

## ORGANIC SOIL MANAGEMENT

**“Feed the soil, not the plant”** is a mantra of organic farmers. Organic farmers focus on creating fertile soil that is rich in organic matter and teeming with life. Plants take up nutrients from organic matter as it decomposes. The goal is to have nutrients made available at the rate and time they are needed by the plants. Organic farmers protect and provide habitat for soil life; these organisms play a vital role in releasing nutrients from minerals and organic matter for plant use.



Animal manure being composted



## HOW DO FARMERS CARE FOR THE SOIL?

**Adding soil organic matter** provides nutrients and improves soil structure. Organic matter helps soil particles clump together – this protects the **topsoil** (the surface layer of the soil) from being washed or blown away, and creates channels through the soil that improve both the circulation and retention of air and water.<sup>1</sup> Soil organic matter also provides habitat for soil life.

**Growing cover crops** to improve soil fertility while alive and after being incorporated into the soil. These plants are not harvested – just grown for soil improvement. Legume cover crops, such as alfalfa or peas, also called **green manures**, transform nitrogen from the air into a form plants can use. Other cover crops (such as oats and buckwheat) add organic matter, take up soluble nutrients (to reduce nutrient leaching), or reduce soil erosion.

**Covering the soil** with crops, cover crops, **stubble** (unharvested plant material) or **mulch** (e.g., straw) protects topsoil, which is the foundation of soil health. Topsoil contains more nutrients and microorganisms than the rest of the soil. Farmers try to keep the ground covered as much as possible because when bare soil can wash or blow away.

**Rotating crops** in a well-designed sequence keeps the soil covered, adds organic matter, and conserves nutrients. Crops that provide nitrogen (e.g., legumes) are followed by plants that use a lot of nitrogen. Organic farmers often intercrop – planting two crops (or a crop and cover crop) together to make better use of the soil nutrients and cover the soil.

**Reducing tillage** minimizes the potential harm to soil life and structure, but tillage can be used carefully to incorporate green manures, prepare soil for planting and control weeds.



Young purple cabbage plants

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## SOURCES OF NUTRIENTS INCLUDE:

- **Compost** (decomposed organic matter) provides nutrients, stimulates soil life and adds organic matter.
- **Manure** is usually composted before application and must reach at least 55°C for 4 consecutive days<sup>2</sup> to destroy pathogens and weed seeds. If not composted, manure must be incorporated into the soil at least 90-120 days before harvest depending on the crop being grown.<sup>3</sup>
- **Rock powders**, such as limestone, add minerals.

## SOIL TEAMWORK

Much of the work on an organic farm goes on beneath your feet. Abundant and diverse soil life is essential for the success of an organic farm. From microscopic organisms to earthworms, soil life is responsible for providing nutrients to plants, helping control plant diseases, protecting the soil from erosion and improving soil quality.



Earthworms

Earthworms create tunnels that help improve air and water circulation in the soil. Worms and insects recycle nutrients in plant tissues and animal manure through decomposition. Certain bacteria, called **rhizobia**, capture nitrogen from the air and make it available to plants (legumes) – giving farmers free nutrients. **Mycorrhizal fungi** improve the ability of plants to take up water and minerals in the soil.

The soil life helps the crop and, in return, farmers provide habitat for the microorganisms and creatures in the soil. When farmers apply compost or plant a cover crop, they feed the soil life. To protect soil life, farmers keep the soil covered and avoid excessive tillage (working of the soil) and the use of synthetic fertilizers and pesticides.



Clover field