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GREEN CORN DEVELOPMENT AND YIELD WITH DIFFERENT SUMMER SOIL COVERING PLANTS IN A NO-TILLAGE AGRO-ECOLOGICAL SYSTEM

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Abstract

Agro-ecology as a science lays the foundations for the construction of sustainable agriculture and sustainable rural development strategies. In this context, the objective of this study was to evaluate the growth and yield of green corn (*Zea mays* L.) cultivated in a no-tillage agro-ecological system (NTS) with different ground cover plants. The experiment was conducted in the municipality of Domingos Martins, Espírito Santo, Brazil (20° 22' 16.91"S and 41° 03' 41.83" W) in the Agro-ecology Reference Unit (RUA) belonging to Incaper, in five plots with total area of 720 m², with a clayey dystrophic Red Yellow Latosol, which has been under NTS since 2009. It was arranged in a randomized block design, with six replications and five production systems, consisting of three soil covers in the no-tillage agro-ecological system: sun hemp (*Crotalaria juncea* L.); millet (*Pennisetum americanum* L.); and sun hemp/millet intercropping; and two systems without straw and with soil tillage - one agro-ecological and the other conventional. The plots under the organic system were managed according to the principles of agro-ecology, but in some there was soil disturbance before planting for research purposes. On the other hand, the plots in the conventional system were managed according to the techniques widely disseminated and specific to this system. The selected hybrid corn was AG 1051, planted with spacing of 1.00 x 0.20 m. At 23 and 38 days after emergence (DAE), corresponding to the V5 (five developed leaves) and V10 (10 developed leaves) stages, weeding was carried out between the rows of the plots under both systems, according to the observation of visual aspects of the crop and previous practical experiences of the field workers of RUA. At 23, 38 and 79 DAE, respectively, in the V5, V10 and R3 (milky grain) stages, the following evaluations were carried out on ten plants randomly identified in the useful area of each plot: stem diameter and height of the plant from the ground to the insertion of the last completely expanded leaf. Averages were compared using the Tukey test at 5% probability. Evaluations were carried out of stem diameter and plant height, at stages V5, V10 and R3; ear yield with straw and without straw; average weight of 15 ears with straw and without straw; average length and diameter of ears without straw and the percentage of straw. For all agronomic characteristics evaluated, except for length and average diameter of ears without straw and the straw percentage, all the treatments studied were statistically superior to the conventional system. The agronomic characteristic yield, which is the most important among all evaluated, did not show statistical difference among all treatments in the agro-ecological system. Therefore, both the agro-ecological system without straw and with soil tillage, and the agro-ecological systems with straw and without soil tillage using single sun hemp, single millet and sun hemp/millet intercropping can be used with good corn yield.

Keywords

Agro-ecological management, Green manure, Sustainable land use systems, *Zea mays*.