Second of Two Parts

The 15 Benefits of Aerated Static Pile Composting

Aerated Static Pile (ASP) Composting will save you time and money, help you resolve offsite odor impacts and result in a higher quality compost product—all of which will improve your bottom line.

By Peter Moon

For compost facility owners and operators worldwide, there are three primary objectives in operating their systems:

1. Mitigate adverse impacts to the environment—specifically, we must avoid impacts to surface and ground water resources and air quality
2. Produce a safe, high-quality finished product
3. Minimize material handling as a means of reducing operating costs and maximizing profits

In Part 1 of this article, I discussed the basic principles of Aerated Static Pile Composting, including the anatomy of an ASP System, and the fact that compost piles do not need to be turned during the Active Phase of Composting (~30 days). In this article, I have listed 15 specific benefits of ASP Composting when compared to both turned windrow and Ph.D. (Piled Higher and Deeper) Composting.

15 Benefits of Using the ASP Method

#1: ASP Composting Eliminates the Need to Turn the Compost Pile

By inducing airflow into the compost pile, we are able to maintain aerobic conditions, manage pile temperatures and expedite the composting process to complete the Active Phase in approximately 30 days.

#2: ASP Composting Dramatically Reduces the Cost of Composting Operations

By not having to turn the piles with either a front-end loader or a specialized windrow turner, the operator dramatically reduces the cost of fuel, labor and equipment maintenance.

#3: ASP Composting Significantly Reduces the Amount of Water Consumption during the First 30 Days of Composting

When compost piles are turned, a considerable amount of moisture is lost to the atmosphere. ASP Composting has been shown to reduce

Upper Valley Disposal Service (Napa, CA). A good illustration of a very large Extended Aerated Static Pile System. Each pile (there are two shown) measures 550-feet long x 85-feet wide x 12-feet tall (~20,000 cubic yards each). The composting process for each pile is managed by 10 blowers operated by a programmable logic controller (PLC). This was a project that converted to an EASP system from a turned windrow system and reduced the overall footprint of the active composting area by 75 percent. In the early 1990s, this facility was on the verge of being closed down due to odor impacts to neighbors. With EASP Composting, the facility is still operating nearly 24 years later.

Two Particular Acres Compost (Royersford, PA)—it too illustrates an EASP System. This is a three zone system that reduced the footprint of the active area by 80 percent and tripled the throughput of the facility.

water consumption by 60 to 75 percent (Reference: City of Bakersfield, CA informal study).

#4: By Using a Compost Cover Layer, You Will Greatly Reduce the Generation of Offensive Odors and Mitigate Offsite Impacts to Neighbors and Passersby

The cover layer (~12-inches of finished, unscreened compost) serves as a biofilter to absorb odorous gases. The micro-organisms that reside in this outer layer digest these compounds in-situ and retain valuable nutrients in the finished compost product.

#5: ASP Composting Eliminates Pathogens, Parasites and Weed Seeds in Three Days

This same compost cover serves as an insulating blanket to ensure that all raw feedstocks achieve temperatures that equal or exceed 55°C (131°F) for a minimum of three days. These are the federal criteria for a Process to Further Reduce Pathogens (PFRP).

#6: ASP Composting also Reduces Emissions of Volatile Organic Compounds (VOCs), Greenhouse Gases and Ammonia

The biofilter cover has also been shown to retain a wide spectrum of VOCs, reducing off-gassing as much as 98 percent when compared side-by-side to a turned windrow process.

#7: The Compost Cover also Eliminates Access to the Raw Feedstocks by Flies, Rodents, Birds and Larger Wildlife

The compost cover also serves as a vector barrier. If vectors dig into the pile looking for food, they soon realize that it is way too hot to proceed any further. Fly larvae in the mix quickly cook as the pile temperatures rise during the first few hours of composting.

#8: ASP Composting is Well-Suited to all Varieties of Feedstocks, Including: Landscape Debris, Food Waste, Biosolids, Animal Mortalities and all Varieties of Animal Manure

ASP Composting was first developed in the early 1970s in Beltsville, MD, under a USDA Grant. It was initially used for composting sludge from wastewater treatment plants (now called biosolids).

