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Cannabis Waste Disposal ... A Growing Sector in Organics Recycling

BY P.J. HELLER

Their business may be going to pot, but that is fine with Jonathan Lee and Garrett Rodewald.

The co-founders of Gaiaca Waste Revitalization in California are among a growing group of entrepreneurs who are capitalizing on the need for companies to manage burgeoning amounts of cannabis waste.

“Somewhere right now, there’s a state talking about legalization; updating rules and regulations; and preparing to issue licenses to cultivation facilities, processing operations and dispensaries,” says Rich Thompson, managing partner of TEC, writing in Waste Dive. “All of this activity creates new opportunities for waste and recycling service providers to find ways to work within those complex local systems.”

Marijuana is currently legal in 11 states for adults over the age of 21 and legal for medical use in 33 states. Colorado was the first state to legalize pot in 2012.

Nationwide, sales of recreational and medical marijuana are expected to top \$15 billion in 2020, up about 40 percent from the previous year. In 2019, recreational marijuana sales in Colorado topped \$1.4 billion, a 16 percent increase over one year earlier. There are more than 1,000 licensed cannabis retailers throughout the Rocky Mountain state. In California, licensed pot sales in 2019 topped \$3 billion, about a 23 percent increase over 2018, the first year of licensed cannabis sales in the state (black market sales were estimated to be \$8.7 billion in 2019).

With those sales comes something more than just a high. There is also a high — make that huge — amount of waste, with estimates of more than 1 million tons of cannabis and hemp waste generated annually in North America.

“As the cannabis industry continues to prosper, the problem with regards to the cannabis wastes is also growing exponentially,



Gaiaca provides secure and lockable drums to its customers for cannabis waste accumulation. Photo courtesy of Gaiaca Waste Revitalization.

giving cannabis companies a real headache,” according to Gaiaca.

Rodewald, the chief operating officer at Gaiaca, estimates that for every pound of finished cultivated product, at least one pound of waste is generated.

Cannabis waste is any non-hazardous material that either contains cannabis or that has made contact with cannabis. That waste can include plant stems, leaves, trimmings, extracts, oils and packaging materials. Hazardous cannabis waste can include material spent organic solvents and refining chemicals, used reactants, compressed gases or aerosols, bulk or residual fertilizers, cleaning solutions, and universal wastes such as mercury-containing lighting, ballasts and batteries.

Gaiaca Waste Revitalization claims to be the nation’s first licensed cannabis waste disposal company. The company was started in 2016 “to create a sustainable solution for the quickly growing cannabis waste concern in California.”

“Sustainability is the motive and objective for a majority of cannabis operators. It’s something that they strive toward. But a lot of these cannabis operators don’t even know that there are recycling options for their cannabis waste,” Lee said in a recent interview.

California requires that any business involved in cannabis activities must properly manage and dispose of its cannabis waste. Typically, that will be done by landfilling, composting, anaerobic digestion or incineration. California, like Colorado, requires that all cannabis by-product must be properly rendered “unusable and unrecognizable.”

“The plants and products must be rendered unusable and unrecognizable,” according to the Colorado Department of Public Health and Environment. “This must be accomplished by grinding or compacting the marijuana waste and incorporating it with any non-consumable, solid wastes . . . The resulting mixture must be at least 50 percent non-marijuana waste and such that a resulting mixture cannot easily be separated and sorted.”

Once completed, the waste can be disposed of at a solid waste site, deposited at a compost facility or composted on-site at a facility owned by the generator of the waste.

The Massachusetts Department of Environmental Protection (MassDEP), meantime, bans disposal of cannabis plant material, which it considers “commercial organic material,” if a business generates 1 ton or more per week for disposal. *Continued on page 3*

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"If a marijuana establishment generates 1 ton or more of commercial organic material per week for disposal, it would need to divert this material from disposal, typically to a compost or anaerobic digestion operation," state officials advise. "If a marijuana establishment generates less than 1 ton of plant material per week, the material may be disposed of in the trash, although MassDEP still encourages this material to be composted where possible

Lee, the chief executive officer of Gaiaca, estimates his company has composted 5 million pounds of cannabis waste, most of it from plant waste. That cannabis waste is blended with ag waste and goes through a two-week fermentation process. The resulting material is donated to landscapers and community gardens and provided to researchers studying the how soil containing cannabis waste affects the growing of produce.

