Appendix J

Amerigrow Mulch Proposal and Documentation

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National Conference on Weights and Measures / National Type Evaluation Program

Form 15: Proposal to Amend Handbooks

Date: September 11, 2009	**Regional Association (s) you wish to consider this proposal:** ☐Central ☐Northeast ☒Southern ☐Western
Submitter Name: C. Tomlinson/Amerigrow Recycling **Address:** 10320 W. Atlantic Ave, Delray Beach, FL 33446 **Phone:** 561-499-8148 **Fax:** 561-499-5896 **Email:** chuck@amerigrow.com	**Regional Actions:** (for use by regional standing committee-votes for and against)

Please attach any background Information, test data, research or additional Documentation that will help the Committee consider the proposal.

Purpose: (Provide a concise statement as to the intent or purpose of this proposal.)
To request that the NIST update their Handbook 133 regarding the methods of measurement of the volume of bagged mulch to take into consideration, the major changes in the mulch industry which have occurred since the last update in 1999.

Proposal: (Provide solutions to problems in specific language in amendment form to handbooks; if a proposal involves a new area of weights and measures activity, provide recommendations for both, regulations and test methods for proper enforcement.) Identify the specific handbook, section and paragraph that would be changed (e.g., Amend Handbook 44, Sec 1.10. General Code, paragraph G-A.1. Commercial and Law-Enforcement Equipment as follows:).
See attached # 1 - Proposals

Justification: (Provide justification for national consideration of this proposal.)
See attached # 2 - Justification

Other Contacts: (Provide position statements, comments, etc. with names and addresses of individuals, firms, manufacturers, and/or trade associations included in developing the proposal.)
None

Other Reasons For: (If none, please indicate none have emerged.)
None

Other Reasons Against:
None

Provide evidence of consistency with other NCWM publications, such as other specific device code section and applicable federal laws and regulations (e.g., USDA):
Unknown

Additional Considerations: (Provide cost estimates and the anticipated benefits for all stakeholders or indicate how the proposal may affect other requirements, programs, etc.)
Unknown

List of Attachments: (documents, data, studies, etc.) -Penn State Cooperative Extension, Home Gardeners Headline Newsletter, Summer 2004. Page 3 of 17. -University of Florida Publication ENH103, Mulches for the Landscape. Page 5 of 5 -Amerigrow Recycling February 13, 2008 - March 28, 2008 test of red and Gold colored mulch.	**Suggested Action:** (Be specific as to the action you request of the committee on this proposal.) Recommend NCWM ☒ Adoption ☐ Withdraw ☐ Developing Item ☐ Informational Item ☐ Other (Please describe)
Send submissions for Regional Associations to: National Conference on Weights & Measures 1135 M Street Suite 110 Lincoln, NE 68508 Attention: Executive Director, info@ncwm.net	**Regional Standing Committees and Sectors submit form to:** National Institute of Standards & Technology Weights & Measures Division 100 Bureau Drive, Stop 2600 Gaithersburg, Maryland 20899-2600 Attention: Committee cc: Attention: Executive Secretary, owm@nist.gov

Revised: September, 2009

ATTACHMENT # 1 - PROPOSALS

Problem #1: Over time bagged mulch suffers from decomposition and desiccation. Unlike most other products, it turns into "dirt" as it ages.

In an article published by the Penn State Cooperative Extension, in Home Gardeners Newsletter, Summer 2004, it is stated that "like other organic matter, wood and bark decompose over time. The primary organisms involved with their decomposition are bacteria and fungi, which derive their energy for growth from carbon-based compounds found in wood and bark. Some fungi, such as artillery fungus are "recyclers" and break down woody tissue directly".

In an article published by the University of Florida Extension Service, Mulches for the Landscape, Publication #ENH103, it is stated "do not store organic mulches, because they will rapidly decompose in the bag".

In addition, wood, which is ground into mulch, contains moisture (one of the desired qualities of mulch is its ability to hold water) and colored mulch contains even more, since approximately 8.26 gallons of water per yard or .60 gallons per bag is added to the mulch during the coloring process. Also, if processing is done in the rain, the moisture content will be even higher. Obviously, over a period of time, especially in the hot Florida sun, there is a major moisture loss and volume from evaporation.

On February 13, 2008 Amerigrow bagged 2 pallets of red mulch and 2 pallets of gold mulch. These 4 pallets were produced in bagging runs during which we more frequently sampled bags off the line to ensure an accurate 2 cu. ft. fill rate. These pallets of mulch were allowed to sit outside until March 28, 2008, at which time 4 bags from the top of each of these 4 pallets were re-measured. The gold bags measured 13.75% less volume and the red bags measured 12.50% less volume. This loss in volume can be attributed to a combination of the decomposition of the mulch and a loss in the volume of water content of the mulch.

