شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%

بعض الوثائق الاصلية تالفة

بالرسالة صفحات لم ترد بالاصل

Iron-zinc-organic wastes interactions and their effects on biological nitrogen fixation in newly reclaimed soils

BY

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B.Sc. (Soil Sci.), Fac. of Agric., Ain Shams University, 1984
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ABSTRACT

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Some plant residues namely straw of wheat and faba bean was mixed at different ratios of 2 : 1, 1 : 1 and 1 : 2 by weight, respectively, then received biogas manure and rock phosphate. Each ratio was amended (A) or unamended (C) with some natural materials such as azolla, sulfur and cellulolytic fungi, then both amended and unamended heaps aerobically composted for 60 days. Afterwards, the amended composts received *Bacillus megatherium* and *Azotobacter chroococcum* then all heaps stored for 360 days. The physical, chemical and biological changes occurring during the composting process and storage were evaluated. The composts produced were interacted with different levels of iron and zinc to study their effects on biological nitrogen fixation, growth and nutrients uptake by peanut and wheat plants grown in newly reclaimed soils. Some chemical properties of soil used were also investigated.

Obtained results from monitoring of the composting process showed that physical, chemical and biological changes developed faster in early intervals than the late ones. Temperature inside the compost heaps reached maximum within 2 to 4 days and its values were higher at deep layers of the heaps than near its surface and the temperature declined to reach near the ambient temperature at the end of composting. The bulk density, total-N, soluble-N, available-P, Fe and Zn increased while the organic-C and C/N ratio decreased with progressing the composting process and storage. The changes were greatly affected by the original C/N ratio of raw materials and applied amendments. In addition, the total counts of mesophilic bacteria and actinomycetes showed a little increase at early intervals of composting process, then they gave a high increase till the end

of the process. On the other hand, the total counts of thermophilic microflora, mesophilic fungi and aerobic cellulose decomposers gave a high counts at early intervals, then they declined at the late ones. *Azotobacter* recorded a slight high counts in matured composts, while the acid producing bacteria gave a marked counts.

Obtained results from pot experiments of peanut showed that addition of composts or iron with zinc to sandy or calcareous soils led to significant increase in the nodulation status, dry matter and N, Fe and Zn uptake by peanut plants. Moreover, the combination between composts and those micronutrients gave the highest values of the previous parameters. On the other hand, all the studied parameters of peanut plants recorded the highest values in sandy soil as compared to calcareous one. In addition, application of composts to calcareous or sandy loam soil improved the chemical properties particularly DTPA-extractable Fe and Zn which recorded the highest values when the composts applied in combination with iron and zinc.

Obtained results from pot experiment of wheat showed that inoculation of wheat with *Azorhizobium* or *Bacillus* combined with composts led to increase in nitrogenase activity as compared to uninoculated or inoculated treatments without composts. Moreover, addition of full dose of N fertilizer (100 kg N/fed) combined with iron and zinc or composts plus 50 kg N/fed with iron and zinc significantly increased in the dry matter and N, Fe and Zn uptake by wheat plants. However, the full dose treatment gave the highest values of the previous parameters, but it were not significant with different compost treatments. In addition, application of composts to sandy soil had a slight effect on pH, EC, organic-C, total and soluble-N and C/N ratio, but it led to marked increase in DTPA-extractable Fe and Zn particularly when it interacted with iron and zinc.

Key words: New reclaimed soil, Composts, Biological nitrogen fixation, Micronutrients (iron and zinc), Peanut and wheat plants.

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