

URINE AND COMPOST EFFICIENCY APPLIED TO LETTUCE CULTIVATION UNDER GREENHOUSE CONDITIONS INTEMIXCO, MORELOS, MEXICO

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INTRODUCTION

In the 80's Mexican farmers were looking for new options for cultivation. This gave birth to organic agriculture which has the advantages of costs reduction, health and environmental protection and commercialization of country produce. One of the most profitable cultivations is vegetables owing to its high water content (85%), juicy tissue with high cellulose, vitamin and mineral content and its short vegetative cycle, and also because vegetables are basic for human nutrition. When soils have insufficient nutrients its possible to use solid and liquid manure as source of elements for plant needs such as nitrogen, phosphorus, calcium, magnesium, potassium and sodium.

With the organic method of horticultural production the soil plays a very important part. When it contains a dynamic balance of living organisms like bacteria, fungus, earthworms and large amounts of organic matter the plants develop well with no diseases.

The soil is improved through recycling biomass from cultivation residues, dead coverage, green manure, rotations etc. These techniques allow the production system to develop a permanent coverage of the soil and the recycling of nutrients. It is also important to consider animal manure, urine, and other organic sources. Compost adds a great amount of organic matter and nutrients to the soil to fulfill the plant needs. If the nutrients in urine are not lost by storage and transport its effect is as good as that of chemical fertilizers used in similar amounts. This is due to its large amount of nitrogen and phosphorus in forms that are readily available for the plants.

OBJECTIVE

To evaluate the lettuce development using organic manure.

METHOD

This research was conducted in a 500 sqm (10 m x 50 m) greenhouse on public land in Alta Palmira, Temixco, Morelos, Mexico; located between the 99° 14' 2" and 25° 10' 8" parallels at an altitude of 1,290 meters above sea level. Twelve 5 sqm seed beds were made, on which a trickle irrigation system was installed and they were covered with quilted plastic that keeps the humidity and prevents weed growing. On each seed bed were 16 plants of lettuce (*Lactuca sativa* L.). The experimental design used random blocks with four treatments (urine, urine-compost, compost and proof) and three repetitions. The quantity applied of each fertilizer was 150 kg/N/ha.

In the laboratory the urine pH and the total nitrogen in urine and compost were

determined. The lettuce were bio-mathematically analysed (area of leaves, coverage and fresh weight). The statistical tests were variance analysis and Tukey test.

RESULTS

The best results were obtained with urine: 247.9 cm² of leaf area, 87.4 cm of coverage and 1,233.6 g of fresh weight.

The second best was compost: 157.7 cm², 87.2 cm and 1,001.3 g.

The third was urine-compost: 179.7 cm², 82.6 cm and 905.2 g.

The last was proof: 92.3 cm², 71.1 cm and 334.3 g.

The physical and morphological appearance of the lettuce, such as color, juicy look, stem size and thickness, were used to check the efficiency comparing the fertilizers used. In the case of leaf area a comparison between the compost and combined (urine-compost) treatments showed that the first, in spite of a smaller average leaf area, had better physical and morphological characteristics than the second treatment.

CONCLUSIONS

Human urine used as fertilizer was the best in cultivation of lettuce (*Lactuca sativa* L.) in all the evaluation analyses, owing to the availability of its nutrients which, at the same time, combined with soil humidity, become an optimal environment for the microfauna and the mineralization process. Similar results were obtained on former works with salt-wort, beet and celery (Morales-Oliver et. al. in 1999).

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