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SUN GRO HORTICULTURE

THE SUN GRO'er

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Welcome!

Welcome to another edition of the Sun Gro'er newsletter. There have been many changes here at Sun Gro since the last newsletter. Sun Gro has acquired Pigeon Hill Peat, Lameque Quality Group and, most importantly, the Metro-Mix ® line of growing media. In the future editions of the newsletter, we will be providing more information on the Metro Mix ® products and the plants that produce them.

In this newsletter, we will have articles by Ron Walden on the composting of peanut hulls for use in growing media and Mark Thomas on the storage and handling of our product. We also have a contact list for all of the Sun Gro Technical Specialists and Customer Resource locations. We hope you find these articles educational and helpful for your growing practices or those of your customers.

-Daniel Jacques

The Storage and Handling of Sun Gro Products

It has always been our policy as the makers of Sunshine Mix, Metro, Mix Peat Moss, Technigro Fertilizer, and Stronglite minerals to produce and ship these products in an environment that is free of toxic contaminants. We do not keep herbicides or other harmful chemicals in or near our manufacturing facilities. We make every effort to select trucks that have not carried any potential toxins and require them to be clean prior to loading.

We would like to extend our safety measures to our distributors' and customers' facilities. To that end, we offer these storage and handling guidelines. We ask your cooperation to maintain the quality of the product you receive.

INSIDE STORAGE

Mix, Peat Moss and Minerals

It is generally preferable to store Sunshine Mix, Metro Mix and Peat Moss inside a building with a clean, solid floor. Exposure to excessive heat and sunlight causes decay of plastic and paper bags and accelerates degradation of nutrients and wetting agents in the mixes.

Storage and Handling (from page 1)

No Sun Gro product should be stored under or near chemicals such as herbicides, insecticides, disinfectants or even fertilizers. Whether liquid or dry, such chemicals can penetrate plastic or paper bags, and ruin the contents. These products are best stored in different parts of the building.

Technigro Fertilizer

Technigro Fertilizer should never be stored outside, in a greenhouse or other hot, damp locations. Even though it is in heavy plastic bags, these conditions can lead to hardening especially if there are small holes in the bag. Pallets should not be stacked.

Refer to the Department of Transportation or your insurance company regulations regarding oxidizers.

OUTSIDE STORAGE

If it is necessary to keep mix, peat, or minerals outside, they should be stacked on pallets or a raised platform to prevent bales from lying in water. A layer of smooth gravel covered with heavy, porous plastic might be satisfactory. The stacked bales or bags should be covered with a heavy tarp. The goal is to keep out sunlight and precipitation, but the cover might also cause heat buildup. Prolonged heat can result in drying or hardening of peat-lite mixes and peat moss.

Bales with stapled closures should be stored with arrows pointing down. Loose filled 3 cu. ft. bags have breather holes, which can allow water in, but can also allow the product to dry out under adverse conditions. When peat-lite mixes get wet in the bag, nutrients are lost, the lime is activated and pH tends to rise quickly. This can lead to performance problems when the product is used.

Products stored outside should not be placed where they are subject to drift, splash or spray from chemicals used on farm fields, railroads, power lines, ditches, manufacturing facilities, etc. Bales kept outside are more likely to pick up drifting weed seeds that get caught in folds or stick to the plastic. We can usually identify whether weeds are native to Canada or to the area where product was stored.

DAMAGED BAGS

Damaged bags should be taped securely or disposed of immediately. If the product is torn when you receive it, note the damage on your shipping papers and call our Customer Service. If the damage is our fault, the product will be credited or replaced.

SHIPPING AND HANDLING

When putting peat-lite mixes, peat moss, fertilizer, or mineral bags on a truck with chemicals, care must be taken to keep them apart. We recommend stacking peat and potting soil neatly, securing with load locks and separating from other products with plywood or cardboard. Chemicals that might break or spill should be packed in a manner to prevent such accidents. If chemicals including fertilizer should spill on bags of peat or media, those bags should be destroyed or disposed of immediately. They must not be sold or used. The vehicle or area of the spill should be thoroughly

Take care when loading product on a truck with chemicals

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Storage and Handling (from page 2)

cleaned before peat, media or fertilizer is again placed there.

SHELF LIFE

Normal stock rotation practices i.e., first in/first out should be observed with Mix, Peat Moss and Technigro. Mixes leave our plant soon after manufacture. We recommend that they not be stored more than six (6) months. If the product is more than one (1) year old (according to the production code stamped on the bag), you should arrange with your Sun Gro Sales Manager to send samples to Sun Gro Analytical Laboratories for testing. We will tell you what precautions, if any, must be taken to achieve optimum results.

Technigro Fertilizers also should not be kept more than a year although under ideal conditions, the product will remain good indefinitely. Technigro also has a production code of each bag to identify date of manufacture.

Peat Moss should not be stored more than one (1) year. Older bales should be examined or tested for usability before sale or use.

