Composting

Transforming Organic Wastes
into
Nutrient-Rich Humus

Organic Matter is:

- Anything that comes from a plant or an animal, such as leaves, cow manure, etc.

Humus is:

- Broken down organic matter (source unrecognizable).
- A spongy brown substance.
- The key to healthy soil.

Humus improves:

- Soil texture
- Water retention
- Aeration
- Nutrient retention and availability

Composting is:

The process of transforming organic wastes into nutrient rich humus though controlled decomposition.

Requirements of Good Compost

- Balance of carbon and nitrogen in the composting materials
- Proper moisture
- Good aeration

Balance of Carbon and Nitrogen

- Is referred to as carbon/nitrogen (C:N) ratio
- Ideal C:N ratio for rapid decomposition is 25:1 to 30:1
- Combine materials to give balanced diet for the microorganisms

Composting Materials

- **Low** C/N ratio = **high** nitrogen content (fresh, green, tender)

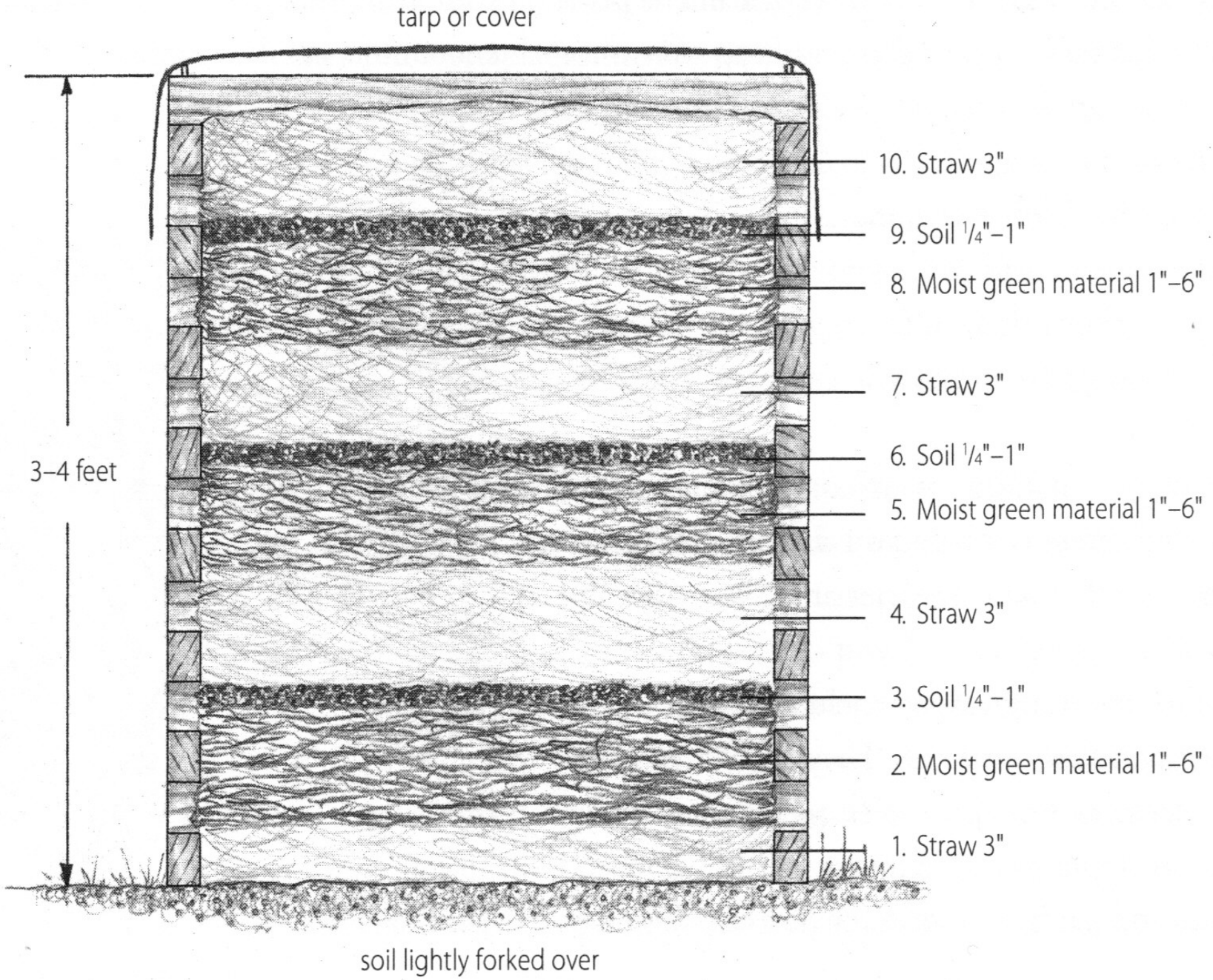
Alfalfa hay	13:1
Clover	15:1
Manure	10-20:1
Grass clippings	15-20:1
Vegetable wastes	12:1

Composting Materials

- **High** C/N ratio = **low** nitrogen content (straw-like, dry, woody)

Straw	80:1
Sawdust	400:1
Leaves	50:1
Dry cornstalks	60:1

Fig. 8



Layers of material in a compost heap.

