

Applicability of using liquid compost through irrigation systems

Bachelorarbeit im Fachgebiet Agrartechnik

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Zusammenfassung

There is currently considerable interest in the composting process due to increased pressures from society to improve the quality of the environment. Applying compost liquid through an irrigation system contribute to a better distribution and makes possible analyze the nutrient transport and their behavior along the soil.

Wide range of varieties of Liquid Compost can be obtained from different primaries in different concentrations that are within reach of the farmer and special features for every need and for soil to improve many of the properties of this, including the behavior of chemical fertilizers.

Balanced and adequate supply of plant nutrients is important in order to achieve a high degree of nutrient utilization by crops, which also results in lower losses. Efficient use of nutrients can only be achieved by considering the whole production system. The nutrition of the plant must be integrated into all aspects of crop management.

The experiments showed a good correlation in all results and were found similar behavior in terms of the amounts of nutrients for the three compost studied.

The experiments showed that the Compost obtained from Am Sande is the most nutritionally poor, was also difficult due the size non homogeneous particles and this becomes in a problem when were needed to design and management for any Irrigation System.

For the Witzhausen Compost Factory was found a better nutrient content, as those came from the same raw material presented similar content in quantity but also in proportion in between the four elements analyzed.

Under conditions of the compost mixture is necessary to have a solid material which present good nutritional characteristics, because once the process of mixing will lose some of those. Is also important to study the physical properties of the compost in particular size particle and as far as possible working with a homogeneous material to facilitate the process of mixing and prevents loss of material in the application.

The number of changes of water due to the practical interpretation until was found a strong increasing in the content, in all cases was achieved no less than six changes and the content of nutrients declined in different ways

Under different mixing particularly high concentrations there is an uneven distribution in the soil to obtained different variations depending on soil conditions which would be necessary to apply the procedure would be affected in the concentration of the mixture finally the method of mixing is going to depend on the concentration of the implemented irrigation the size of the crop to be irrigated and the conditions economics but most important specific conditions of the land.

Implementation of the total mixture of compost (homogenized) to the soil-water, procedure thought for Furrow irrigation systems, even this system would avoid the use of filters would be necessary using machinery to ensure a homogeneous mixture during application

Differences between concentration, 10% and 20%, are just in values, being higher in the highest concentration, 20 %, but with similar behavior.

Mechanical device for mixing due to the solution studied had different sizes of particles and a filtration was too expensive to reach and decantation behavior was quicker as expected,

Is possible to reuse the compost by changing water and still obtain some of the conditions wanted, also when as is well known there mixes more and more strict about quantity of compost used in soil.

In the pR figure is noticeable a low range of change specially for the first 7 changes, between 8 and 7.8, this was also observed in different concentrations then is possible to say that this behavior common for the mix and not specific for the concentration.

It is also important to add that it is necessary to study more conditions to be more specific of the range of applicability. The choice of a suitable extractant for available nutrients is very important because of the different amounts of nutrient measured and the degree of their correlation with crop response.

EC show a different behavior, as was expected, initially the change is remarkable, first 5 measures with change of water had a change from 5 m S/cm to less than 1 m S/cm, in this case it is important to study the needs of the crop and the soil to decide with combination is the most appropriate.

Knowledge of the effects that these chemicals could cause long-term needs of an investigation linked closely to the mechanisms of interaction with the ground, through the use of mathematical models that define the behavior and allow to predict their evolution over time.

Determining hydraulic and chemical transport properties of field soils is a fundamental requirement for managing soil and water resources.

The soil type and the application rate of water, both influence the pattern of water movement in the soil.

Adequate evaluation of field hydraulic and chemical transport properties requires a large number of measurements to reflect spatial and temporal variability. Despite the availability of mathematical analysis and models describing the steady flow of water and transport of chemicals, there have been only a few studies conducted in the field.

Field measurement of soil chemical transport properties has been limited by the time and effort required to describe adequately properties in the heterogeneous field.