

Information Sheet No. 5-5

Composting Science for Industry

Water

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Importance of water

Moisture, or water, is essential to all living organisms.

The optimum moisture content for composting is generally between 50 and 60%. Below about 30%, microbial activity virtually stops. Moisture contents above 50% are critical for effective pathogen and weed control during the thermophilic stage of composting.

Organic particles are attacked by microorganisms present in a water film surrounding these particles (Figure 1). If water becomes limiting, the water films reduce in size and microorganisms die of water stress. No water, no decomposition!

Moisture is lost during composting by evaporation. This has the benefit of cooling the compost and can prevent overheating and associated reductions in microbial activity.

With *windrows*, water can be added

during turning with a mechanical windrow turner connected to the water supply. Where this is not possible, or where front-end loaders are used for turning, water can be added manually by hose, sprinklers or soaker hoses.

Care must be taken to minimise pooling during watering by providing adequate drainage and water (run-off) collection systems. Pooling

‘Care must be taken to ensure that the compost does not dry out too quickly, because decomposition will cease, resulting in a partly finished compost. This material will rapidly decompose and produce heat when re-wetted. Re-heating in bags can produce odour, and bags can split during handling.’

Figure 1. Decomposition model for solid particles in a composting system. Decomposition is performed by microorganisms present within the liquid film and on the surface of particles. At high moisture contents, the air-filled zone between the particles become filled with water, restricting oxygen movement, leading to the development of anaerobic conditions (Rynk *et al.*, 1992).



