Continuous Aerated Windrow Composting

TRANSFORM
Compost Systems

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Continuous Aerated Windrow Composting

- 26 ft wide by 10 ft high windrows
- Forced aeration

Continuous Aerated Windrow Composting

- Turned 2-3 times per week
- Raw material in one end, compost comes out the other end

How Do We Deal with Organic Waste Diversion From Very Large Cities?

- some cities have 5000 tonnes + per day of organic waste!

Four Main Composting Technologies

- Turned windrow composting
  - Turning, no forced aeration, batch process
- Aerated static pile composting
  - Forced aeration, no turning, batch process
- Agitated channel composting
  - Forced aeration, turning, continuous process
- Mass bed composting
  - Turning, continuous process, aeration?

Turned Windrow Composting

- Makes high quality compost because of the turning and size reduction
- Most suited to outdoor processing
- Batch process, doesn’t account for shrinkage during composting

Aerated Static Pile Composting

Speeds up the composting process through forced aeration

Can accommodate large piles or windrows, covered or uncovered

Needs good porosity to prevent preferential air pathways

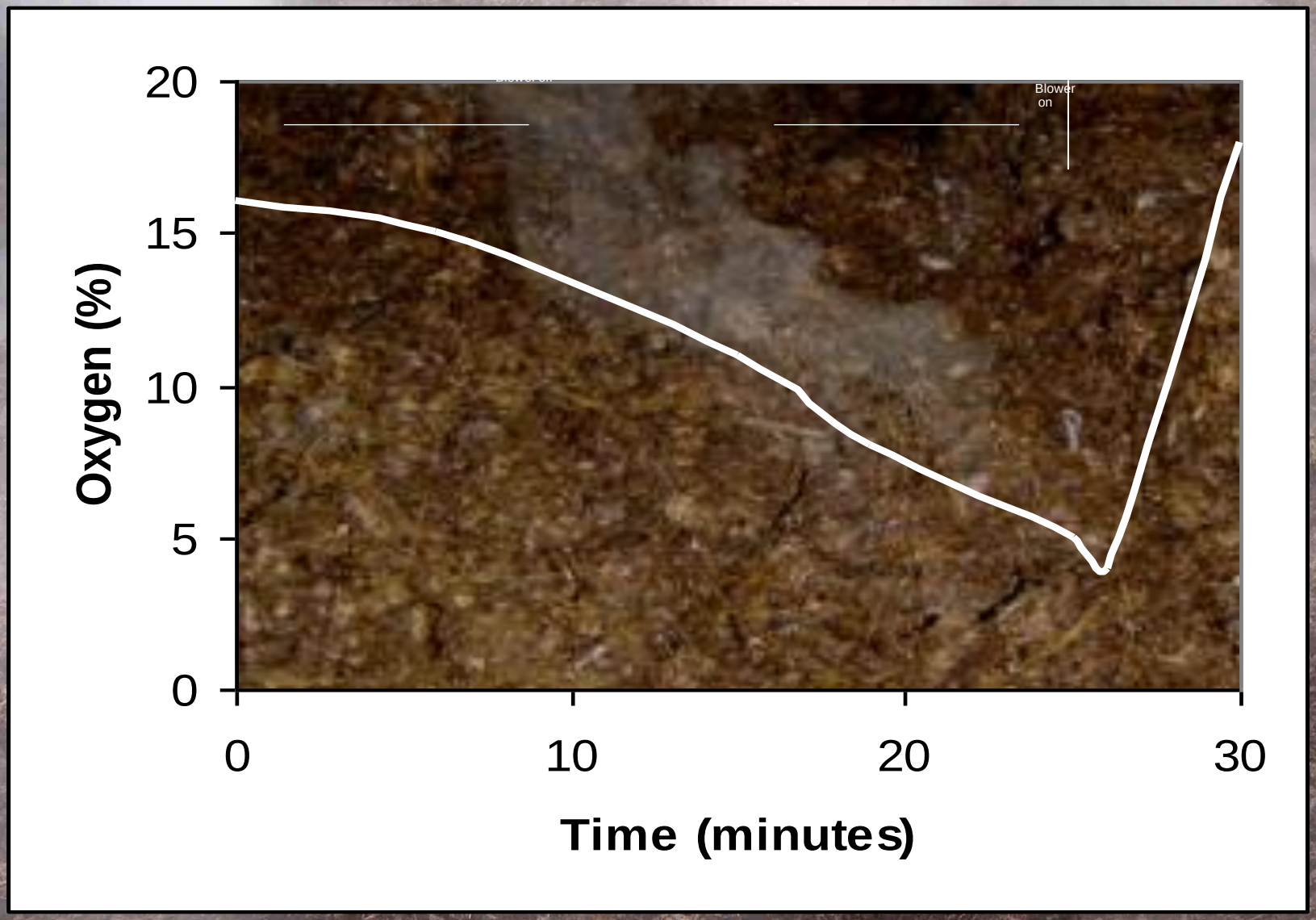
Batch process, doesn’t account for shrinkage during composting