Gaiaca, headquartered in Gonzales, CA, utilizes a 30-acre compost facility for non-hazardous cannabis waste. Waste that cannot be composted is used for fuel blending which can then be burned to create energy, according to Maria Espinoza, director of business development at Gaiaca. The company recently opened another office in Los Angeles and has plans for a location in New York. It also serves clients in Nevada, Florida and Arizona.

Espinoza says Gaiaca in 2018 launched the nation's first vape pen recycling program. More than 3 million pens and cartridges have been recycled, she reports.

Cannabis waste disposal companies offer customers various service options, from a membership subscription plan to one-off pickups.

States have varying regulations and departments to oversee the cannabis industry. In California, the industry falls under the Bureau of Cannabis Control within the Department of Consumer Affairs, the Manufactured Cannabis safety Branch housed in the Department of Public Health and CalCannabis Cultivation Licensing within the Department of Food and Agriculture. Each agency has its own set of regulations with different waste management requirements.

In Colorado, cannabis operators have to answer to the Marijuana Enforcement Division in the Department of Revenue and the Department of Public Health and Environment.

There are also myriad regulations by local city and county jurisdictions with which to deal.

Gaiaca and other cannabis waste disposal companies say their services can help the industry navigate the regulatory maze, allowing cannabis operators to concentrate on their business.


"Make no mistake," warns Cannabis Waste Recycling in Santa Ysabel, CA. "Whether you call it weed, cannabis, or plain medical marijuana, it and its byproducts must be properly disposed of. Discarded cannabis or cannabis products in the wrong hands can signal unwanted problems for your business."

"Regulatory compliance can be confusing and unclear, especially in a new, burgeoning industry such as cannabis, making regulatory compliance of utmost importance," Gaiaca adds. "Having serviced all facets of the industry from cultivators, manufacturers, distributors, retailers and testing labs, we have the solutions to make the regulatory compliance an easy and clear process. We handle all the hard work with cannabis waste, so operators can focus on what they do best."

EcoWaste in Southern California makes a similar pitch.

"Cannabis waste is a discussion that most operators don't know they need to have," the company says. "We aim to educate the cannabis industry with the right knowledge and provide a solution that is effective and embraces the regulations."

Demand for cannabis waste disposal is only expected to increase in the years ahead as demand for weed grows and as more states consider legalizing pot. Predictions are that cannabis sales could top more than \$37 billion by 2024, according to the Marijuana Business Factbook.

"Cannabis waste disposal has become a viable business," Gaiaca officials say. "As the number of dispensaries, testing labs, distributors, retailers, manufacturers, cultivators, and cannabis handlers acknowledge the benefits of working with a certified cannabis waste disposal company increases, more and more investors are also getting interested in opening their own waste disposal company. This is made evident by the growing number of new businesses offering a wide range of cannabis waste disposal solutions in California." 



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Organics Recycling on the Map Across Canada

National Facility Survey Results and Regulations & Guidelines just some of the details provided in Compost Council's web-based information service at www.compost.org

Summary results of the recent national survey of organics recycling survey conducted by The Compost Council of Canada are now being shared on www.compost.org. Summary information about many of the centralized composting and anaerobic digestion facilities in Canada along with information concerning regulations, guidelines and other information documents that impact the current and future development of the Canadian organics recycling industry are also being identified through an interactive map according to province and the territories.

"This public information service has been created by The Council to not only acknowledge the tremendous achievements of our industry to-date, but also support all organics recycling advocates as we continue working towards realizing our industry's full potential," declared Larry Conrad, Chair, National Board of Directors, The Compost Council of Canada.

"From a national diversion total of 275,000 tonnes in 1992/1993, our current survey indicates that over 5.3 million tonnes of organic residuals are now being processed annually across Canada," said Susan Antler, Executive Director. "Considered as a fundamental essential community service, organics recycling programs, whether supported by composting or anaerobic digestion technology or their combination, have resulted in organic residuals being the #1 material recycled by tonnage in Canada. And yet, the opportunity remains for further exponential industry growth which could double existing capacity."

The upcoming 30th Annual Organics Recycling Conference and 1st Virtual Conference of The Compost Council of Canada — *THE FUTURE STARTS HERE* — will be held during the week of Sept. 28 - Oct. 2, 2020.

For more information and to access the map of organics recycling facilities across Canada, please visit www.compost.org.