#9: ASP Composting is Well-Suited to all Scales of Operation, from 2.5 Cubic Yard Systems to 100,000 Ton per Year Facilities

Starting with a Micro-Bin (2.5 cy) to test the effectiveness of the ASP Method, a facility can expand by using the freestanding ASP and the extended ASP approaches. As a result, ASP Composting easily accommodates volume fluctuations during the year and growth of the facility over time.

#10: Extended ASP Composting Greatly Reduces the Footprint of your Active Composting Area

By eliminating the alleyways and valleys between turned windrows, the footprint of the active compost area can be reduced by as much as 75 percent for a given volume of feedstocks. For this reason, and because the rate of composting is greatly increased, the flow through capacity for a given facility can be increased by 400 percent or more.

#11: ASP Composting is Easy and Quick to Integrate within an Existing Composting Operation

An ASP Pilot Project can be easily installed without the need to make any changes to an existing compost operation. When the ASP Method has been fully proven, conversion to this approach can be done all at once or in phases to minimize disruption of the existing operation.

#12: ASP Compost Systems can be Operated Using Solar Power or a Portable Generator

For sites that do not have access to grid electrical power, solar power (or generator power) is a viable and cost-reasonable option. This is particularly helpful for sites that are located in remote areas or on landfills where the site may change from time to time, thereby making the cost of power installation unreasonable.

A grant funded project in Tulare, CA (the Central Valley). This shows a three zone EASP System being constructed. The blowers were solar powered and the project demonstrated that with EASP Composting, the volatile organic compound (VOC) emissions are reduced by 95 percent when compared to turned windrow composting. This setup has since been used by the City of Bakersfield, CA and they have demonstrated a reduction in water usage of 70 percent with the EASP Method (a critical issue in California).
Photos courtesy of Peter Moon.

#13: Aerated Static Piles and Extended ASPs Can Be Constructed Using Conveyor Systems

As demonstrated in the Tulare, CA VOC Emission Reduction Study (2012), articulated conveyors can be used to construct very large compost piles, thereby reducing NOx emissions and greatly reducing handling time and diesel fuel consumption.

#14: ASP Can Evolve Over Time to Include an Intermediate or Comprehensive Compost Management System

The simplest form of ASP Composting includes portable blowers and individual timers to operate the blowers. An intermediate management system may include a programmable logic controller (PLC) with data logging capabilities to operate a set of blowers from one onsite location. A comprehensive management system may allow the operator to make adjustments remotely (i.e., offsite) using the Internet and a mobile device to observe and adjust blower settings. Increasing the operating technology can be done at a reasonable cost and without otherwise changing the site infrastructure.

#15: ASP Composting is Affordable: Every Dollar Invested in an ASP System will Result in a $10 (or More) Return on Investment in the First Year of Operation

The aeration equipment is inexpensive, when compared to non-recoverable costs associated with using heavy equipment to turn windrows. Using portable aeration equipment, an ASP System can be installed for $15,000 or less for a 10,000 ton per year compost facility. The return on investment is almost immediate.

The Best Kept Secret

For some reason, ASP Composting is one of the "best kept secrets" in the composting industry, despite the fact that this method has been available since the early 1970s and that many facilities worldwide have converted over to this technology. For those owners and operators who previously turned windrows for years, they all make the comment, "I wish I had learned about ASP Composting years ago." For those who have not yet tried ASP Composting, I strongly encourage them to give it a try on a pilot scale, and determine for themselves if the 15 benefits described in this article are, in fact, true.| WA

***Peter Moon**, P.E. is a licensed civil engineer in the State of Washington and his company, O2Compost (Snohomish, WA) specializes in compost facility design and operator training. All of Peter's designs include some form of ASP Composting. His company works with private and public sector clients located worldwide, and they help design systems for all varieties of organic "waste" and all scales of operation. If you are interested in composting more efficiently, O2Compost would be happy to schedule a time to meet with you for a free half-hour telephone conversation to discuss the specifics of your situation and to further explain the advantages of ASP Composting. To learn more about ASP Composting, attend Peter's ASP workshop at the 2016 U.S. Composting Council Conference in Jacksonville, FL (Monday, January 25, 2016). For more information on O2Compost, visit www.o2compost.com.*