



# Compost Adds Organic Matter to the Soil, Improving Moisture Retention to Combat Drought

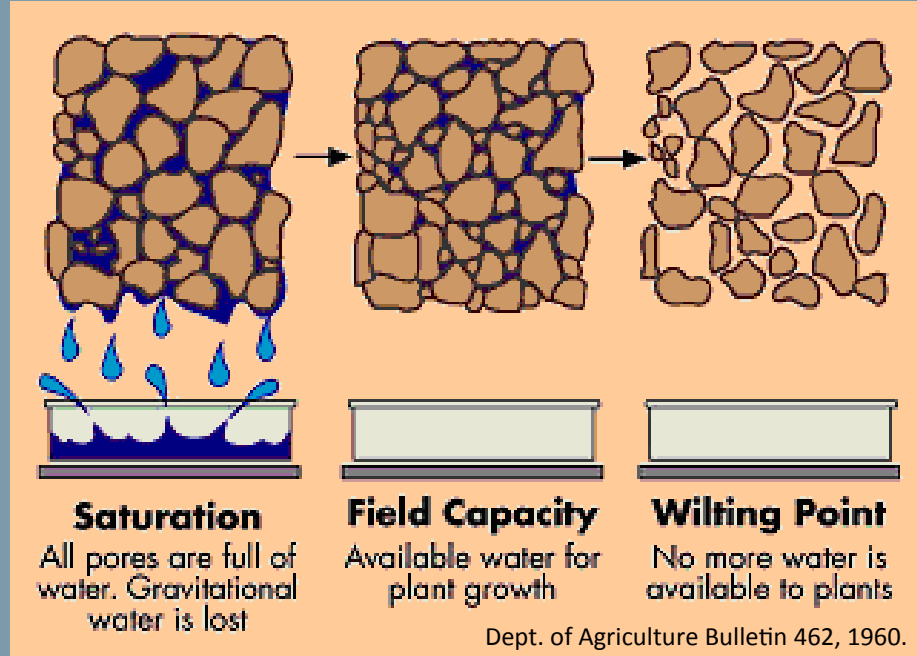
Organic matter comes from once-living plant or animal tissues that are in various stages of decomposition in the soil. Typical agricultural land has 3—6% soil organic matter.<sup>1</sup>

## Benefits of soil organic matter

- Improves water retention
- Enhances aggregate stability, creating pore space for air and water
- Increases nutrient holding capacity
- Increases infiltration and reduces runoff<sup>1</sup>



- For every 1% of organic matter, 16,500 gal/acre of available water can be held in the first 1 ft. of soil!<sup>3</sup>



### Soil Water Holding Capacity

Organic matter provides the “glue” that holds soil aggregates together, creating pore spaces and surface area to hold water in the soil.<sup>4</sup>

Long-term research using biosolids on dryland wheat in eastern WA, increased soil OM from 1.5 to 3% and water holding capacity by 10%.<sup>4</sup> (Biocycle, Sally Brown, Mar. 2014)

## What practices build soil organic matter (OM)?

- Compost
- Cover cropping
- Crop rotation
- Reduced tillage<sup>2</sup>



## Local compost increases soil OM, WSU Compost Outreach Project

With this year’s low rainfall in mind, 53% of farmer participants in the 2015 Compost Demonstration Trials, (23/43 survey respondents) anticipate that compost will help with water retention.



Brad Halm and Ethan Bahe of Seattle Urban Farm Company in Redmond, WA. March 2015