Black Hills National Forest Harvest Hoped to Prevent Infestation

RAPID CITY, SD — Loggers are racing to remove as much storm-damaged Ponderosa Pines in South Dakota's Black Hills National Forest (BHNF) before the wood becomes a feast for insects, according to an **KNBN NewsCenter1** report and the U.S. Forest Service website.

The salvage operation began on July 20 after tornadoes decimated nearly 1,000 acres earlier that month. The Forest Service estimates some 8,000 or 9,000 centum cubic feet (1 CCF = 100 cubic feet) of the fallen trees will be harvested and sent to local mills.

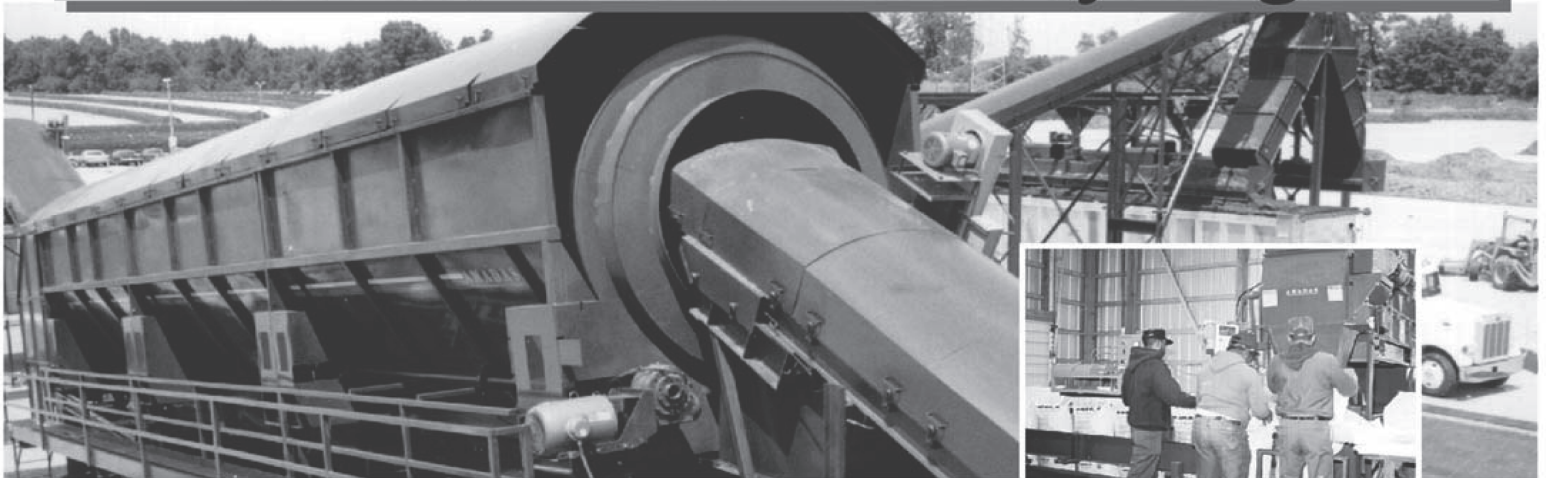
Meanwhile, sustainability experts are questioning the practice of harvesting storm-damaged timber. In March, Rocky Mountain Institute (RMI), an independent, nonpartisan nonprofit, drafted a report on the current state of timber harvest in the BHNF. The RMI report concluded that the business practice is not sustainable and may lead to forest depletion in the next few decades.

The current rate of sawed timber harvest is 153,534 centum cubic feet in the Black Hills forestlands. The allowable 181,000 CCF outlined in BHNF's plan, which was drafted in the 1990s, would mean a total of 12 million CCF of standing trees are needed in order to maintain sustainability. Currently, standing timber is at 6 million CCF. According to RMI, the Forest Service needs to decrease harvest rates or risk having fewer and fewer harvestable trees in the next few decades.

The forestry industry represents \$120 million in revenue and 1,400 jobs to the local economy. The Black Hills provides 80 percent of the timber.

The Forest Service is working with stakeholders on a solution for Ponderosa Pine management.

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C of A is short for **Certificate of Analysis**. Just as nutritional information on food labels helps people control their diets, an **AgriCoatings** C of A provides information to assist mulch manufacturers control colorant costs.

Density and Viscosity.

