

Influence of Environment-Friendly Organic Wastes on the Properties of Sandy Soil under Growing Zea mays L. in Arid Regions

Authors : Mohamed Rashad, Mohamed Hafez, Mohamed Emran, Emad Aboukila, Ibrahim Nassar

Abstract : Environment-friendly organic wastes of Brewers' spent grain, a byproduct of the brewing process, have recently used as soil amendment to improve soil fertility and plant production. In this work, treatments of 1% (T1) and 2% (T2) of spent grains, 1% (C1) and 2% (C2) of compost and mix of both sources (C1T1) were used and compared to the control for growing *Zea mays* L. on sandy soil under arid Mediterranean climate. Soils were previously incubated at 65% saturation capacity for a month. The most relevant soil physical and chemical parameters were analysed. Water holding capacity and soil organic matter (OM) increased significantly along the treatments with the highest values in T2. Soil pH decreased along the treatments and the lowest pH was in C1T1. Bicarbonate decreased by 69% in C1T1 comparing to control. Total nitrogen (TN) and available P varied significantly among all treatments and T2, C1T1 and C2 treatments increased 25, 17 and 11 folds in TN and 1.2, 0.6 and 0.3 folds in P, respectively related to control. Available K showed the highest values in C1T1. Soil micronutrients increased significantly along all treatments with the highest values in T2. After corn germination, significant variation was observed in the velocity of germination coefficients (VGC) among all treatments in the order of C1T1>T2>T1>C2>C1>control. The highest records of final germination and germination index were in C1T1 and T2. The spent grains may compensate deficiencies of macro and micronutrients in newly reclaimed sandy soils without adverse effects to sustain crop production with a rider that excessive or continuous use need to be circumvented.

Keywords : corn and squash germination, environmentally friendly organic wastes, soil carbon sequestration, spent grains as soil amendment, water holding capacity

Conference Title : ICAACS 2016 : International Conference on Agriculture, Agronomy and Crop Sciences

Conference Location : Rome, Italy

Conference Dates : September 15-16, 2016