant differences at wheat and are higher at soybean. The differences in crop yields are recorded at maize and can be a direct consequence of loosening, mineralization and intensive mobilization of soil fertility.

Key words: minimum tillage, no-tillage, soil properties, yield

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