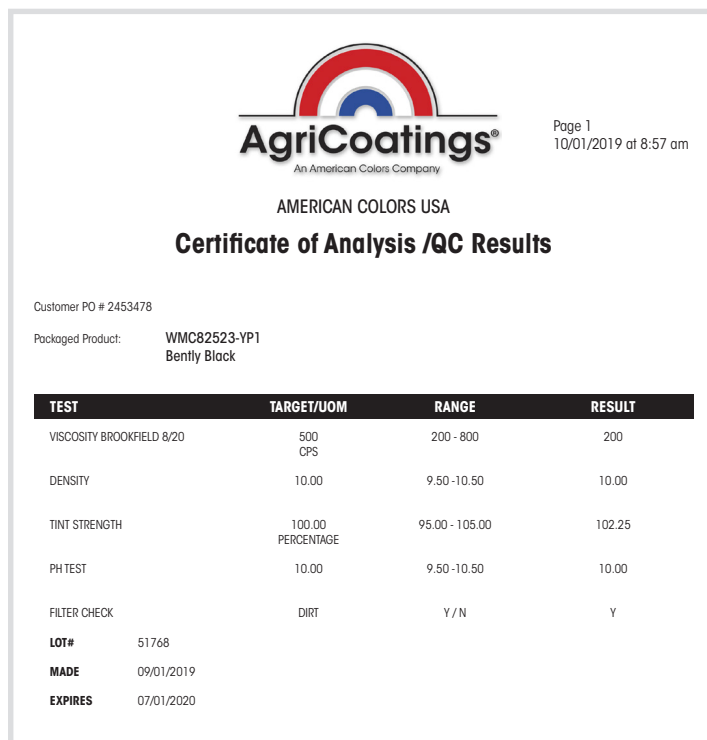
Although mulch colorants are purchased by the pound, they are consumed by the gallon. When a mulch producer sets the desired color, regardless if by a peristaltic pump or a mixing chamber, it is imperative to know how much color is being applied and the cost associated with it. By using a product with uniform density and consistent viscosity batch to batch color costs can be more accurately established.

Tint Strength and Filter Checks

Consistent tint strength helps the mulch producer make consistent colored mulch. Tint strength is determined by comparing a specific batch against a liquid standard. While processing pigments, AgriCoatings periodically takes color readings, examines the mill filters for particle size and then adjusts the color; maximizing pigment efficiency. The dispersion of the pigments allows the color system to adequately cover the mulch. Some people refer to this as "hide".

C of A's offer the mulch producer important data and assures, with relative certainty, that the next batch will be the same as the last. An **AgriCoatings Certificate of Analysis** is a straight forward document, easily understood and is provided with every shipment...at no charge. Publicizing this report requires us to be ever vigilant in our practices and procedures.

If your colorant supplier does **NOT** provide a Certificate of Analysis, ask **WHY?**



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VISCOSITY BROOKFIELD 8/20	500 CPS	200 - 800	200
DENSITY	10.00	9.50 -10.50	10.00
TINT STRENGTH	100.00 PERCENTAGE	95.00 - 105.00	102.25
PH TEST	10.00	9.50 -10.50	10.00
FILTER CHECK	DIRT	Y / N	Y
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Dealing With Food Waste During the Pandemic

This year, the volume of compost is rapidly increasing as stay-at-home mandates relegate Americans to stay home, eat and venture into their yards.

Countless municipal composting programs are on hold through the COVID-19 pandemic across the country.

For example, Fairfax County, Virginia temporarily suspended its curbside food waste collection. Coronavirus-related budget cuts caused New York to pause all compost collection as of May 4. Prior to that, the city had been spending much more on the program than it had earned as part of an effort to reduce landfill waste 90 percent by 2030.

In California, statewide mandatory composting rules will require all local governments to divert food waste from landfill by 2022. Municipal and community composting programs are operating in the most populous areas. San Francisco's composting program is selling the city's compost to farms or vineyards. A Los Angeles community collaborative program, LA Compost, is teaching people how to turn food and green waste into a rich amendment that can be used yards, gardens and local parks. The state has a number of anaerobic digesters to consume food waste that doesn't get made into compost.

Yet "food waste" has taken on another meaning as the nation's producers, wholesalers, and grocers grapple with logistics and market issues leaving them with excess foods. According to an article on **TheCounter.org** website, the U.S. Department of Agriculture has allocated \$19 billion as part of the Coronavirus Food Assistance Program to distribute fresh food boxes to food banks and faith-based organizations serving families in need.

