



BioCompleteTM Compost

Lecture 5 – Thermophilic Composting (Part 3)

Large Scale Commercial BioComplete™ Compost

Not really different from small scale, except large shovels --- tractors with frontend loaders -- and large pitchforks, called turners, are used.

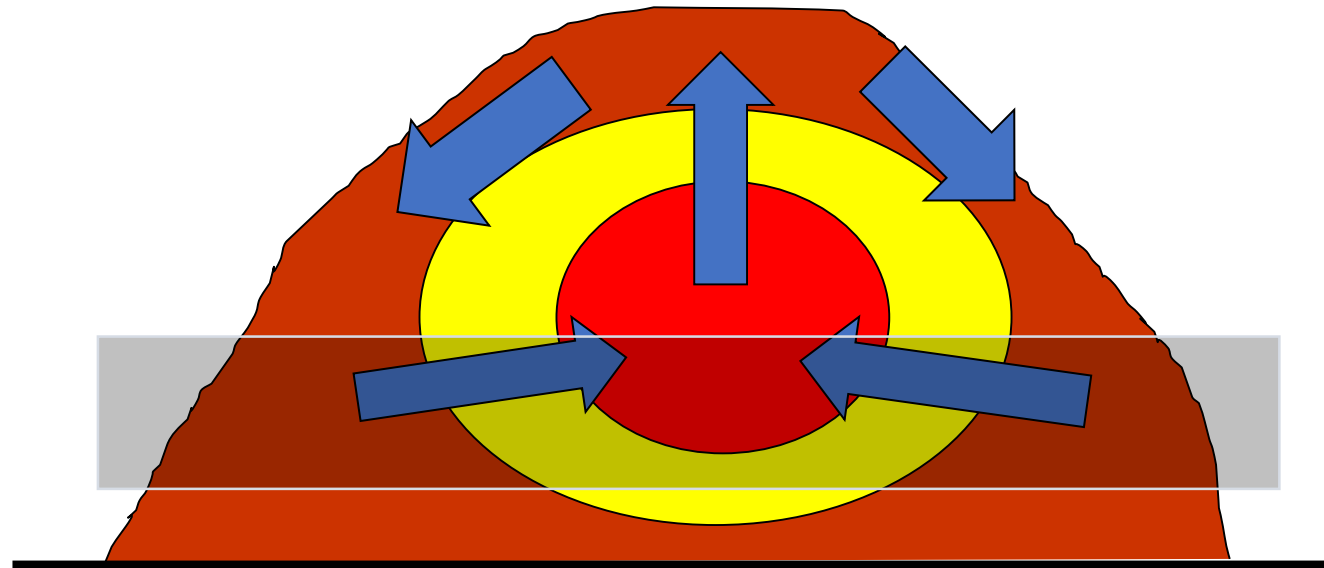
Turners have angled teeth attached to cylinders that turn, so the BioComplete™ Compost is pulled from the sides to the middle, the middle is thrown up into the air and the sides slip down from the top of the pile to the sides.



Turning BioComplete™ Compost by Turner

- **Outside layer needs to move to center**
- **Center moves to outside top**

ALL the
BioComplete™
Compost
eventually gets
into the center
after 2 turns





Anaerobic!
Actinobacteria
Black color
Stink



Biological Farming Technology 130,000 Tonne Annual Composting Facility



Windrow turner used at Rodale Institute - over the row, PTO-driven, water tank





Large Scale BioComplete™ Composting

**Easier in many ways than hand-turned piles.
Machines do the work.**

Surface area is less in a windrow so exposure to ambient conditions is lower, which means temperature and moisture are easier to maintain.

Instead of chimneys in the windrow (too much work), use the tractor to open furrows lengthwise down the windrow to cool and aerate.



