Mid-term effect of compost amendements on soil fertility and organic greenhouse vegetables production in arid conditions

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The objective of this study is the evaluation of the annual compost amendments with four rates of compost (10 t/ha, 15 t/ha, 20 t/ha and 25 t/ha) on the soil fertility in Souss-Massa region (Morocco). This effect has been studied at four soil depths (30 cm, 50 cm, 70 cm and 90 cm) after five years of compost amendments and five cropping cycles of organic vegetables in the experimental farm of Melk Zhar INRA Agadir. Results showed a decrease in pH level compared to control (4,83% for the rate 25 t/ha at the amended horizon). There was an increase in electrical conductivity of 32 % for the rate of 25 t/ha, 28.1 % for the rate of 15 t/ha for all depths. Obviously, an increase in the Soil Organic Matter content (SOM) has been observed with the highest value of 1.2% for the rate 25 t/ha at the amended horizon. An average increase in the humin fraction (42% of Organic Carbon), followed by fulvic acids (34%) and humic acids (14.5%) for all rates at the amended horizon. Concerning chemical parameters, there were an increase of total nitrogen, available phosphorus, exchangeable cations (magnesium and potassium) and micro-nutrient elements (iron and copper) for all rates of compost and at all depths. The organic vegetables production has been improved by an average of 24% more yield than the control. Consequently, mid-term amendment of compost improve soil fertility and increase the production of organic vegetables in sandy soils under arid conditions.

Keywords: Mid-term amendment, compost, sandy soil, soil fertility, organic vegetables, arid conditions