

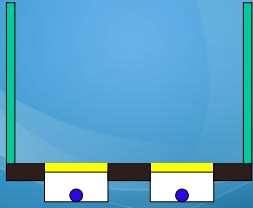
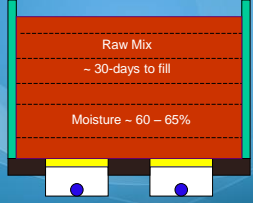
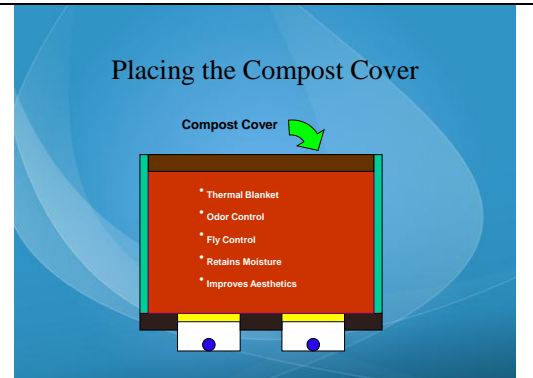


How Do I Operate My O₂Compost System?

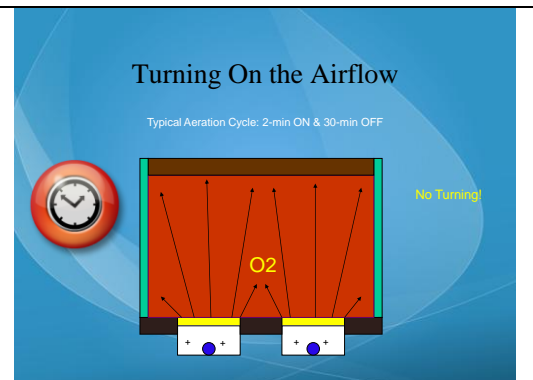
The following series of photographs illustrates how to fill an O₂Compost Bin and how to operate the system as a batch flow-through process. The objective is to keep it simple and systematic.

<ul style="list-style-type: none"> • The O₂Compost system shown to the right has been in continuous operation since 2008. It processes the manure from 16 horses. • This is a top-down system, meaning that the manure is delivered from behind and above and removed from in front and below. • Since this photo was taken, the bins have been expanded to 6-feet tall and each has a capacity of approximately 20 cubic yards. 	<p>3-Bin Top Down Compost System</p>  <p>Liberty Bell Farm, Snohomish</p>
<ul style="list-style-type: none"> • The airflow is delivered to the three bins from a single blower (see photo above). • The direction and volume of airflow is controlled by three “push-pull” gate valves. • The air is delivered into two aeration boxes (plenums) in each of the bins to distribute the airflow evenly across the base of the pile. • Air passes through 3/8-inch gaps between the boards. 	<p>Completed Aeration System</p> 
<ul style="list-style-type: none"> • This is a cross section of an empty bin • The green rectangles represent the walls • The brown areas represent the concrete floor • The yellow rectangles represent the boards • The white rectangles represent the plenum • The blue circles represent the aeration pipes. 	<p>Cross Section of an Aerated Bay</p> 
<ul style="list-style-type: none"> • Each bin is sized to accommodate 3 to 4 weeks volume of manure and spent bedding • The moisture content of the mix should be 60 to 65% going into the system. • It is not possible to evenly wet the batch down after the material has been placed in the bin • Flies and odors are generally not a problem because the older material is continually being covered by fresh material. 	<p>Filling the Bin</p> 

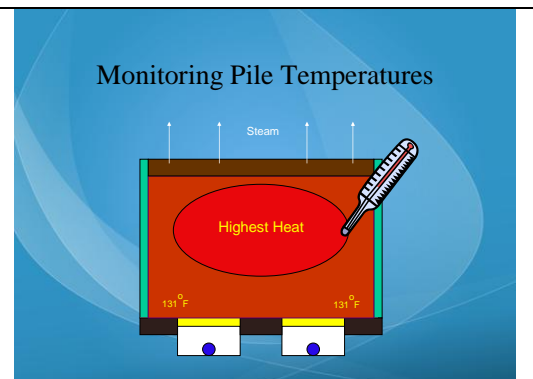
- Once the bin is within 6-inches of the top, it is essential to place a layer of finished compost on top of the fresh mix:
- It serves as a thermal blanket so that all of the mix can achieve temperatures to destroy pathogens, parasites and weed seeds.
- The cover helps control odors and flies
- It also helps retain moisture in the mix – if the moisture drops below 40%, composting stops.



