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Determining and Comparing the Quality of Composted Cow Manure, Raw Cow Manure, Cow Manure with Alfalfa and Composted Municipal Solid Waste

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ABSTRACT

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Background and Objective(s): In this study, quality of different manures was evaluated to select the most appropriate agricultural fertilizer.

Materials and Methods: Electrical conductivity, water storage capacity, organic compounds, germination index, C/N ratio, NH_4/NO_3 and heavy metals were measured in composted cow dung, raw cow dung, cow dung with alfalfa (the ratio of 1 to 5 weights) and composted municipal solid waste.

Results: Composted cow dung, raw cow dung, cow dung with alfalfa and composted municipal solid waste had electrical conductivities of 7.05, 7.77, 7.62 and 2.7 dS/m, water storage capacity of 2.64, 3.35, 3.52 and 1.6 ml/gr³, the organic compounds of 48.29, 64.2, 52 and 40.2% and germination indices of 70, 10, 90 and 100%, respectively. Also, the studied manures had the following C/N ratios: 13.71, 15.93, 9.33 and 11.78 and NH_4/NO_3 14.5, 17.42, 35.75 and 9.9, respectively. The highest concentration of heavy metals was in composted municipal solid waste, which were equal to 300.28, 56.7, 9.18, 8.64 and 1100 (mg/kg) and at least was in raw cow manure, which were equal to 16.12, 19.24, 0.75, 0.52, and 520 (mg/kg) for Lead, Nickel, Cadmium, Chrome and Zinc, respectively. It should be noted that the composting process slightly increased heavy metals concentration, but by the addition of alfalfa, the values had decreased.

Conclusion: This study showed that the cow fertilizer with alfalfa had the highest quality among other fertilizers. Also, composted cow manure and composted municipal solid waste were in second priority, but raw cow fertilizer had the lowest quality for agriculture.

KEYWORDS:

Cow manure, Compost, Alfalfa, Municipal solid waste