Dairy Farmers of America, the nation's largest dairy co-op, diverted almost 250,000 gallons of milk to food banks; and companies like supermarket chain Publix purchased excess milk and produce from farmers and donated it to food banks in the Feeding America network.

Morbark Announces Leadership Change

Bradley Boehler to Succeed Dave Herr as Vice President of Forestry and Tree Care Group and President of Morbark Holdings

WINN, MI — Morbark, a manufacturer of equipment used in forestry, recycling, tree care, landscaping, sawmill, and biomass markets, recently announced the appointment of Bradley (Brad) Boehler as the successor to current Vice President of Alamo Group's Forestry and Tree Care Business Unit and President of Morbark Holdings, Dave Herr, effective August 24, 2020.

Before joining Alamo Group, Boehler was President of the Skyjack Group, a major Canadian manufacturer of aerial lift equipment, including scissor lifts and telehandlers. Before joining Skyjack, he worked for seven years at Tigercat International Inc., in various engineering and technical positions. Tigercat is a privately owned Canadian manufacturer of forestry equipment and specialized off-road industrial machinery.

He is a veteran of the Canadian Armed Forces, having served as an Engineering Officer in the Construction Engineering Section. He holds a Bachelor of Engineering Science in Civil Engineering granted by the University of Western Ontario and has completed the Executive Development Program at the Ivey Business School. Brad, who hails from Alberta Canada, and his wife Melinda, will be relocating to Central Michigan in the coming months.

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2020 Wood Recycling Volumes Rise in UK

BRISTOL, ENGLAND — The amount of waste wood processed in the UK increased by six percent to approximately 4.4 million tons US in 2019, according to new figures from **Wood Recyclers Association (WRA)** membership survey.

The upward trend is not sudden. June numbers released by WRA show the amount of waste wood processed increased from 4.1 million tons US in 2018.

In fact, processed waste wood volumes in the UK have been going up steadily in the past decade. In 2011, nearly 3.2 million tons were calculated for the year.

WRA's latest statistics also indicate that waste wood is increasingly being converted into Chapter IV biomass – the European classification for biomass feedstocks that are burned for energy. Volumes of those products rose by almost 14 per cent, to 2.6 million tons more than last year. The amount of waste wood processed into small-scale biomass also increased by 39 percent across the UK.

Meanwhile, exports of waste wood across the UK fell steeply by 39 per cent from some 345 tons in 2018 to about 21,000 tons in 2019.

Close to 5 million tons of waste wood is available in the UK, with a high percentage of it now being recycled or reprocessed. This year's survey showed that WRA members processed more than 3. tons of waste wood, an increase of 4.3 percent from 2018.

Waste wood being processed into animal bedding, equine surfaces and other recycled products fell by 18 per cent across the UK, while waste wood processed by the panel and board industry rose by 12 percent. Both use Grade A packaging materials, the WRA report noted.

Another finding of the survey was that the UK is importing more wood waste from offshore – imports rose to over 20,000 tons in 2019. This volume is expected to grow as a result of Household Waste and Recycling Centres (HWRCs) closures across the UK.

Company Turns Old Pallets into Profits

PITTSVILLE, WI — A small company has been achieving big zero waste results by turning worn, broken pallets into fuel for bioenergy, bedding for cattle, and metal for recycling, reports.

In the early 2000s, Hay Creek Pallet was building and repairing pallets. This remains a core business where Central Wisconsin's mix of forestry and agriculture drives a consistent demand for specialty pallets.

But then Hay Creek entered what became a new niche – recycling. As market demand for colored mulches rose, the company began taking in various forms of wood waste from other pallet manufacturers, sawmills, and wood products companies to produce this landscaping product. Within a few years, the company expanded its mulch production and also began recycling wood waste for cattle bedding and biofuel.

Since getting into pallet recycling in the mid-2000s, Hay Creek has made a number of wood grinder upgrades. The company also purchased equipment for grinding and coloring pallet scrap to produce colored landscape mulch.

Recently, Hay Creek invested in a new horizontal grinder, installing it at the company's main plant. Broken wood pallets are loaded into a grinder and the machine grinds them into wood shavings to be made into fuel pellets or into a fine cattle bedding material that is long-lasting and absorbent (tested to have a 12-14% moisture content).

In addition to recycling the wood, the facility's seven-step metal extraction process removes nails and other metal during processing, which the company sells for recycling.

