

Compost Use in Agriculture, Research and Demonstration Project

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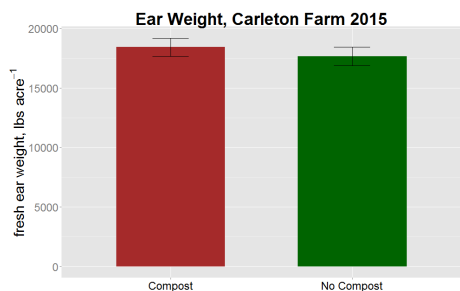
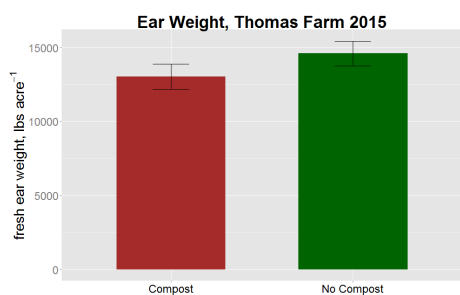
This program is available to local farmers with funding from the Washington State Department of Agriculture, and Snohomish & King Counties, and through a cooperative partnership of WSU Snohomish County Extension, Snohomish Conservation District, King Conservation District, Waste Management, local farmers, and local compost producers Cedar Grove Composting, Lenz Enterprises, and Bailey Compost.

November 2015

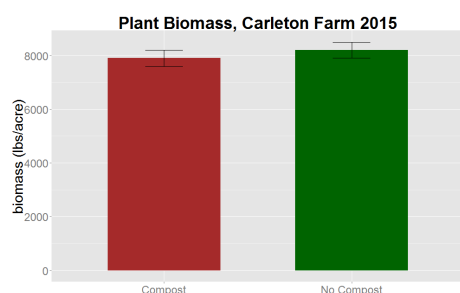
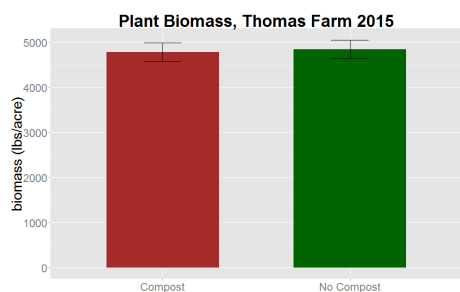


Researchers talk with farmer Reid Carleton.

2015 Research Results: Corn Ear Weight (lbs/acre)



Plant Biomass (lbs/acre)



Soil bulk density improved at Thomas Family Farm with one-time commercial compost application.

The 2015 WSDA-funded Compost Research Trials took place under the direction of researchers Doug Collins, Small Farms Extension Specialist and Andy Bary, Research Assistant, from WSU Puyallup. Collaborating farms were Thomas Family Farm in Snohomish and Carleton Farm in Lake Stevens.

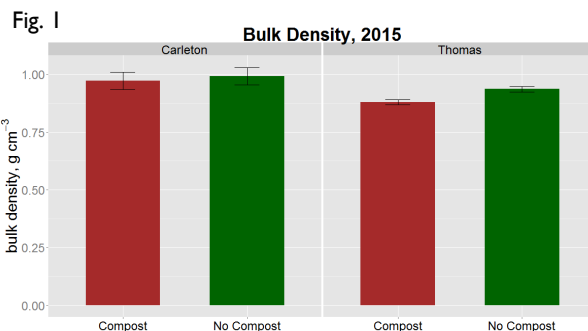
In addition to crop yield, several soil quality indicators were measured including soil samples (analyzed for nitrate), water infiltration, and soil bulk density (BD).

Bulk density (weight/volume) is a measure of soil compaction. Practices that improve soil structure such as cover cropping, reduced tillage, or organic matter application, can reduce soil bulk density.

While Carleton Farm saw no significant differences in bulk density between treatments, at Thomas Farm BD was reduced by 6% with a single application of compost (Figure 1).



Doug Collins samples soil cores at Thomas Farm to measure bulk density.