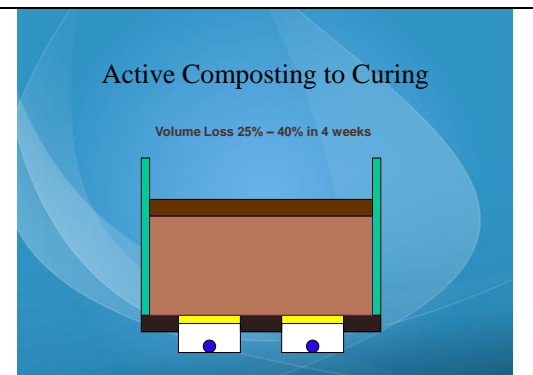
- With the bin filled and covered, we then turn on the airflow.
- A typical aeration sequence at start-up is 30-seconds ON and 30-minutes OFF (24/7).
- There may be a slight musty smell during the first few hours of composting, but this will even out quickly to a “friendly” organic odor.
- This is referred to as the Active Phase of Composting and will continue for ~30 days.



- The pile will likely be warm before turning on the airflow, but with aeration, the temperature will jump up 30° to 40°F in the first 12-hours.
- Our goal is to exceed 131°F throughout the pile for a minimum of 3-days
- The core of the pile, in the upper 2/3rds will be where we see the highest heat.
- Steam can typically be seen coming off the top of the pile, especially on cool mornings.



- We adjust the On/Off cycle to manage the pile temperature.
- If the pile temperature exceeds 160°F, we increase airflow to displace heat w/ cooler air.
- After achieving 131°F for 3-days, the fastest rate of composting is between 110° and 120°F
- It is typical to see ~25% shrinkage during the Active Phase.
- Pile temperatures will drop off after 3 weeks.



- The only thing that we may need to add to the manure mix is water
- With bedding, the manure waste can range widely in moisture content
- The best time to wet the mix down is in the stall, as shown to the right.
- This gives the manure time to absorb the water before being added to the bin.

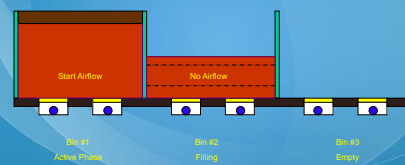
Moisture Conditioning the Mix



- The goal is for composting to be systematic and to require a minimum amount of time for monitoring and maintenance.
- When the first bin is full and being aerated, we simply move over and begin to fill Bin #2
- At first we take daily temperature readings from Bin #1 to learn the cause and effect of changing the airflow.
- After a batch or two, monitoring drops off.

Cross Section of a 3-Bay System

Stage 1



- When Bin #2 is full, we add a layer of finished compost as our cover and turn on the airflow.
- Air to Bin #1 can be decreased to ~20% by adjusting the gate valves.
- After 3 to 4 weeks, Bin #1 will transition into the Curing Phase of Composting, and you may see mushrooms on the top surface.
- While the blower and timer do all the work, we simply fill Bin #3, and repeat the process.

Cross Section of a 3-Bay System

Stage 2



- As Bin #3 is nearing full, you remove the compost from Bin #1 and either store it in a covered pile, apply it directly to the pastures or sell it to home gardeners or landscapers.
- Yes, it takes some time and effort to compost;
- But keeping up with this process eliminates the expense of manure disposal and converts this process to a simple daily / monthly routine that yields a true return on your investment.

Cross Section of a 3-Bay System

Stage 3