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Maryland Mulch Fire Caused by Cigarettes Results in \$1.3M Verdict

ANNAPOLIS, MD — A Maryland judge ruled that a landowner has a legal obligation to prevent risk of fires that could damage neighboring properties, reports a *Legal Newsline* article.

On July 27, a Maryland Court of Appeals judge ruled against a labor union that knew its members were discarding cigarettes in a mulched common area along a property line. Hundreds of cigarettes were found in the mulched area between a lot owned by the Steamfitters Union Local 602 and a property owned by Gordon Contractors. In 2015, a fire that began on the union's property spread along a fence between the two lots, damaging Gordon's property and another adjacent lot.

Steamfitters UA Local #602 represents the Journeymen, Apprentices and Helpers, who work in the Heating, Air Conditioning, Refrigeration and Process Piping Industry in the Washington, DC Metropolitan area. Apprenticeship training classes are held at the hall where the fire began. Trainees are known to congregate outside, many of whom smoke.

An investigation turned up hundreds of cigarette butts in the mulch. Gordon's insurers sued Steamfitters for almost \$1.3 million, and they were successful in a jury trial. Steamfitters appealed and lost in the Court of Special Appeals and, now, the state's highest court.

In the decision, the judge said the Steamfitters could have exercised numerous options to prevent the fire, such as implementing a no-smoking policy on the property, removing the mulch, creating a designated smoking area in another location on the property where the ground material did not consist of combustible materials, "or any number of reasonable options in light of the activity that Steamfitters knew, or should have known, was habitually transpiring on its property."

Atmospheric Effects of Methane from Cattle Ranches – a Myth?

According to a University of California study, methane produced by cattle ranches may not be nearly as harmful to the climate as is commonly suggested, reports *Farm Guardian Insight*.

Professor Frank M. Mitelhoener, air quality specialist at the University of California, speaking at a Farm Advisory Service webinar, said it was important to understand the biogenic carbon cycle as it applies to ruminant livestock.

Indeed, under certain circumstances it could have a cooling effect on the atmosphere. While carbon produced by cars remains "stocked" in the atmosphere for about 1,000 years before it is degraded, methane produced by cattle is a "flow" gas.

The UC professor thinks that the biogenic carbon cycle is impacted by the size of cattle herds. If ranchers keep herd numbers static, the methane in the atmosphere remains correspondingly the same.

Methane breaks down within about 10 years with the resulting CO₂ being absorbed by the plants being grown to feed the cattle. Methane does contribute to warming of the atmosphere. Thus, reducing cattle numbers will reduce methane production.

The theory is that if methane production from the present number of cows in the world could be reduced by 35 per cent the effect it would actually have would be a cooling effect on the planet.

This could be achieved in a number of ways, including dietary changes and vaccines, but the use of covered slurry stores linked to anaerobic digestion plants has been proven to be highly effective.



ANNOUNCING



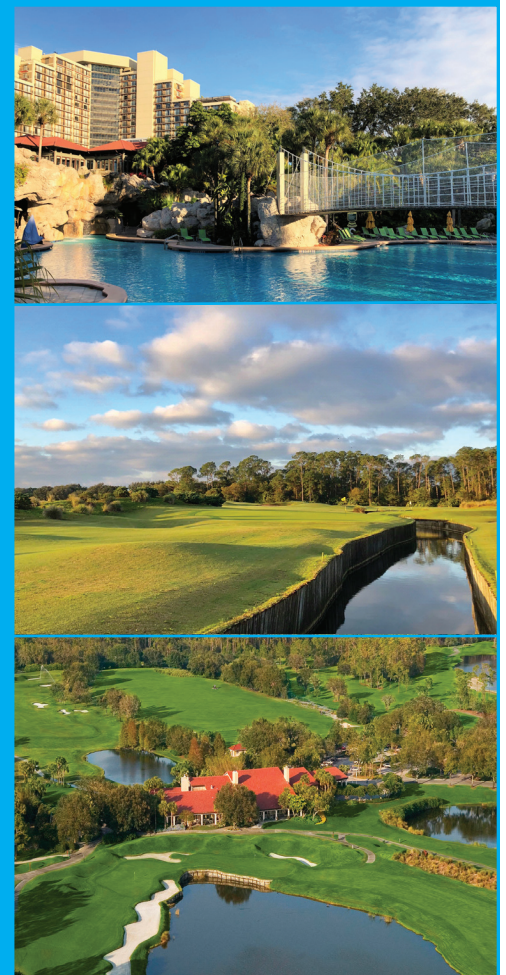
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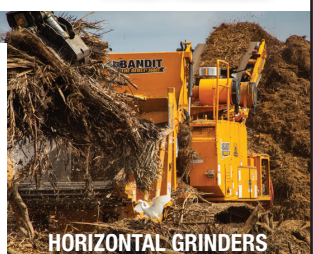
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News From The Mulch & Soil Council

