



COMPOSTING PERSPECTIVES

TECHNOLOGY · TECHNIQUES · HELPFUL TIPS · SPRING 2009

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More Crop Per Drop

How humus compost can help conserve water



Recent news has focused on global food scarcity as well as high input prices, but some are starting to see that the next scarce resource is going to be... good old water. It seems like we have plenty, but the demands increase each year due to increasing population and higher living standards, and aquifers and wetlands around the world are becoming depleted at alarming rates. Some of our customers in arid

climates already experience shortages of irrigation water, and of course many metropolitan areas have instituted water rationing in dry periods over the past several years. Some regions of Australia have experienced several years running of drought conditions, with many farms struggling or shut down. Publications from small-town farm papers to *The Economist* have discussed the water shortage from local and global perspectives.

The good news is that humus technology and the Advanced Composting System can ease the water crisis in several ways.

First and most important, humus (the final product of the ACS process) holds four times its weight in water, and this property is gradually worked into the soil structure after application. This means a significant reduction of runoff and evaporation of rainwater, reducing the need for irrigation. And since the irrigation water is also more likely to benefit the soil, we have seen reductions of 25 to 50 percent of irrigation requirements (depending on climate, initial soil conditions, crop, and other factors). This applies to landscape and athletic fields as well as agricultural uses. And with less irrigation and less runoff, there is less erosion, yet another soil benefit of humus.

Not only does the humus hold and conserve more water in the soil, the amount of water needed to grow the same amount of dry matter is greatly reduced. Using humus promotes a balanced ratio of carbon to nitrogen in the cell of the plant, causing the plant to utilize less hydrogen and oxygen. This results in less water use, a shorter crop dry-down, and longer shelf life.

And of course the fertility benefits of humus allow plants to grow more quickly with greater strength, health, and size. Humus is made up of polymers containing high quality balanced amino acids. These amino acids are complete plant food that are very attractive for growing highly

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The Importance of Tines

An Editorial by Ernest Blosser, Vice President, Midwest Bio-Systems

In a windrow compost turner, the design and function of the tines is of utmost importance. Their design, placement, and function can assist or impede the formation of humus. The drum, with its attached tines, is the “business” part of the turner. It is designed to handle or address every particle. Everything else is peripheral compared to the tines.

Since about 70 percent of the excrement of aerobic micro-organisms is carbon dioxide (CO₂), this places a great burden on the tines to accomplish gaseous exchange. Because maintaining the correct levels of CO₂ is so crucial, we measure gaseous exchange often using a CO₂ kit. If making humus is your goal, you should have 4 percent or less CO₂ remaining immediately after turning. So how does tine maintenance and design affect gaseous exchange? Hard facing the tip of the tine versus hard facing the face of the tine allows for much greater gaseous exchange.



We are now in about the ninth drum/tine design in our constant effort for excellence. Improved peaking of the windrow is one function of the new drum/tine design on our Aeromaster compost turner.

If the front edges of your tines are so worn that the radius reaches to the back of the tines, replacement or repair is overdue. The best strategy is to slightly hard face the tines before the original hard facing has completely worn off. This gives the maximum life to the tine and accommodates less frequent replacement. We have experimented with hard facing the face versus hard facing only the tip of the tine and found very little difference in how long a tine wears. If the tines are worn more than 3/8 inch, the power requirement for turning goes up dramatically which increases wear on the drive train. Tines can be turned around, keeping the same working configuration, by installing them on the opposite end of the drum using new hardware.

Tines are available in abrasion-resistant steel, a good choice to reduce wear but also beneficial because they are stiffer and do not bend easily. Adding a hard wearing material to the tip of the tine also prolongs the life of the tine. The minimal cost of hard-facing adds life to the tine and reduces cost of operation. Bolt-on tines are easy to replace, but the less frequently tines must be replaced the more time, labor, and money you save. New hardware should always be used when installing new tines or re-installing used ones because the locking function of the bolt/locknut is not as effective if the hardware is reused. As a result, using used hardware can result in losing tines. After the tines are installed, the turner should be operated and checked for dynamic balance. Aeromaster compost turners are built with balancing options.

Quite a few operators of other brands of compost turners have chosen to install Aeromaster tines, benefitting from their superior design. Remember, humus is the work of the micro-life. However, the design of the turner impacts their working environment, whether positively or negatively!



WORKSHOPS

"I have attended five other composting workshops and seminars. The Midwest Bio-Systems seminar has given me the most answers to my technical questions."

"The folks at MBS use a systematic approach to composting that I found both essential to making high quality compost and making it on a consistent basis."

"I was very impressed. My trip paid for itself in the first half-day."

"This is a system that works! I came away knowing how to do it!"