PRODUCTION CODES

Mix and Peat Moss are stamped with production codes. For example,

E0120 means:

E	Produced at the Elma facility
0	2000
120	120th day of the year

In addition to producing a quality product, we perform extensive tests to assure the quality. Records and samples are kept from each lot produced. Every bag or bale filled should have a code number stamped on it. It is our policy to record these numbers on bills of lading and/or invoices in order to track the product. This information can be very useful if a question arises as to the quality or freshness of a product.

We strongly urge distributors and users of our products to record these numbers on their own invoices or production records. This is for your protection as well as ours.

We hope these guidelines will be useful to you in preventing damage to our product and to your profits. If you suspect damaged product or have questions about performance or use of our products, please call your Sun Gro Customer Service Representative.

~Submitted by Mark Thomas

TECH TIPS

- The following will help you calculate the amount of a fertilizer to add, in ounces for stock and final solutions. It works well for small amounts of stock solution.

  Divide the desired ppm of the nutrient by the percentage of that nutrient in the fertilizer, expressed as a decimal. Divide that number by 75. This gives you the ounces of fertilizer per 100 gallons of final solution. If you have a 1:100 injector, that number is also the oz. Per gallon of stock solution. For a 1:128 injector, multiply that value by 1.28 to get the oz. Per gallon of stock. For a 1:200 injector, multiply that value by 2 to get the oz. Per gallon of stock.

  Example: You want to drench your crop with 25 ppm of iron. You have a chelated iron product that is 10% iron. Your injector is set at 1:100. You would do the following:

  1.25/0.1 = 250

  2.250/75 = 3.33

  This means that you would need to use 3.33 ounces of the chelated iron product for each gallon of stock solution. Note: When making your fertilizer concentrate, always put the fertilizer in the bucket first and then add water to bring it up to the desired number of gallons.

- What do you do when your pansies or other bedding plants are outside and it has been raining for 5 or 6 days and they are looking hungry? Do you wait until the rain stops and then fertilize them? That would mean an extra day of the plants being soaked. The better thing to do is to fertilize while it's raining. After all, once the mix is saturated, it's not going to get any wetter. Try to do it just before the rain ends, so that there is no extension in the amount of time that the mix is saturated. You should try to feed at about 50% more than normal, especially if it has been raining hard for quite a bit of time. Remember that rainwater tends to be pretty much near 0 in alkalinity, so you may want to use a less acidifying fertilizer.

Notes from Walden's Pond

Some Like it Hot...and Some Don't

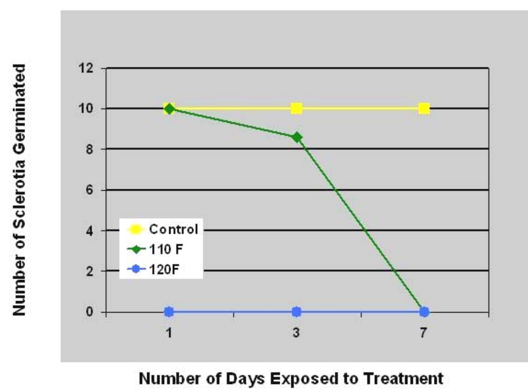
Here's a question that comes up often when discussing growing media that contain composted materials such as pine bark or peanut hulls. If these composts are so biologically active, what assurance does a grower have that some of that biological activity isn't plant pathogenic? Growers may remember that in times past mixes containing mineral soil were routinely steam-sterilize to eliminate disease organisms and the 'rule of thumb' was that a moist 160F for 30 minutes would do the job. So it would appear that we could answer this question if we knew whether compost piles routinely develop such conditions. Truth is, as you may already suspect, it's actually a little more complicated than that.

Generally speaking, the competition among all types of microorganisms in compost is so intense that the mycelia (vegetative bodies) of disease organisms have little chance of survival. Their best strategy is to outlast the competition as resistant spores or sclerotia that can spring to life when conditions are favorable. These are the biotic agents that need to be eliminated during composting. A second factor we need to consider is that the thermal death points of these organisms depend on both the temperature and the duration of exposure to that temperature. Another biological example of this principle is the fact that the same plant roots killed by a 30-minute exposure to 126F are also killed by a 5-hour exposure to 115F. Sufficiently hot for sufficiently long will do the job. The same principle applies to killing the spores or sclerotia of pathogens. To fully answer our grower question we need to know 1) the temperature-exposure combinations that constitute the thermal death points of the relevant pathogen and 2) temperature patterns in the compost windrow.

One of the fungal pathogens reputed to have very resistant sclerotia is *Sclerotium rolfsii*, responsible for the disease known as Southern Blight. Southern Blight has several ornamental hosts, including hosta and daylily, as well as agronomic hosts that include peanuts. Since composted peanut hulls are used as a media component, our original question becomes quite relevant. This disease is widespread in areas with temperate winters such as the southern U.S. but requires high humidity and night temperatures for its development; therefore, it is a minor disease of peanuts in Virginia but is the major peanut disease further south in Georgia. For the same climatic reasons, Southern Blight is mostly a concern in nurseries in the Deep South.