BY ROBERT LAGASSE, EXECUTIVE DIRECTOR

MSC LIMITED, HYBRID Annual Meeting

The 49th Annual Meeting of the Mulch & Soil Council has been redesigned and relocated as a special HYBRID (IN-PERSON or ON-LINE) LIMITED Special Event on Oct. 6 & 7, 2020.

Because of potential Covid-19 exposure, group meeting limitations and potential civil unrest for the planned Charlotte, NC, meeting venue, the MSC annual meeting has moved to a gated resort on 1,500 private acres at the Hyatt Regency Grand Cypress in Orlando, FL. This facility offers more isolation with world-class recreation and meeting facilities under full CDC and state health protection protocols.

For those who are restricted from (or are just not ready to) travel, the Council will provide an ON-LINE access for our (Limited) 2-hour program you absolutely won't want to miss. For information visit mulchandsoilcouncil.org/meetings.php.

MSC / NIST Uniform W&M Training

Since testing the package fill of mulch and soils is often done outdoors, a significant number of states took advantage of the opportunity to test industry products. A new test procedure was approved by the National Conference on Weights & Measures (NCWM) in 2018, and it is interesting to see some significant procedural issues remain that result in improper "Off-Sale Orders".

In discussing these unexpected errors with the experts at the Office of Weights & Measure (OWM) at the National Institute of Standards & Technology (NIST), it was clear that not all parties in state governments and industry have been fully trained on the clarified procedures in NIST Handbook 133 for "Checking Net Contents of Packaged Goods". No one can argue that it is essential that industry and regulators must be uniformly trained on product package inspection procedures. So, MSC Executive Director Robert LaGasse and NIST OWM Instructor David Sefcik have teamed up to produce a uniform training program for mulch and soil product testing for regulators and industry.

The program is comprised of 6 instructional modules including:

- Module #1: Method of Sales & Test Procedure for Packages of Mulch & Soil Labeled by Volume
- Module #2: Method of Sale
- Module #3: Labeling Requirements
- Module #4: Test Equipment
- Module #5: Test Procedure: Section 3.10.2
- Module #6: Evaluation of Test Results

The instruction program is expected to be completed in late August and is scheduled to be used in NIST training programs for state regulators in October and November. The Mulch & Soil Council also plans to utilize these new instruction modules in October and November in a new series of webinars for Council members. For more information, contact the Council at info@mulchandsoilcouncil.org or 806-832-1810.

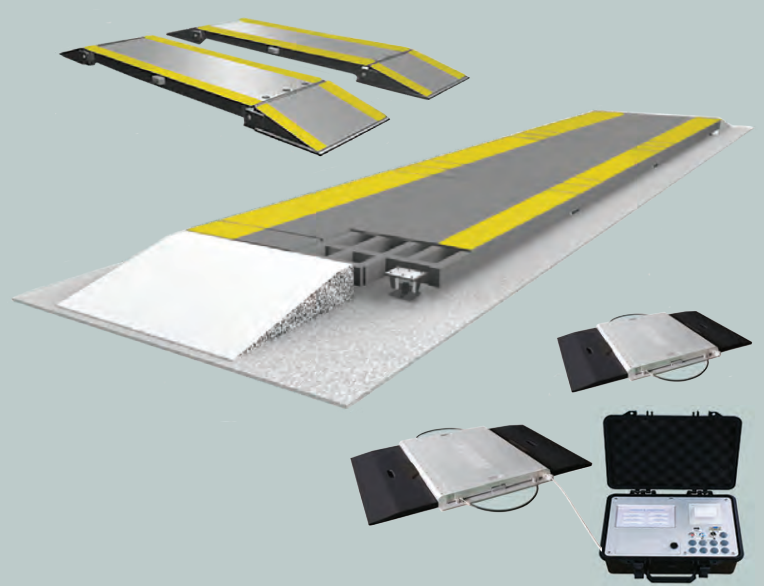
Covid-19 Impact Study

It has been a very busy season for mulch and soil producers in spite of the state-to-state confusion over Coronavirus lockdowns.

