Composting at the Agricultural Research and Education Centre Raumberg-Gumpenstein

Project results and current progress

Solid manure composting in agriculture

- Project background
- Project aims, Objectives
- Project structure
- Composting – method and material
- Summary and results

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Project background and introduction

- Preparation and effect of tight manure was worked on already earlier:
  - Implementation techniques were evolved
  - Different methods for the turn over of compost were developed
  - Increase of the value of manure
  - “Thinking in a cycle“
- Intensified research of slurry in the 70‘s and 80‘s
- Revaluation of manure:
  - Promotion of organic agriculture
  - Animal-friendly husbandry (with litter)
  - Exploitation of organic materials (green grass, shrubs, organic waste)

Project aims

- Nutrient balancing for particular manure
- Hazard potential of compost heaps for ground- and surface waters
- Impact of the different methods of manuring on soil and plant yield in grassland and arable land
- Comparative researches of the different amount of manure (LU/ha – intensity of production)

Project structure

Composting/storage of manure

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Quantization and analysis before and after

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Spreading out to the various field trials with different amount of manure (LU/ha)

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Grassland
1,5 and 3,0 GVE/ha
Dr. E.M. Pötsch

Field
2,0 GVE/ha
D.I. W. Hein

Lysimeter
2,0 and 3,0 GVE/ha
Dr. G. Eder

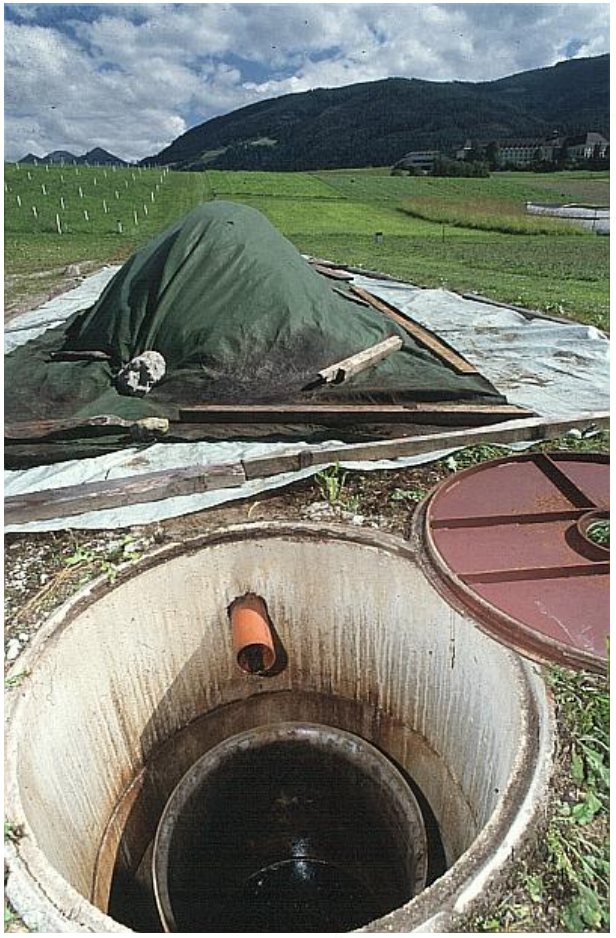
Kind and origin of manure	End product
farmyard manure from a sloped floor system (4,5 kg/LU)	**compost** from a sloped floor system
Manure from tied stall barn (2,0 kg/LU)	**compost**
	stored farmyard manure

Material and methods

- Approx. 7000 kg manure per compost heap
- 1000-3000 kg litter were added to the compost
- Masses were weighed before and after the composting
- Compost heaps were turned over 5-6 times
- Duration of storage and treatment: approx.: 10 weeks

Material and methods

- Autumn and winter round: manure and compost stored another 6 months
- Cover of the compost heaps: air permeable and water-repellent compost fleece
- Sewage water was collected in a 300 litre barrel and analysed afterwards
  (BSB_5, nutrients, pH, conductivity)



Sampling and analysis

Sampling with a sampling pipe or a dung fork

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Mixing of 20-25 litres of trial by hand,
Determining of density from fresh material

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Extracting of 1 litre trial

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DM, ash, N, NH4-N, K, P, Ca, Mg, pH and
some times heavy metals were analysed

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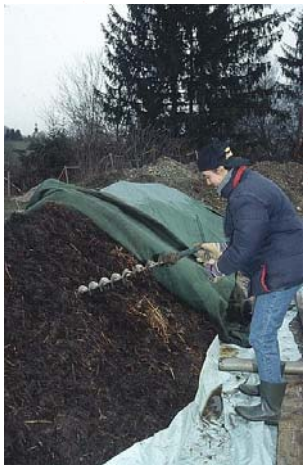
Plant Compatibility



Technique of measurement of the ILT, Boku Vienna

- Measurement of gas concentrations (CO_2, CH_4, N_2O and NH_3)
- Measurement the amount of air – total losses
- Turn over of the compost heaps by hand
- Measurement tunnel was closed backwards with a mesh

Summary and results

- Gathering of a representative trial from tight manure is nearly impossible
- Losses of fresh mass:
  Average: over 55% at composting and 35% at storage
- Nitrogen losses:
  30-35% at composting;
- Nitrogen losses through sewage water:
  0,7-1,7% of the total Nitrogen content, independent of the method
- Ammoniacal nitrogen amount:
  25-30%

Summary and results

- More than 60% of Nitrogen in the sewage water is lost in the first 3-4 weeks
- Gaseous Nitrogen losses are higher at composting than at storage; methane losses are less
- Composting: a labour-intensive procedure for improvement/change of the qualities of manure