

# **COMPOSTING**

## **Learning Objectives**

*The learner will:*

- Understand the various roles of compost on a farm
- Have a basic understanding of the processes involved in decomposition
- Learn how to make a good compost pile and proper application methods

## **Compost**

- Compost is the action and end result of decomposing organic materials in their raw form turning into a vitally important soil amendment that improves the overall quality and tilth of soil.
- Compost can be produced through the act of decomposing plant matter as well as decomposing animal manure

## **Roles of Compost on a farm**

- Recycles waste material on site
- Adds large amounts of humus to soil
- Increases soil fertility and stabilizes elements such as nitrogen
- Hugely increases biological activity in soil
- Improves soil structure and ability to retain water or create percolation of water through soil
- Creates outlet for potentially harmful excess of raw manure in animal based agriculture
- Compost is a wonderful example of permaculture and alchemy, changing waste material into vitally important materials.

## **Decomposition**

- Two types of decomposition: Aerobic decomposition is the breakdown of raw materials in which oxygen is present. This is the type of decomposition that is relevant for composting. Anaerobic decomposition is the breakdown of raw materials in the absence of oxygen and can be identified by a distinct foul smell and a generally “slimy” feel.
- Organisms involved in aerobic decomposition

## **Bacteria**

- Breakdown of carbonaceous material
- Heat pile by CO<sub>2</sub> respiration
- Actinomycetes bind aggregates in pile through fungal like “gray” growth

## **Fungi**

- Performs more complex decompositional roles such as the breakdown of cellulose
- Binds free particulates together improving overall soil structure
- Breaks down woody particulates in compost pile

## **Macro-organisms**

- These organisms include earthworms, beneficial nematodes, fermentation mites, and springtails.
- Most macro-organisms feed on earlier inhabitants of the compost pile. They’re beneficial in their support of the food chain inside the compost pile.
- They produce castings, which contribute to the overall fertility of the soil.
- They aerate the compost mix, which introduces more oxygen, which in turn helps the pile finish faster and decompose more thoroughly.

## **Components of a good compost pile**

- Carbon to nitrogen ratio is important to overall viability and health of pile. Initial ratio should be approximately 25:1 by weight.
- Moisture in pile should be equivalent to a moist sponge. A good rule of thumb should be the fist crumble test. One should be able to grab a fist full of compost and squeeze it into a ball that holds its form but crumbles under slight pressure.
- Dimensions of the pile are important. Optimal size is 6’x6’x6’. This creates conditions that are most manageable and appropriate for a hot compost pile.
- Optimal temperature should be between 130° F to 150° F. Anything over 150° F can begin to kill beneficial microbes.
- The compost pile should be covered in most conditions. This will prevent excess water from leaching out good nutrients and possibly having negative runoff. It will also retain moisture in times of no rain and excessive heat, cutting down on the need to introduce water to the pile.
- The compost pile should be turned regularly using one of many different available means. Turning the pile redistributes heat, biological activity, and moisture content. Turning a pile can finish compost up to 10 times faster than letting a pile sit unturned.

### **Application of Compost**

- Five to seven tons of compost per acre is a generally acceptable rate of application for field dispersal.
- Intensive garden situations can use up to 10 tons per acre.
- When developing a new garden or field, compost should be integrated into the top 18 inches of soil.
- For a developed field, compost integration should be no deeper than eight inches.
- Compost should be applied in the spring prior to planting, midseason as a amendment side dress, and in fall prior to cover cropping.

### **Assessment/Review**

- Name several roles of compost on the farm.
- What types of organisms help the decomposition process?
- Why is it important to turn a compost pile on a regular basis?