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Effect of green manure in soil quality and nitrogen transfer to cherry tomato in the no tillage system

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The use of alternative fertilizers may reduce costs and promote sustainability to the family-based agro ecological production system. The objective of this study was to quantify the contribution of the green manure to the quality of the soil and the transference of the nitrogen to cherry tomatoes using the N-15 abundance method (FAPESP 11/05648-3). The experiment was carried out in Piracicaba, APTA/SAA, SP, Brazil. The IAC collection accesses 21 of cherry tomatoes were used. Each Plot consisted of six plants spaced 0.5 m and 0.9 m between rows, using a randomized-blocks design with eight treatments and five repetitions. The treatments consisted of green manure crops intercropped or not with cherry tomato, namely: jack bean (Canavalia ensiformis), sunn hemp (Crotalaria juncea L.), velvet bean (Mucuna deeringiana), mung bean (Vigna radiata (L.) Wilczek), white lupine (Lupinus albus L.) and cowpea (Vigna unguiculata (L.) Walp). Besides two witnesses, one with and another without corn straw. Five leaves with petiole of each plant part from the first ripe fruit and a bunch of fruits per plant are harvested. Samples of leaf and fruit were weighed and dried in a forced air oven and its dry weight measured. A subsample was ground in a Wiley mill and brought to the mass spectrometer (ANCA GSL) on the Stable Isotopes Laboratory of CENA/USP for δN-15 analysis. It measured the percentage of the transference of N from the green manure to the tomato; the tomato plants grown in monocropping were considered a control. It was found that 27 % of the N present in the fruit and 23% of the N present in the leaves came from the green manure. These results show that dur¬ing the development of the fruit of the tomato there is a greater translocation and consequently, a higher use of the N from the green manure in the fruits than in the leaves. This production system can reduce the use of nitrogen fertilizers. The presence of a green manure in non-intercropped treatments caused some soil alterations that could be detected in samples collected in the harvesting season. There was an increase in organic matter, Ca, Mg and Zn availability and consequently, in the base saturation and in the pH. The presence of green manure caused a significant increase in the sum of bases, due to increases in calcium and magnesium; consequently, treatments involving jack bean, sunn hemp and mung bean showed higher CEC values and low acidity potential. The presence of organic acids in the plant mass could be the reason for this change. The use of green manure also increases the carbon sequestration, contributing to the reduction of the greenhouse effect.