We should note that historic industry data shows that 50% of mulch & soil industry shipments occur from March through May. The total grows to 60% by the end of June; so, the highly variable and often changing state rules on essential businesses and consumer lockdowns could have disrupted our extremely short, seasonal market with a devastating impact on the industry.

Continued on page 14

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News From The Mulch & Soil Council

Continued from page 12

While most states allowed home centers, mass merchants and outdoor garden centers to fill the public's demand for vegetable gardening and other landscape activities, a few states (like MI, VT, PA and in some respects NY) delayed designating garden centers as essential businesses. Even so, a recent survey of the members of the Mulch & Soil Council showed positive sales growth over last year for the period January thru June.

Raw data from the June survey of MSC members on product sales, pandemic response and other issues is being analyzed, and a report is expected to be presented or available at the 49th MSC Annual Meeting in Orlando, FL, in October.

About MSC

The Mulch & Soil Council began in 1972 and is the national association of producers of horticultural mulches, consumer potting soils and commercial growing media. Its mission is to define quality products and promote an open market and fair competition. The Council's Product Certification for bagged mulch and soil and its Elite Bulk Member programs are designed to inform buyers of manufacturers that support and comply with industry product standards and are willing to submit to testing and verification in the best interests of the industry and its customers.

To learn more about the Mulch & Soil Council, visit mulchandsoilcouncil.org. To become a member, call 806-832-1810.

Pellet Production

NINETY SIX, SC — A town in the western corner of South Carolina is considering a proposal for a new wood recycling plant, reports the *Index Journal*.

In May, US Biomass LLC, a startup company, pitched its plan to build a wood pellet manufacturing facility to Greenwood County Planning Commission. In June, the company filed an application for a request to rezone the 31.80 acres from agricultural to light industrial use.

Waste wood from logging operations would be converted to wood chips, then transported to the facility in Ninety Six to be made into wood pellets.

US Biomass Chief Operating Officer Martijn Van Zadelhoff said the operation would produce wood pellets for fuel. The first phase of construction would create 30 jobs, paying between \$18-20 per hour. Zadelhoff, who also owns Amsterdam Lumber Co., is associated with real estate development and retail businesses in the area.

Once US Biomass clears the permitting and rezoning process, it will become part of the area's burgeoning pellet production industry, joining the largest producer of wood pellets, Enviva. In 2018, Enviva acquired Colombo Energy's Greenwood County wood pellet production plant in 2018 and is in the process of buying Enviva Pellets Greenwood Holdings, for \$132 million, according to an article in *Bioenergy-News*.

Enviva's current Greenwood facility has been operating since 2016. The company plans to invest \$28 million to expand the Greenwood plant's production capacity to 600,000 metric tons by the end of 2021, subject to obtaining the necessary permits.

US DOE Announces \$68m Fund for Bioenergy Crops Research

Over the next five years, the US Department of Energy (DOE) is investing \$68 million to fund research aimed at making bioenergy feedstock crops more productive and resilient.

Studies on common bioenergy feedstocks, including sorghum, pennycress, and poplar, will focus on complex interactions between crops, soil, and soil microbes that impact productivity and stress resistance. The research will combine controlled field studies with computational modelling.

According to a DOE official, one key requirement for sustainable bioenergy production is feedstock crops that can be grown on marginal lands that are not traditionally suitable for growing food. The aim is to understand the molecular mechanisms that lead to crops with greater productivity and survivability in stressful environments.

The funds are part of an overall \$93 million FY 2019 bioenergy technology package intended to support researchers under DOE's Biomass Component Variability and Feedstock Conversion Interface programming.

Under the biomass category, funds were awarded to Montana State University (\$1,300,000) and University of Wisconsin-Madison (\$1,248,748) for corn stover studies; University of Kentucky for investigation into pine wood residues (\$1,641,922); University of South Carolina for lignin research (\$879,000); Purdue University for feedstock conversion operation modeling (\$1,378,384); University of Georgia for a new method of analyzing biomass handling and conversion properties (\$1,451,342); and Penn State University, for research into characterization of biomass particle behavior.

Projects were chosen by competitive peer review, under a DOE Funding Opportunity Announcement for Systems Biology Research to Advance Sustainable Bioenergy Crop Development, sponsored by the Office of Biological for Environmental Research within the DOE's Office of Science.

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