2015 Sweet Corn Research Trials:

The 2015 research trials evaluated whether the compost is providing nutrients or physical changes to the soil, and whether a measured response in crop yield is due to nitrogen availability or compost.

- **Sweet Corn:** Carleton Farm, Lake Stevens: Compost applied at a rate of ~7.8 dry tons/acre in new research plot.
- **Sweet Corn:** Thomas Family Farm, Snohomish. Compost applied at a rate of ~8.6 dry tons/acre.

Results were surprising, indicating that the crop did not respond to fertilizer or Nitrogen treatments. No significant results on yield or ear weight were observed. It is speculated that at Thomas Farm, a field 'edge effect' obscured treatment differences. Also, both sites had increased variability from a more than adequate supply of plant available nitrogen so there was no response to added nitrogen or compost.

Demonstration Trials:

Nordmann Christmas Trees:



Farmers using compost on Christmas trees and nursery trees have reported improved tree growth and health, as well as increased soil water retention when applying compost as a mulch.

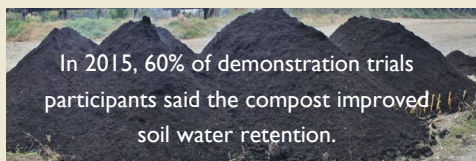
Compost, Organic Matter, and Soil Moisture Retention



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

- Compost is 50-60% organic matter.
- 100 tons of organic material/acre (~200 tons of compost) is needed to add 1% soil OM in top 6" of soil.

Resources:
 • "Compost increases the water holding capacity of droughty soils". Gould, 2015. Michigan State University Extension.
 • Soil Organic Matter. Soil Quality Kit- Guides for Educators. NRCS. USDA.



In 2015, 60% of demonstration trials participants said the compost improved soil water retention.

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- 49 trials in 2015
- Farmers receive a donated ~50 cu. yd. load and apply it alongside a control plot
- 2015 crops: sweet corn, field corn, grass hay, pasture, mixed vegetables, berries, tomatoes, radishes, pumpkins, herbs, nursery trees, Christmas trees, salad greens, cut flowers, hazelnuts, and brassicas.

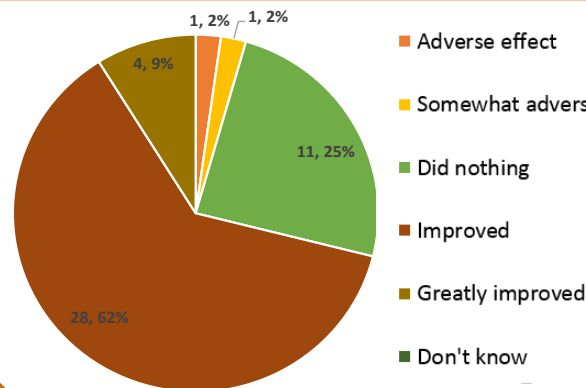
Caruso Farm, Sweet Pepper Trial



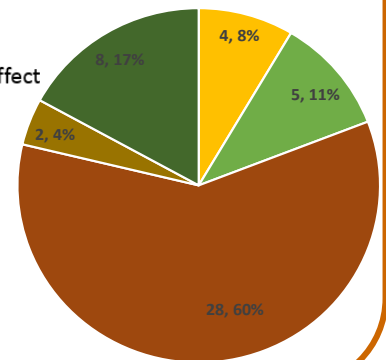
2015 Farmer Observations:

n=47 crops (37 farmers)

Effect of compost on crop production:



Effect of compost on soil quality:



Lessons learned from farmer correspondence and surveys:

- Compost delivered in the off-season (late summer/early fall), then covered with a tarp for use in the following spring can reduce the cost of compost delivery, a savings that can be passed on to the farmers.
- Plastics and other inert contaminants in commercial compost is an ongoing problem, with you-pick farmers experiencing unsightly conditions in their fields with compost applied.
- In 2015, nine participating farmers reported purchasing additional loads of commercial compost outside of the program.
- In a recent survey 62 % (23 out of 37 farmers) reported that they are motivated to continue using compost. Consistent with previous years, several farmers said that a lower price would motivate them to use compost along with spreading equipment, more significant crop response, and information.