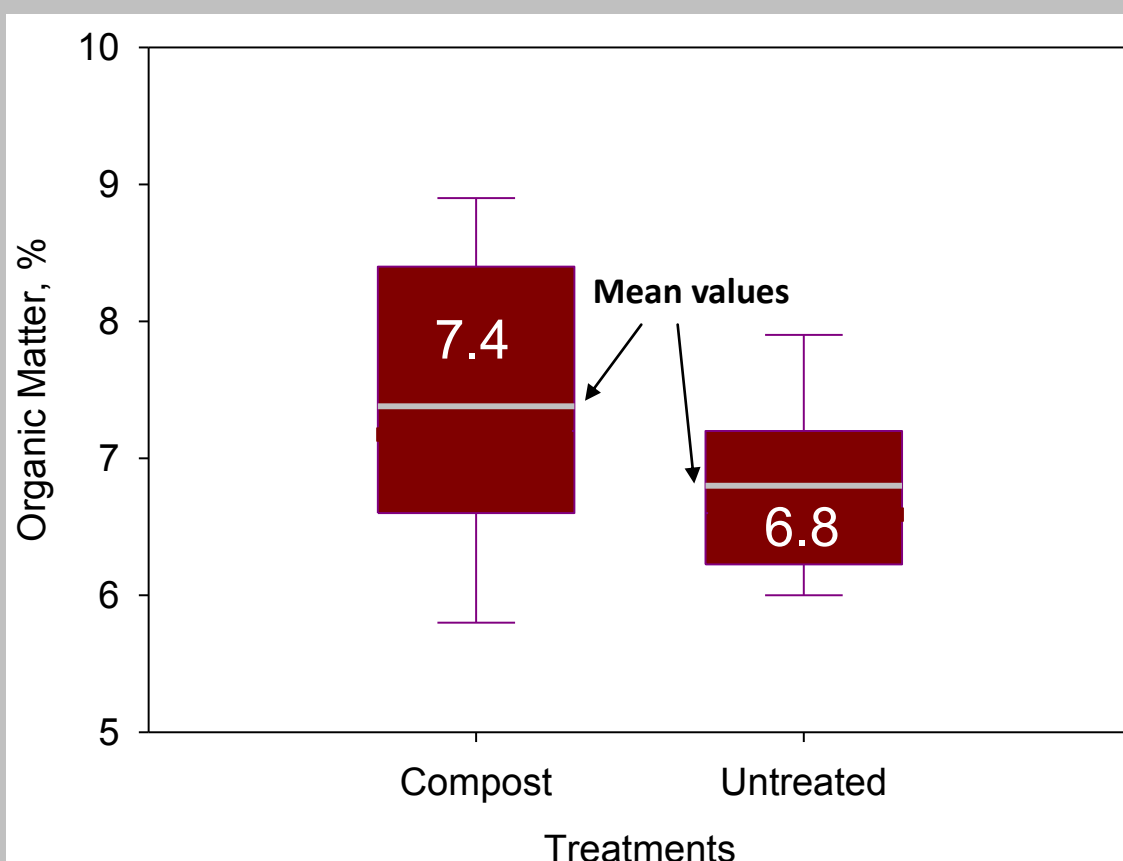
*“[The compost] improved water retention during the summer and porosity during the winter.”*

- Ethan Bahe, Seattle Urban Farm Company

## Compost applied for three years at Carleton Farm, shows trend of increased soil OM.

### Soil OM at Carleton Farm Compost Research Trial

Three compost applications over four yrs.



Line in each box plot represents the mean value. (Whiskers are the 90<sup>th</sup> and 10<sup>th</sup> percentile).

\*Values are not significantly different but trend towards increased OM in Compost treatment.

Commercial compost applied each year (2011-2013), 15-25 dry tons/acre.



### Sources:

- 1: Soil Organic Matter. Agronomy Fact Sheet Series, Cornell University Extension. Fact Sheet 41. 2008
- 2: The Importance of Soil Organic Matter, FAO 2005. <http://www.fao.org/docrep/009/a0100e/a0100e07.htm#bm07.1>
- 3: Gould, Charles. 2012. [http://msue.anr.msu.edu/news/compost\\_increases\\_the\\_water\\_holding\\_capacity\\_of\\_droughty\\_soils](http://msue.anr.msu.edu/news/compost_increases_the_water_holding_capacity_of_droughty_soils)
- 4: Compost and Mulch Aid Drought Survival. Sally Brown. Biocycle March 2014, EPA <http://www.epa.gov/reg3wcmd/composting/CompostMulchandDroughtSurvival.pdf>
- 5: Soil Organic Matter. Soil Quality Kit—Guides for Educators. NRCS. [http://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs142p2\\_053264.pdf](http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_053264.pdf)