There is also the temporary affect of compaction when mulch is stored under weight (which typically may be other bags of mulch). An unscreened bag of colored mulch (which these bags were) typically weighs approximately 37 lbs and a pallet consists of 75 bags weighing a total of approximately 2800 lbs. The bags on the bottom of the pallet with approximately 1 ton of weight above will be compressed, resulting in a temporary loss in volume. Additionally, if the bags tested had been pulled from the bottom of the pallets, the decrease in the volume of the mulch would have been even greater from the compaction.

Solutions to Problem #1: NIST Handbook 133, 4th Edition needs to add in Chapter 3.11 Mulch and Soils Labeled by Volume, a paragraph to cover the decomposition of wood mulch over a period of time. The purchase date of the product needs to be proven so that a reasonable estimate can be made as to whether an upward adjustment needs to be made to properly reflect decomposition since the purchase date.

Under 1.1 Scope, retail "shortages may also be caused by moisture loss (desiccation) if the product is packaged in permeable media", such as is the case with ventilated mulch bags, however, this apparently is not applied to the testing of mulch volumes. Moisture allowances over time need to be determined as they have been for flour and then used in the adjustment of MAV as in section 2.3, How is The Maximum Allowable Variation MAV corrected for the Moisture Allowance?

NIST Handbook #133 4th Edition needs to add in Chapter 2 section 2.3 Moisture Allowances a category including mulch and soil in addition to the current category for flour and dry pet food. It should be required that the purchase date of the product is proven so that a reasonable estimate can be made as to whether an upward adjustment needs to be made to properly reflect desiccation since the purchase date. The Handbook now covers on page 3, "deviations from the net quantity of contents caused by the loss or gain of moisture from the package are permitted when they are caused by ordinary or customary exposure, that normally occur in good distribution practices and that unavoidably result in change of weight or measure", however, this apparently is not applied to the testing of mulch volumes.

In addition, under 3.11 Mulch and Soils Labeled by Volume, evaluation of results, the 5% MAV allowed on one bag in twelve, may compensate for deviations in filling, but doesn't compensate for all twelve bags in a test of mulch being short because of decomposition and desiccation. Theoretically the shortage of all the bags produced and sold at the same point in time should be consistently short and an adjustment needed for decomposition and desiccation.

Problem # 2: It is easy to tamper with mulch bags (open and reseal the bags), which depending upon possible hidden agendas, as there was in our case, can create a major problem. Not only can the fill rate be altered, but also contaminants can be put into the bag. We had a situation several years ago, in which a competitor of ours visited a customer with several of our mulch bags, proceeded to open one in front of our customer, poured it on the ground and a soda can came out. Obviously, it is hard to conceive that he was lucky enough to pick a bag that had a soda can in it, and because of the size of the soda can, it would have been next to impossible for it to pass through our equipment.

Solution to Problem # 2: Testing of mulch bag volumes should require the establishment of a chain of custody, beginning with the purchase date, in order to determine the age of the mulch and the conditions of storage (which is also necessary for the solution to Problem 1). It is too easy to tamper with mulch bags to not determine the chain of custody from the manufacturer to the point of sale. This may not be a problem when the mulch is delivered to the point of sale (e.g. big box store) by the manufacturer, but when there is another party involved, who doesn't account for the purchase details (such as someone with a hidden agenda), this is a problem.

Problem # 3: Bags of mulch with different sizes of grind can produce different fill rates when measured in the measuring box specified in table 3-4 in the NIST Handbook 133. For a 2 cubic foot bag, the specifications call for a box with interior wall dimensions of 16" in length, 9" in width and 48" in height.

We ran a volume test of a competitor's mulch following the required procedures and found that, even though their bags weight 9-10 pounds less than ours, theirs still almost filled the 2 cubic foot measuring box. Upon examination, the reason became obvious – their grind was much larger with some very long pieces, which created substantial air pockets when the standard procedures were used (fluffing the mulch into the measuring container). The bags technically, but not really, meet the legal requirements. This results in the Division of Weights and Measures being satisfied with the fill rate and the public buying pockets of air.

The mulch produced by Amerigrow is a much finer grind and does not benefit from rolling the bags and fluffing the mulch. Under the current regulations, there is no maximum acceptable size of the wood mulch pieces, and to take it to the extreme, what if the bag of mulch contained 10% pieces over 9" (the width of the required measuring box), and 50% +/- of these pieces end up angled form front to back, creating many large air pockets; would that be fair to the public?

Solution to Problem # 3: Make the specifications for the measuring box for a 2 cubic foot bag of mulch, 12" x 12" x 24", which would reduce the effect of any larger pieces causing the large pockets of air.