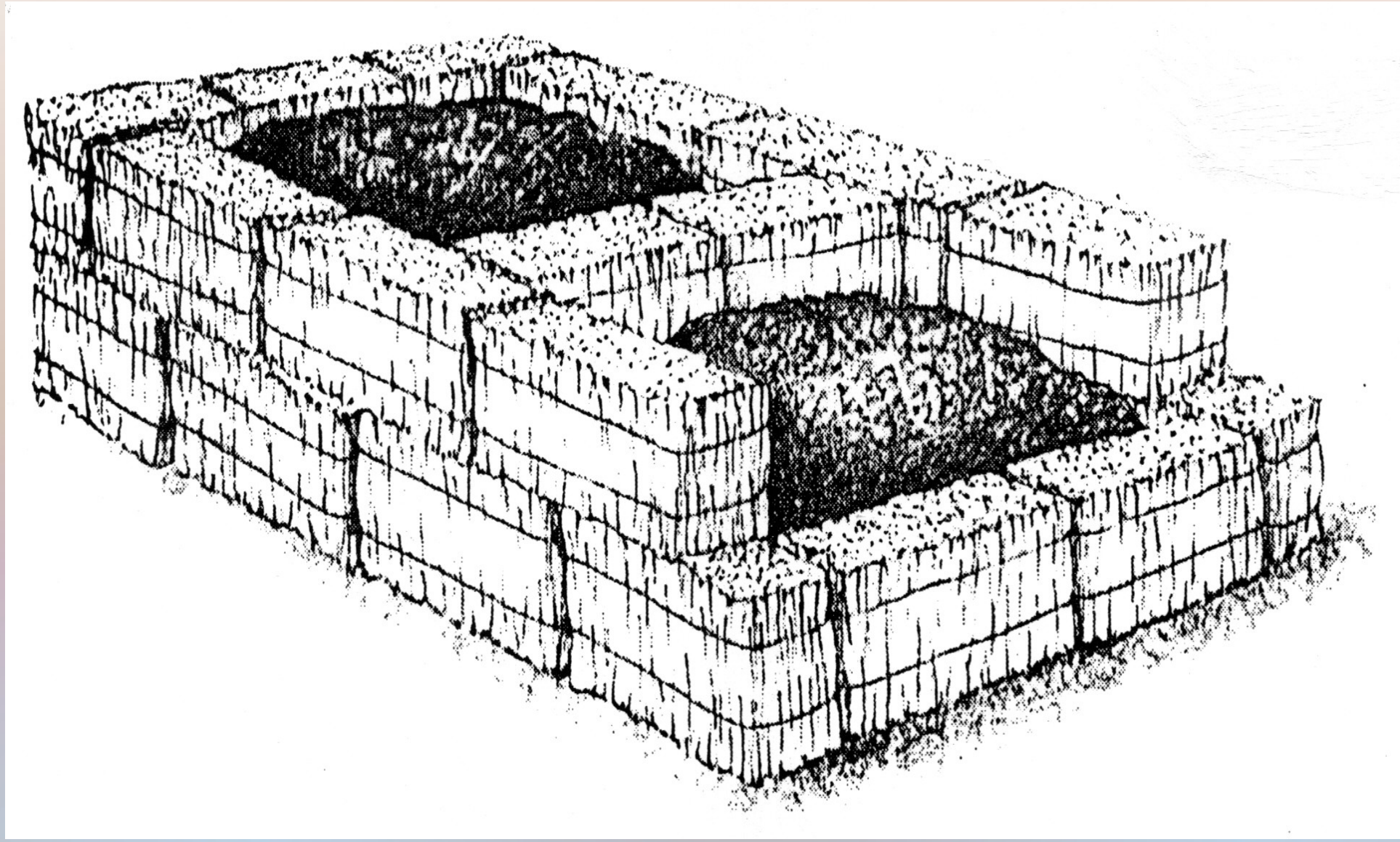
Proper Moisture

- Moist but not soggy wet
- Should feel like a wrung-out dishrag
- Dry materials need to be well soaked as the pile is built.

Good Aeration

- Aerobic decomposition (with oxygen)
- Anaerobic decay (without oxygen)
- Straw-like materials give good aeration
- Turn pile to aerate