Things to Think About

Organisms:

- Additional inoculum
- Wood chip piles and fungal inocula
- Add compost tea

Indicators of when to Turn:

- Temperature
- Moisture
- Anaerobic smells
- Actinobacteria ashy layer

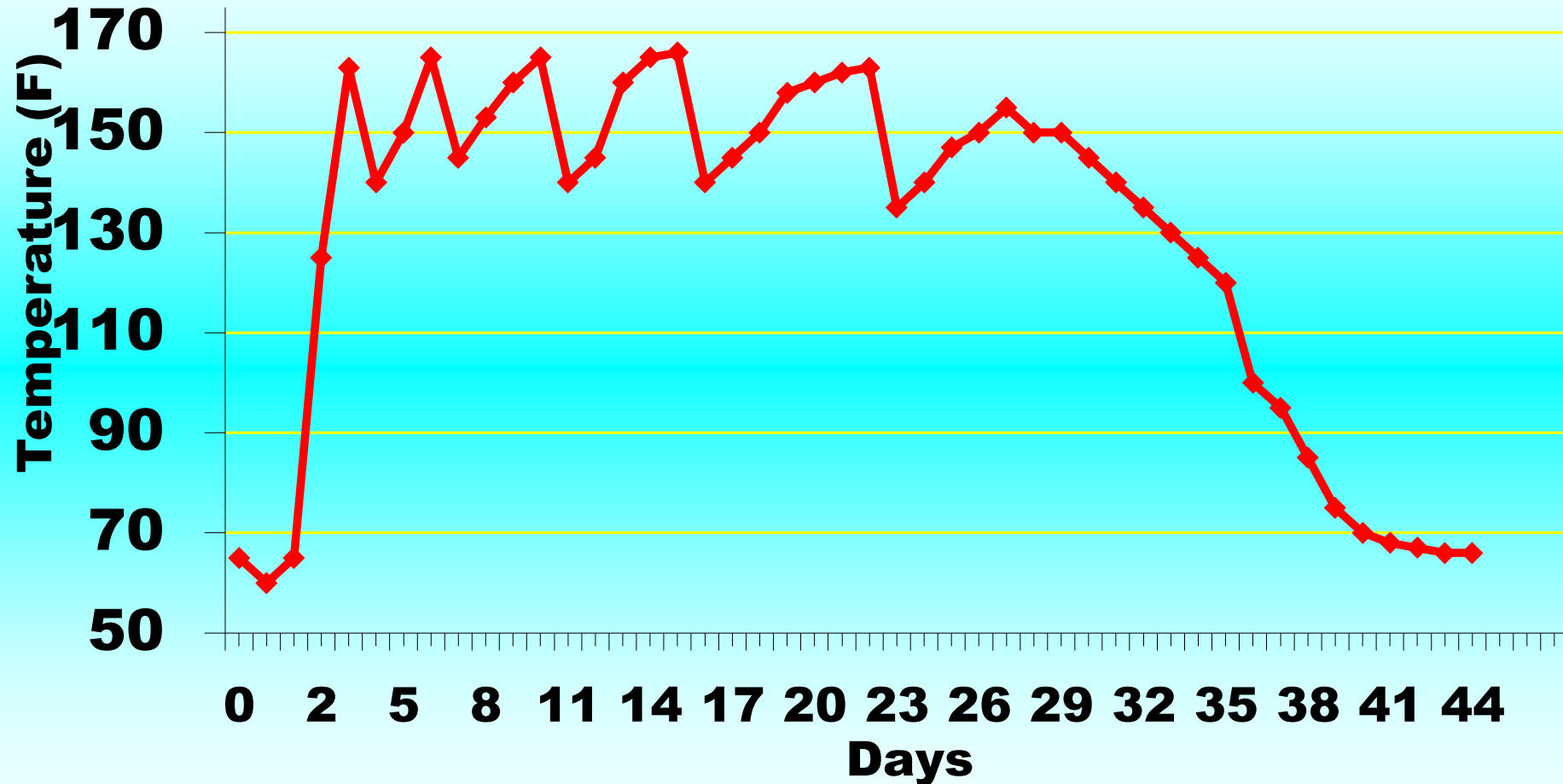
Water: Chlorine? Chloramine?