In fact, it is questionable why the NIST made the width specification for measuring a 1 c.f. bag different than that for measuring 2 c.f. and 3 c.f. bags. The NIST made the measuring box for 2 c.f. and 3 c.f. bags so that one box can be used for measuring both size bags, but why did it make the width for the 1 c.f. measuring box different, while at the same time creating a situation where the public is buying air in the 2 c.f. and 3 c.f. bags? Obviously, the measuring box for all 3 size bags should be the same length and width, and only different in height. This box should be 12" x 12" x 36".

ATTACHMENT # 2 - JUSTIFICATION

In Amerigrow's opinion, the procedures used for the measurement of volume of bagged mulch in accordance with the NIST Handbook 133 implemented 10 years ago, are outdated, inconsistent, and questionable and resulted in Amerigrow's bags failing a Florida Department of Agriculture, Division of Weights & Measures, measurement test.

In November 2007 a lawsuit was filed against Amerigrow Recycling and 5 other defendants for "deceptive and unfair trade practices" in the production and sale of bagged mulch. Subsequently, the plaintiff and their attorneys filed with the Court to convert this to a class action lawsuit against the defendants. This lawsuit, which was dismissed by the Court in July 2009, cost our company well in excess of $75,000 to defend, and in all likelihood, the cost to all defendants was in excess of $500,000 which does not include the cost of company personnel providing information and support to the attorneys.

Tests in December 2007 by the Florida Department of Agriculture, of bags of mulch produced by the 6 defendants and located at the plaintiff's place of business, found many of the bags short packed, and these tests became the cornerstone for furthering the lawsuit and opening the door for certifying the class action.

Amerigrow cannot speak for the other defendants in this lawsuit, but obviously can in regard to our own bags failing the measurement tests. If the procedures for the measurement of bag mulch are not updated ASAP, failed tests will increase and the cost associated with these failed tests, including legal fees such as those having to be absorbed by Amerigrow and its co-defendants in this lawsuit, will occur more often and nationwide and reputations will be unjustifiably ruined.

Home Gardeners Headline Newsletter
Summer 2004

In this newsletter:
(Click on a topic to go directly to it.)

Dear Home Gardener,

This has been an interesting spring in Berks County. We've had infestations of cicadas and of cankerworms in certain areas, but these pests-despite all the media hype-have been invisible over much of the county.

We've had multiple storms-but again, the effects have been spotty. Until recently, some areas were quite dry, while others were soggy. Steady rainfall in early June has now replenished our aquifers and we're going into the heat of summer in good shape nearly everywhere in the county.

With the spring lawn and garden work behind us, it's time to savor the results. Vegetables are coming on strong, flowers are lush, and lawns are green. Now is the time to enjoy gardening events that celebrate our abundance: strawberry festivals, garden tours, the Master Gardener Demo Garden Open House, and of course our county fair.

Happy Gardening!

Beth Finlay, Master Gardener Coordinator
Nancy Bosold, Extension Educator

Correction

In the spring issue, we printed an article on "Lawn Management Through the Seasons." It stated under the mowing section that you should cut your lawn to 1½ to 2 inches. This should have read 2-3" for most home lawns. At 2-3", you'll have better weed management and turf survival through the seasons.

Nancy Bosold, Extension Educator Turfgrass Management

Nuss says orchids, tulip bulbs, chrysanthemums, and dahlias can be allergenic to some individuals.

Skin irritant plants. The chemicals that plants have in leaves, bark, roots, bulbs, or flowers can cause direct skin irritations. "In many cases, the sap within the plant is the cause of the problem," Nuss explains. "Often the irritating substance is released only when the plant tissue has been damaged or mishandled."

Nuss says some common houseplants can cause skin irritation, including poinsettias, penciltrees, daffodils, hyacinths, and ornamental buttercups.

Stinging plants. Most nettles can cause a toxic reaction when touched, but the reaction does not have lasting effects and requires no medical treatment.

Thorny plants. The most common plant-related injuries are caused by thorns. "Most people don't seek medical help after getting stuck by a thorn," Nuss says. "But implanted thorns, needles or spines can cause infections or other medical problems."

Nuss says thorns embedded near joints can cause chronic arthritis. Thorns embedded near bones can mimic a bone tumor. Thorny plants that can cause painful injuries include roses, black locust and honeylocust trees, and blackberry bushes.

"Clothing, tools, and even smoke from burning plants can carry toxins," Nuss says. "Be sure to wash all clothing and tools after working with problem plants. The residues can be hazardous for a long time."
Source: Penn State University PenPages

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What Is Growing In My Landscape Mulch?