Bale Enclosure



Building a Compost Pile

1. Break up the soil under where the pile is to be built.
2. Place up to 1 inch diameter sticks or stalks of sunflowers or okra under the pile to give some aeration under the pile.
3. 3 - 4 inch layer of brown straw-like materials.
4. 1 - 6 inches of high-nitrogen materials such as manure or green matter. 1inch if very high in nitrogen, 6 inches if not so high in nitrogen.
5. (optional) It is ideal to sprinkle garden soil and/or manure or compost between the layers to inoculate the pile with micro organisms. If using soil only sprinkle but do not create a distinct layer. Too much soil can prevent the heating of the pile.
6. If materials are dry, water each layer as you build the pile. If the weather is dry, check the pile weekly to make sure it doesn't get too dry.
7. Repeat steps 3 - 6 until the pile is 3 - 4 feet high.
8. Cover pile with something to protect from sunshine and excessive rain. If it doesn't rain too much, straw or leaves can be used. If it rains more than 2 cm a week, it is good to cover the pile with something that will shed off the rain, like a tarp or tin, etc.
9. Turn pile after each heating phase. After you have built the pile you can push a pointed stick into the center of the pile. After about a week the pile will heat up so much that you can hardly hold on to the part of the stick that was in the center of the pile. When the pile starts to cool down it can be turned, trying to put the material from the outside into the middle of the pile.
10. After you have turned the pile 2 - 3 times, the compost is ready to be applied to the garden. If very fine compost for potting soil is desired, the pile can be allowed to decompose for several more months. It can also be screened through a 1/2 - 1/4 inch square mesh.

READING KINSEY'S CEC SOIL ANALYSIS REPORT

TEC: This the total Cation Exchange Capacity (CEC) based on the clay and humus content of the soil, measured in milliequivalents (ME).
Average range for sandy soils < 8
Average range for heavy soils 15 - 40

pH: 6 - 6.5 If the exchange capacity is balanced, the pH will come into the correct range.

Humus Content: 2.5 - 7.5 %
Below 2.5 % the microbes are on a starvation diet.
Above 7.5 % certain elements will be tied up.

Target base saturation percentages

Calcium: 60 – 70 % (67 - 69 % for clay soil)
(60 % for sandy soil)

Magnesium: 10 - 20 % (10 - 12 % for clay soil)
(15 - 20 % for sandy soil)

Calcium & Magnesium together should equal 80%

Potassium: 2 - 5 % (3 - 5 % for most crops)
(7.5 % for woody plants)

Sodium: 0.5 - 3 %

Other bases (trace elements): variable

Exchangeable hydrogen: 10 - 15 % = pH 6.0 - 6.5

0 % hydrogen = pH 7.0

Anions: These negatively charged nutrients, such as nitrogen, phosphorus, and sulfur, are held in the soil solution and complexed with organic matter and other elements.

Nitrogen: The **E**stimated **N**itrogen **R**elease (ENR Value) is not an actual measurement of the available nitrogen in the soil. It is an estimate of how much nitrogen will be released during the growing season based on the humus content percentage of the soil. A humus content of 5.1 % will give an ENR of 100 lbs./acre. The actual amount of nitrogen released may vary with the soil and weather conditions.

Sulfates: 25+ ppm

Phosphates: Measured as P_2O_5 in lbs./acre

-Minimum: 300 lbs./acre

-Excellent: 500-750 lbs./acre

Trace Elements: Targets for trace elements in ppm:

	Minimum	Excellent	Excess
Boron	0.8	1.0 +	2.0
Iron	100	200 +	
Manganese	40	125	250 +
Copper	2.0	5.0	10.0 +
Zinc	6.0	10.0 +	20.0

Since trace elements are needed in small amounts, great care should be taken when applying individual trace elements to use the correct amounts and to spread the material evenly. It is helpful to mix trace mineral amendments with sand to make spreading small quantities easier.

Sources of Nitrogen (**N**)

- Compost
- Manure
- Legume crops
- Leguminous green manure
- Protein meal

Sources of Phosphorus (**P**)

- Colloidal phosphate 2-3% P available
- Compost
- Manure

Sources of Potassium (**K**)

- Compost
- Granite dust 5% K very slow release
- Greensand 5% K slow release
- Wood ashes
- Potassium sulfate 50 % K

Sources of Calcium

- High calcium lime 39% Ca
- Dolomite lime 21% Ca, 11% Mg
- Gypsum 24% Ca, 17% S

Sources of Magnesium

- Dolomite lime 21% Ca, 11% Mg
- Magnesium sulfate (Epsom salt) 9% Mg

Sources of Trace Elements

- Boron – Borax 11% boron
- Iron - Iron sulfate 21% iron
- Manganese - Manganese sulfate 32% Mn
- Copper – Copper sulfate 25% copper
- Zinc – Zinc sulfate 35% zinc

In-Row Natural Fertilizer Application

- **Alfalfa pellets**, approx. analysis:
  - N (nitrogen) 2.5%,
  - P (phosphorus) 0.5%,
  - K (potassium) 2.0%
- Incorporate into soil under rows at planting time:
  - Average soil 400 lbs./acre (2.5 lbs./100 ft. row)
  - Poor soil 800 lbs./acre (5 lbs./100 ft. row)
- Repeat application as side-dress in about 60 days for crops needing high amounts of N.

In-Row Natural Fertilizer Application

- **Soybean meal**, approx. analysis
  - N 7.0%
  - P 1.5%
  - K 2.3%
- Drill beside row at planting time or when plants are up:
  - Average soil 200 lbs./acre (1.25 lbs./100 ft. row)
  - Poor soil 400 lbs./acre (2.5 lbs./100 ft. row)
- Repeat application as side-dress in about 60 days for crops needing high amounts of N.


TROY-BILT


TROY-BILT
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TOMATOES


TOMATOES