Covers

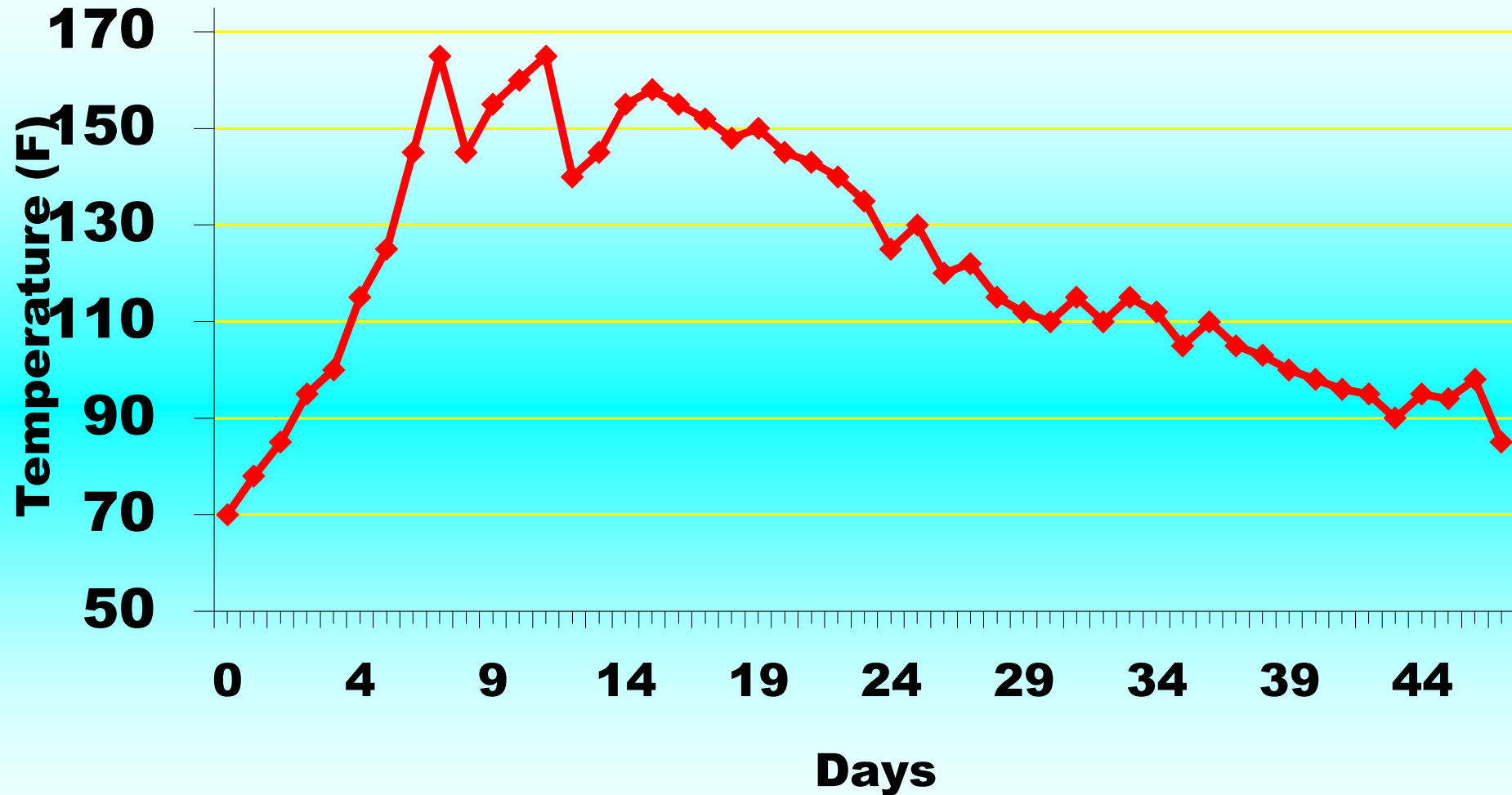
Spreading: manure spreader, broadcast, snow blower, blower trucks