Agitated Channel Composting

- Turning and aeration produces high quality compost
- The continuous flow design combines material flow with the composting process
- Higher capital cost because of the concrete walls and specialized turning equipment on the walls

Mass Bed Composting

- The continuous flow design combines material flow with the composting process
- Can be combined with aeration to produce high quality product in a shorter time period
- Requires a very wide building if under a roof



Aeration is important for speeding up the composting process because oxygen can get used up in a pile or windrow very quickly

Turning Compost is Important

	Sample 1 (bin center)	Sample 2 (bin center)	Sample 3 (composite sample of 4 subsamples 6” from edge
Moisture (%)	37.2	35.7	37.2
Total coliforms (MPN/g)	20	75	20,000
Escherichia coli (MPN/g)	<3	<3	2,400

Turning is important for speeding up the composting process because it breaks preferential air pathways, and brings the material from the outside to the center for pathogen kill.

Turning compost in aerated static systems can get tiring after a while….

We are already seeing adaptations of aerated and turned composting processes

- Peel County, Ontario uses a covered aerated static windrow design, and is using a windrow turner so that they don't have to move the windrows with a loader

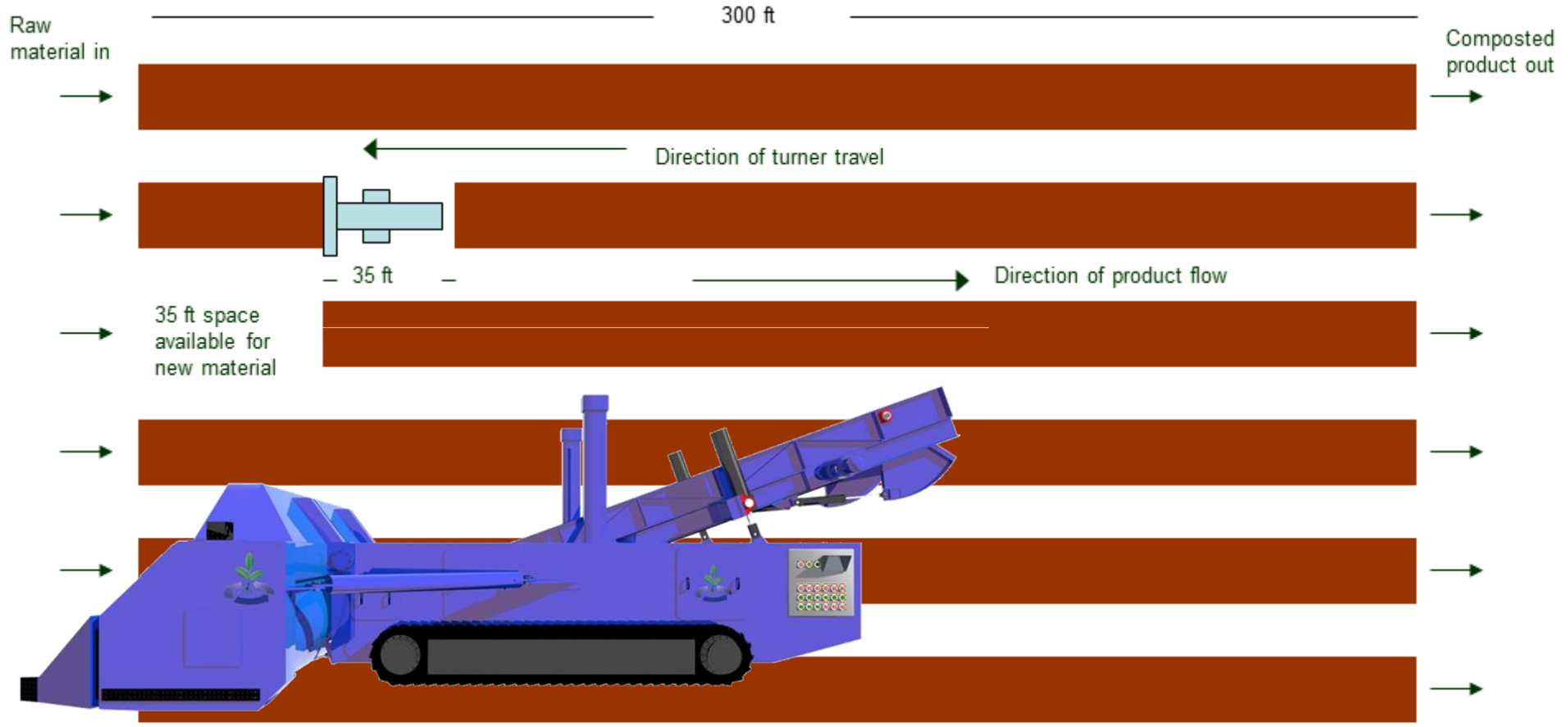
We are already seeing adaptations of aerated and turned composting processes

- Central Valley Wastewater Facility in Salt Lake City uses a covered aerated static windrow design, and is using a windrow turner so that they don't have to move the windrows with a loader

Can We Combine the Best of Composting Technology in One Process?

