



Compost Application to Croplands (CPS 808)

Part of Fibershed's Carbon Farming Education program, learn more online at: fibershed.org/carbon-farming



Why consider compost on croplands?

- ▶ Compost is a source of energy for the soil ecosystem.
- ▶ Compost is the end product of managed aerobic, high temperature decomposition process of organic matter, suitable for beneficial application to soil.
- ▶ Compost is not a fertilizer; it is a soil amendment with soil fertility and soil quality enhancing characteristics.
- ▶ Compost is a source of both macro and micro nutrients.
- ▶ Compost does not need to be incorporated into the soil to be effective. Tilling compost in will tend to oxidize both compost carbon and soil carbon, resulting in a loss of approximately one half of the applied compost carbon annually. If tillage is required, consider doubling compost rates.



Benefits of Compost Application on Croplands

- ▶ Increases soil organic carbon
- ▶ Improves water infiltration and water holding capacity
- ▶ Improves drainage; reduces flooding and erosion; conserves water by decreasing irrigation demand
- ▶ Reduces bioavailability of heavy metals and soil pollutants
- ▶ Improves soil fertility, nutrient availability and production
- ▶ Reduces the need for synthetic fertilizer / nitrogen inputs to soil
- ▶ Increases microbial activity and beneficial microorganisms, supporting soil ecosystem processes and suppressing root diseases



"Agricultural land management practices can measurably increase rates of carbon sequestration, resulting in enhanced soil quality, soil water holding capacity, increased soil carbon and forage production."

– Ryals and Silver 2013



Compost Application Quantities and Conversions

- ▶ Compost is typically measured by the cubic yard or by the ton.
- ▶ One cubic yard of compost weighs approximately 1,000 lbs ($\frac{1}{2}$ ton), with variation based on moisture content.
- ▶ You may need to convert a measurement of dry weight of compost to wet compost (as purchased from supplier). If so, multiply the dry weight by the quantity (1+moisture content). *For example, if the moisture content is 40%, multiply the desired dry weight by (1.4) to calculate the wet weight of compost you will need.*



How much compost to apply and when

- ▶ Application timing and quantity varies depending on climate, geographic location, soil and crops.
 - In many cases, compost is applied prior to each cropping cycle.
- ▶ Factors to consider to determine timing and rate:
 - Crop nutrient demand; compost nutrient content and availability; baseline organic matter levels on cropland; soil and compost salinity
 - NRCS suggests 5% SOM as an indicator of soil health; ongoing compost applications can reach for this goal.
 - Because organic forms of nutrients, including nitrogen, are less available than synthetic forms, over-application of compost is unlikely.
 - For cropland, there is no ideal application rate for compost. Rate should be based on soil conditions, crop and compost characteristics. Higher rates are common in soil restoration projects.
 - Compost carbon to nitrogen (C/N) ratios vary widely, affecting nutrient availability and organic matter development.



Complementary Practices

- ▶ Nutrient Management (CPS 590)
- ▶ Tillage management (CFP 329/345)
- ▶ Cover Cropping (CPS 340)
- ▶ Conservation Crop Rotation (CPS 328)



Technical Support

- ▶ Resource Conservation District (see CARCD's website directory to find which one serves your area)
- ▶ Natural Resources Conservation Service (see NRCS's service center locator to find which office serves your area)
- ▶ Climate Smart Agriculture Community Agriculture Specialists working across the state with UC Cooperative Extension
- ▶ Community Alliance with Family Farmers (CAFF): caff.org
- ▶ Some regional land trusts may offer technical support services.



Sourcing Compost

- ▶ On-farm produced compost is a great option for producers who have available materials and capacity.
- ▶ Contact Fibershed (hello@fibershed.org) for a list of compost providers in your area.
- ▶ Typical cost per yard: \$20 - \$80 (approx. 1/2 ton). Ask your local RCD or Fibershed for local references.
- ▶ Total cost includes compost material, hauling and spreading.



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