Thermal Compost: 25% high N, 30% green, 45% woody

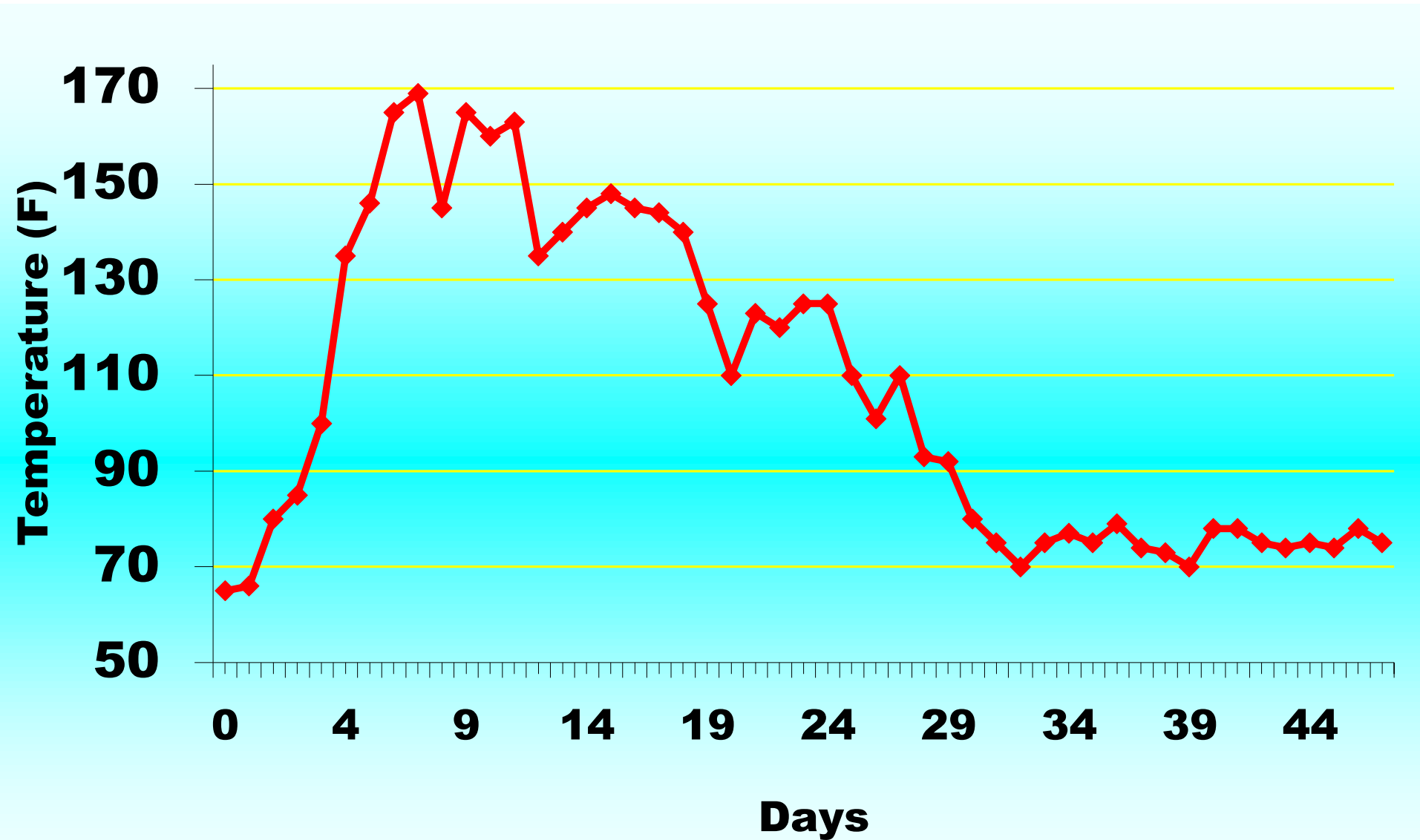
Turned 5 times while temperatures above 131 F, 50% moisture



Thermal Compost: 10% high N, 30% green, 60% woody
Turned 2 times while temperatures above 131 F. 50% moisture



Same recipe, but furrows opened in mid- windrow



Doesn't Heat Kill the Good Guys Too?

- **Human pathogens don't survive high temperatures.**
- **Beneficials appear to have effective resistant stages --- building aggregates to protect themselves, different types of spores and cysts.**
- **As long as temperature doesn't get too hot too fast, the good guys survive.**



Does A Temperature of 170 or Higher Mean the Compost is Sterile?

- **Scientific papers suggest that compost is sterile when temperatures reach 170 F.**
- **Is that true?**
- **Think it through.....What causes heat in a compost pile?**
- **Compost can't be sterile if organisms are growing and producing heat.**

How Do You Know When BioComplete™ Compost is “Done” = Mature BioComplete™ Compost

- **Does not heat up after turning the pile.**
- **Has a healthy food web:**
 - Balance of the organisms depends on desired crop.
 - Nutrient retention balanced by nutrients being made available to plants.
- **Diversity maximum - 6 months versus 2 years (Stable).**

How to Store BioComplete™ Compost

- **Cover!!!!**
- **Not too wet, or too dry**
 - **Oxygen can't move through water**
 - **Too dry, organisms become dormant**
 - **30% moisture is good**
- **Maintain organisms**
- **Good air flow**
- **Compost left too long is top soil**





Anaerobic pockets
and actinobacteria

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FUZZY growth = probable disease fungus



FUZZY growth suggests probable disease fungus

Used by permission, Katelyn Detweiler