Landscape mulches are used to protect soil, conserve moisture, moderate soil temperature, and limit weed growth, as well as beautify and unify landscape plantings. Most mulches are mixtures of shredded wood and bark residues from lumber and paper mills, arboricultural and land-clearing operations, and wooden pallet disposal or recycling facilities.

Like other organic matter, wood and bark decompose over time. The primary organisms involved with their decomposition are bacteria and fungi, which derive their energy for growth from the carbon-based compounds found in wood and bark. These compounds include cellulose, lignin, and simple sugars. Bacteria are microscopic organisms that are not visible in the mulch. Fungi also may be microscopic, but many develop visible reproductive structures.

The fungi involved in the decomposition of landscape mulches are natural components of the mulch environment. Some fungi, such as the artillery fungus, are "recyclers" and break down woody tissue directly. Other fungi, such as slime molds, consume bacteria and other organisms living in the mulch. These fungi are not harmful to landscape plants, and no known health hazards are associated with them unless they are eaten. They can be found from April through October, usually following rainy weather.

ENH103

UF UNIVERSITY of FLORIDA
IFAS Extension

Mulches for the Landscape[1]

Robert J. Black, Edward F. Gilman, Gary W. Knox and Kathleen C. Ruppert[2]

A mulch is any material applied to the soil surface for protection or improvement of the area covered. Mulches are frequently applied around plants to modify the soil environment and enhance plant growth. The mulch material may be organic such as bark, wood chips, leaves, pine needles, grass clippings or similar material; or inorganic such as gravel, pebbles, polyethylene film or woven ground cloth.

BENEFITS OF MULCHING

Mulching has the following beneficial effects upon the soil and plants.

- Mulches can prevent loss of water from the soil by evaporation. Moisture moves by capillary action to the surface and evaporates if the soil is not covered by a mulch.
- Mulches suppress weeds when the mulch material itself is weed-free and applied deeply enough to prevent weed germination or to smother existing small weeds.
- A more uniform soil temperature can be maintained by mulching. The mulch acts as an insulator that keeps the soil cool under intense sunlight and warm during cold weather.
- Mulching will prevent crusting of the soil surface, thus improving absorption and percolation of water into the soil and, at the same time, reducing erosion.
- Organic materials used as a mulch can improve soil structure and tilth. As mulch decays, the material becomes topsoil. Decaying mulch may also add nutrients to the soil.
- Mulches also add to the beauty of the landscape by providing a cover of uniform color and interesting texture to the surface.

1. This document is ENH103, one of a series of the Environmental Horticulture Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Original publication date March 1992. Revised March 1994. Reviewed October 2003. Visit the EDIS Web Site at http://edis.ifas.ufl.edu.

2. Associate Professor & Associate Professor, Environmental Horticulture Department; Associate Professor in Environmental Horticulture, North Florida Research and Education Center; and Assistant Professor, Environmental Horticulture Department, Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville FL 32611.

Bagged mulch is also available in amounts such as 1.25 cubic feet or 2.0 cubic feet. If you purchase the mulch needed for the shrubbery example given above in amounts of 1.25 cubic feet, you will need 20 bags (25 cubic feet r 1.25 cubic feet = 20 bags). If you purchase bags of 2.0 cubic feet, you will need 12.5 bags (25 cubic feet r 2 cubic feet = 12.5 bags). Therefore, you will purchase 13 bags.

However, as discussed above, always remember to pull mulch 1 to 2 inches away from the stems and trunks of plants to lessen the chances of stem or trunk rot. So, whether the shrubs are single or multi-stemmed, you will not need all of the mulch determined above; the calculations did not include either the area used by the stems and/or low branches, or the extra 1 to 2 inches around the stem(s). Therefore, you can purchase less mulch than the calculations indicate. If you are using an organic mulch and buy more bags than you need, return the extras for a refund, if possible (check store policy). Do not store organic mulches, because they will rapidly decompose in the bag. Inorganic mulches, however, may be stored.

REFERENCES

Khatamian, H. 1985. "Mulching-how, when, why and with what". *Grounds Maintenance* June: p. 102-104.

Stinson, J. M., G. H. Brinen, D. B. McConnell and R. J. Black. 1990. "Evaluation of landscape mulches". *Proc. Fla. Hort. Soc.* 103:372-377.

Amerigrow

STUDY OF DECOMPOSITION OF BAGGED RED & GOLD COLORED MULCH

On February 13, 2008 Amerigrow bagged two (2) pallets of red mulch and two (2) pallets of gold mulch. These 4 pallets were bagged in runs during which we more frequently sampled bags taken off the line to ensure a fill rate of 2 cubic feet per bag.

On March 28, 2008 we tested four (4) bags form the top of each of the four (4) pallets and measured their contents. The content for the gold bags measured an average of 1.725 cubic feet per bag and the red bags averaged 1.75 cubic feet per bag.

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