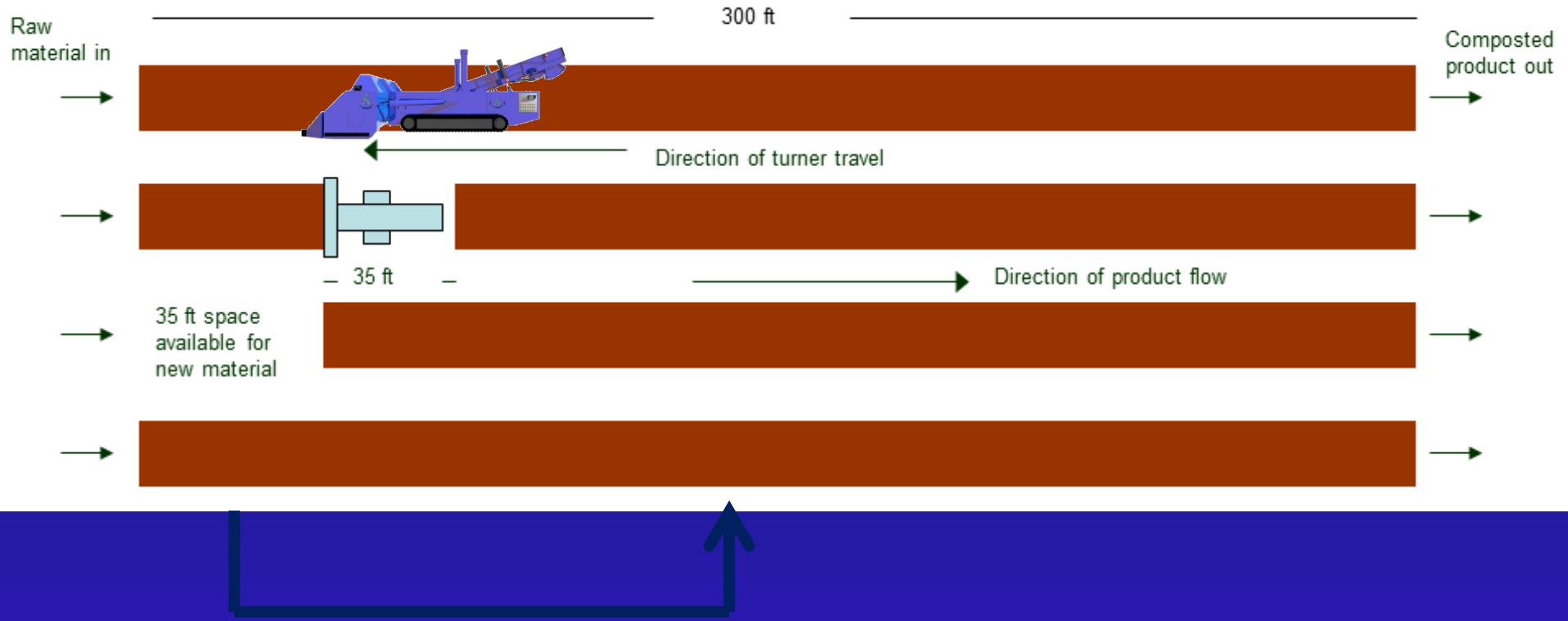
- A combination of turning and aeration
  - allows us to process material with a higher bulk density and moisture content than technologies with either turning or aeration
- Raw material in, composted product out
  - Allows us to use the composting process as part of the material handling process
- Accommodates for product shrinkage during composting
  - Allows us to save space if we can maintain windrow or pile dimensions during the composting process
- Can be processed in lower cost buildings
  - Allows us to use lower cost, corrosion resistant buildings for full enclosure and odor control where required

Continuous Flow Aerated Windrow Composting Technology



It becomes a cost effective composting process that optimizes the use of space, and optimizes the process using aeration and turning – process time up to 8 weeks.

Continuous Flow Aerated Windrow Composting Technology



Higher moisture content material?

Catch the leachate at the beginning, and put it back in after 3-4 weeks.

Still have time for pathogen kill in the process

Inexpensive corrosion resistant structures can be used

Individual 30 ft wide structures can be used to cover the 26 ft wide windrows. A 15 ft height is adequate.

Operator Health and Safety with Composting in a Building

Turner has to be remotely controlled for operator health and safety

- visibility
- gases

Product Shrinkage During Composting

Composting will result in 30-50% volume loss during the process

Odor Control

Odor control can be easily achieved using a biofilter

- headspace is small in composting area
- there are no operators in this space

We Can Combine the Best of Composting Technologies in One Process!

- A combination of turning and aeration
- Raw material in, composted product out
- Accommodates for product shrinkage during composting
- Can be processed in lower cost buildings
- Not as many loaders required to move product
- Operators are not in composting environment