THE EFFECT OF COMPOSTS AND COMPOST MATERIALS UPON THE AGGREGATION OF THE SILT AND CLAY PARTICLES OF COLLINGTON SANDY LOAM

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EXPERIMENTAL
MATERIALS AND METHODS

Seven composites consisting of 1,000 pounds (dry weight) of organic materials were set up as follows:

1. Straw (oat) + chemicals, 34 pounds (NH₄Cl) + 12 pounds superphosphate + 30 pounds lime
2. Straw, 700 pounds + clover hay, 300 pounds
3. Sedge and reed peat, 700 pounds + timothy hay, 200 pounds
4. Cow manure, straw bedding
5. Salt grass hay + chemicals as for straw
6. Cornstalks + chemicals as for straw
7. Leaves, + ash, oak, and maple, 700 pounds + clover hay, 300 pounds

The composites were turned, sampled, and re-placed at various intervals of time. The samples, taken at different intervals of composting, together with portions of the original compost materials, were dried, ground, and used for soil aggregation studies. The composting period was considered complete when the temperatures inside the piles failed to rise after the composts were turned and when the nitrogen was from 2.5 to 3.0% on a dry basis.

Collington sandy loam subsoil, consisting of 82.4% sand, 8.7% silt, and 8.9% clay, and having moisture-holding capacity, total organic carbon, and nitrogen content of 42.1, 0.21, and 0.042%, respectively, was selected for aggregation studies. The dried and ground samples of the original compost materials, in the same proportions as existed in the compost, were dried, ground, and used for soil aggregation studies. The composting period was considered complete when the temperatures inside the piles failed to rise after the composts were turned and when the nitrogen was from 2.5 to 3.0% on a dry basis.

Collington sandy loam subsoil, consisting of approximately 75% sand, 25% silt, and 5% clay, was subjected to the composting process. The composites were turned and when the nitrogen content was from 2.5 to 3.0% on a dry basis.

To determine the relative aggregation of the soil particles, the contents of duplicate tumblers from each treatment after incubation for 4 hours and 20, 50, 100, and 200 days were analyzed in the moist and dry states by a method (6). After sampling the moist soil for aggregate analysis, the remaining soil was dried in the oven, and the moisture content was determined. The tumblers were then incubated at 28° C. Water was added to bring the moisture content of each treatment to 55% of saturation. The tumblers were then incubated at 28° C.

The dried and ground samples of the original compost materials, in the same proportions as existed in the compost, were dried, ground, and used for soil aggregation studies. The composting period was considered complete when the nitrogen content was 0.042% on a dry basis.

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