To eliminate any concerns about Southern Blight on peanut hulls surviving the compost process, we asked researchers at Virginia Tech to determine the temperature and exposure times necessary to kill its sclerotia. In a laboratory study, they tested sclerotium viability after constant exposure to room temperature (70-75F) or exposure to 110F or 120F for 1, 3, or 7 days. The sclerotia were wrapped in filter paper envelopes placed within beakers filled with moist container medium on a lab bench or inside temperature-controlled growth chambers. At the completion of each temperature-exposure treatment, the sclerotia were removed from their envelopes and placed on agar plates to be observed for germination at room temperature. The results of this study showed 110F to be the critical temperature with regard to Southern

Figure 1. The effect of heat treatment on germination of Southern Blight sclerotia.



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Some Like it Hot….. (from page 4)

Blight sclerotia survival (Fig. 1). All sclerotia were still viable following constant exposure to room temperature or 1 day at 110F. Following 3 days exposure, 86% still germinated, but no sclerotia survived a 7-day exposure to 110F. And no sclerotia germinated after a single day exposure to 120F.

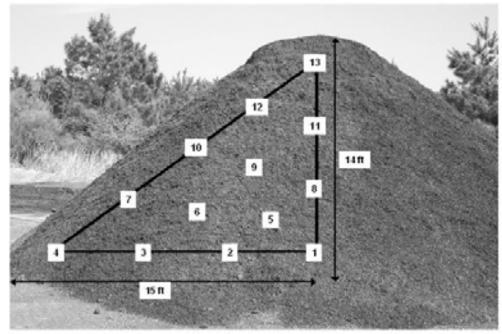
Now all we need to know is whether or not composting peanut hulls attain such temperatures.

To determine the temperature profile of a composting peanut hull windrow, we placed 13 temperature sensor/loggers in a cross-sectional array at the mid-point of a windrow (Fig. 2) as it was being constructed on March 25. The windrow was approximately 14 ft H x 30 ft W x 50 ft L. Sensors were located along the vertical center and horizontal bottom half of the windrow, with additional sensors radiating outward within that half of the windrow to within 2 ft. of the surface (Fig.3). Temperatures were recorded every 30 min for 14 days. Sensors were removed when the windrow was turned on April 8 and reinstalled on April 27 when the windrow was turned for the second time. Temperatures were then recorded until May 13.

Figure 2. Temperature sensor/logger location within the peanut hull compost windrow.

Peanut hull compost temperatures were never less than 110F (our critical temperature) at any location during a 7-day period only one week after constructing the windrow (Table 1), with the exception of the bottom location closest to the surface (#4 in Fig. 3). One month later, after a second turning, temperatures at all locations within the windrow exceeded 130F for a 7-day period. These results indicate that the degree and duration of composting temperatures are more than sufficient to eliminate the Southern Blight sclerotia from composted peanut hulls. Subsequent turnings of the windrow during the typical 8-week composting process would ensure that all of the composting materials are exposed to these killing temperatures.

Figure 3. Individual temperature sensor/logger locations within the peanut hull compost windrow.



So now we can answer our original question, "Does the grower have some assurance that composted media components are generally disease free?" In the case of composted peanuts hulls, on the basis of temperature, I'd say "Yes, and then some."

This article was based on research reported in ***Peanut Hull Composting Temperatures and Implications for Sclerotia Viability of* Sclerotium rolfsii, *T.J. Banko, A.L. Landon, and R.F. Walden, SNA Research Conference Proceedings, 49:235-239.***

~Ron Walden

Table 1. Peanut hull compost temperatures (F) over 7 days at various locations within a windrow (see Fig. 3) following initial construction and the second turning one month later.

	Week beginning April 1			*Week beginning May 1*		
Location	**Low**	**High**	**Mean**	**Low**	**High**	**Mean**
1	113.7	128.3	120.6	141.8	158.0	150.6
2	142.7	158.0	153.0	140.9	154.4	149.5
3	129.2	150.8	140.1	132.8	155.3	146.6
4	98.6	144.5	117.6	130.1	155.3	144.7
5	145.4	157.1	153.7	155.3	158.0	157.0
6	147.2	163.4	153.4	155.3	158.9	157.0
7	111.1	150.8	127.3	143.6	158.9	153.2
8	149.9	160.7	156.0	149.9	164.3	157.0
9	156.2	168.8	160.7	158.0	162.5	161.4
10	127.4	156.2	139.6	149.0	162.5	156.0
11	154.7	162.4	157.6	153.5	162.5	158.5
12	129.2	162.5	141.2	157.1	169.7	163.5
13	160.7	167.9	162.9	143.6	156.2	152.5

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