2009 Workshops

May 27-29 — Bogota, Colombia

(TBD) — Tampico, IL area

*Let us know you're interested in coming to a workshop by **contacting us** using one of the methods listed below...*

ACS Compost Workshops provide training in the best methods for converting agricultural waste and organic matter into highly effective organic fertilizer.

ACS Compost Workshops are located near compost production facilities that practice the Advanced Composting System principles. During visits to the compost site, we will demonstrate what was taught in the classroom in a **real work environment**. Our updated curriculum expands the **hands-on** time at the compost site to increase the confidence level of participants so that they can go home and produce highly effective organic compost. **Compost site demonstrations** include windrow building, compost turning, watering and microbial inoculation techniques, and the use of compost process monitoring instruments. The sessions also include production **troubleshooting** as well as the tips on increasing compost quality **without increasing the cost**.

It is the combination of classroom instruction and compost site work that make the ACS Compost Workshops an effective way for you to get started or improve your existing operations.

Contact us today for other information or to request a workshop!

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Email: MBS@MidwestBioSystems.com

Web: www.MidwestBioSystems.com/services-workshops.html (fill out form)

Oasis In Coffee County

Succeeding in Business While Helping the Environment

By CAROLE BRAND — Reprinted by permission from *eprisenow.com*, Coffee County, AL

Going “green” is the emphasis of a new organic compost company starting in Coffee County.

Owner Bob McMillan of Oasis, an agricultural organic company and company Manager Steve Adkison of New Brockton, now have a unique way of channeling compost organically to turn it into humus, a product that holds four times more water than regular compost or soil.



Adkison said McMillan always had a “passion for the environment and this is part of his dream.”

“Bob and our company believes the more waste we can take out of the landfills, the better everyone, especially our future and our children’s future, will be because of this,” Adkison said.

To explain the procedure or “recipe” for making the unique compost product, Ted Hostetler, an Arkansas consultant who is a member of a Mennonite [owned] company called Midwest Bio-Systems in Illinois, traveled to Coffee County this week to instruct Oasis company members on the process. Midwest Bio-Systems makes the equipment used for the environmentally sound product and has systems in more than 18 countries worldwide.

“This is not your regular compost people think of made simply of manure,” Hostetler explained. “And that’s what most people think when you think of compost. Actually, it’s a special compost system using a process that is only 25 percent manure. The rest can be made up of wood chips, hay, peanut hulls and even clay. Regular compost has a terrible odor, but this doesn’t.”

Hostetler explained the procedure of making the humus takes from eight to 12 weeks.

With special equipment used only for this process, the composting system was discovered [in Austria] by the Mennonites 15 years ago. The company starting near New Brockton will be the first of its kind in Southeast Alabama.

“We help people be successful in this business that helps the environment,” Hostetler said. “The process begins by making rows of the combined manure, hay, peanut hulls or wood chips, or whatever you have. It is turned each day by the special equipment and monitored with daily temperature checks. We look at the CO₂ levels and the temperature levels because the goal is to make the humus. After many weeks of checking the levels of carbon dioxide and temperatures, the humus product is sent to a lab and graded.

Hostetler said humus is an organic material that becomes “odorless, weedless, and kills bacteria. Humus makes the roots of plants extract moisture from the soil and puts biological life back into the soil when used. Since it holds more water than regular compost, it is an excellent high-intensity organic plant food. People are surprised when they use it with plants because the plants grow more beautiful and keep their color and insects are deterred from the plants and gardens that use it.”

The organic procedure, Oasis members say, can be used for lawn maintenance, homeowners who want their gardens or plants to be maintained better and longer, gardeners for better vegetables and farmers for growing better crops.

"This is a product that we hope will also be used by many municipalities, contractors and lawn sodding companies," Adkison said. "Also, to save the landfills that are being used constantly, municipalities can bring us their limbs they pick up from residents and wood companies can bring their excess and we'll use all of this in the compost. This will save the landfills for the environment, it will also save the municipalities monies used to pay the landfills. It's just a win-win situation."



With land located to start a plant in New Brockton, Adkison said the business is starting small, but eventually will employ workers as the business grows.

"The product will be ready by January 1, 2009, for sale by the yard or tons. As the agriculture business grows, we'll be able to sell the product in bags for individuals, but in January, we'll load them up with a couple of yards if they want it."

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Featured Dealer: *Ibicol Ltda*



Ibicol Ltda is a Colombian company dedicated to offering products and solutions to the organic grower and the conventional grower that is looking for cleaner production. In addition to Midwest Bio Systems' Advanced Composting System, Ibicol offers plant protection programs, fertilizers, and microbial products.

Ibicol is part of Praco Didacol S.A, a company that has served the Colombian market for over 100 years selling construction and agricultural equipment as well as motor vehicles. For more information, contact Francisco Pradilla at +57 310 222 6256 • email: fpradilla@didacol.com • Web site: www.ibicol.com.co.

More Crop Per Drop (continued from Page 1)

productive and nutritious crops. If the plant takes in balanced amino acids such as those available in humus, the plant grows cells that contain less water. This means that humus technology gives "more crop per drop" in two ways — more crop, and fewer drops! So one way Midwest is helping with the looming water crisis is by providing a way for farmers to increase yields while making more efficient use of their irrigation.

Midwest's own Advanced Composting System also conserves water during the composting process. Since the



water is applied during windrow turning, application is even throughout the windrow to prevent leaching, runoff, and evaporation. We call this "watering each particle" as opposed to watering only the top of the windrow. And because the Aeromaster turners treat particles gently and allow them to maintain their independence, the water in the windrow is preserved for longer useful life.

The system also preserves water by using specially designed non-woven textile covers that allow respiration (the critical exchange of oxygen and carbon dioxide that keeps the windrow active) while reducing evaporation and water loss. These covers also shed excess rainwater from the pile preventing ruination of in-process and finished humus.

Clay is an important component of any recipe for making humus, and it also has beneficial effects on the water-holding capacity of the windrow itself. In order to do this, it must be loose and friable, not in clods (where most of the clay particles are unavailable to attach to water and other recipe ingredients).

Reaping the Benefits of Compost Tea Post-Harvest

Our July newsletter article on post-harvest application of tea generated a lot of interest. An expanded version was published in the November issue of Acres U.S.A Magazine. An excerpt of this expanded version is below.

After harvesting most crops, some of the plant remains above-ground.

A great opportunity comes from capturing the material that initially wants to evaporate out of the plant because it is the simple compounds that easily volatilize (i.e., escape) into the air.

First, let's discuss what kind of extract will make the most beneficial treatment. Humus, which can be produced by a managed process on the farm, is a very powerful substance that attracts soil particles in such a way as to open pore space and enhance tilth. In addition to this physical change, humus also

contributes to the mineral balance and diverse biological activity. This biological activity has three primary functions: recycling nutrients, providing nutrients in plant-friendly forms, and impacting the soil structure via lifecycle by-products.

Because there is such a variety of soil conditions, organic materials, and mineral contents, we want the widest possible variety of microbial life.

In addition, we want that life to have the potential to expand rapidly — doubling a minimum of 30 times. Humus provides the nutrients, space, moisture, and other factors that allow the needed species to reproduce and become available to perform their functions.

In dealing with crop residue, several things should be considered. One is that the residue has an abundance of organic matter that has been built up by the plant into complex structures. Another factor is that the natural respiration of the plant involves movement of additional, less complex, and more volatile compounds up and down (mostly up!) the roots, stalks, and stems of the plant. Both the "standing" organic matter and the "flowing" compounds contain vital nutrients that can be available for future crops if they are treated properly.

Applying tea immediately following harvest can help to "lock in" the nutrients, which are then restored to the soil the plants exist in. The net effect is to improve the health of the soil at a low cost and provide "free" nutrients to the next crop. This is especially necessary and beneficial on a farm emphasizing organic fertility.

To enhance this effect even further, incorporate residues into the soil or use a roller to put the stalks in contact with the soil, which is especially

helpful in no-till operations, so that the activity can become integrated with the soil's natural biological cycles. It is important that the tea application must be within hours of harvest, as that is the time when the respiration is continuing most strongly.

Obviously the quality of the tea is important to this process. A high-volume tea extractor is available from Midwest Bio-Systems. An activator, also available from Midwest Bio-Systems, will enhance the output. Some agronomists also call for fish molasses as an additive prior to application.



WITHOUT APPLICATION: *Nutrients escape through stems and leaves into the air.*



WITH APPLICATION: *Microbes coat and close plant's pores. Microbes capture nutrients and restore them back to the soil.*





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Aeromaster Turners

Why Are They Better?

If you are interested in making the highest-quality, highest-value compost for resale at premium prices, **Aeromaster compost turners** are an essential part of the Advanced Composting System from MBS.

However, maybe you're not interested in going that far — maybe your interests don't go beyond manageable waste disposal for your city or county, or manure recycling for your farm. Whatever your volume or resale needs, Aeromaster offers the best compost turners for the job.

Aeromaster turners offer the best drum and tine design (see page 2) for efficient gas exchange and superior windrow architecture. The variable speed, adjustable height drum thoroughly mixes windrow materials with water and inoculants, managing the temperature, without pulverizing the humus crumb structure that is essential to good compost.

And, Aeromasters are tough and well-engineered to give you years of dependable service.

Check them out today at www.midwestbiosystems.com.



Composting Perspectives

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