



Independent coverage of composting, wood recycling and organics management



# Composting News

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## Maryland passes food waste diversion law

By Ken McEntee

Starting in 2023, certain Maryland entities that generate at least two tons of food residuals per week - and are within 30 miles of a composting or anaerobic digestion facility - will be required to separate the residuals from other solid waste following the passage of a bill by both houses of the state legislature.

HB264, which passed the House earlier this month, expands the diversion requirement to include generators of at least one ton of food residuals per week on January 1, 2024.

The new legislation compels entities who generate more than the specified quantity of food residuals to separate the food residuals from other solid waste and ensure that the food residuals are diverted from final disposal in a refuse

(See Maryland, page 13)



## New process hastens degradability of compostable plastics

Compostable plastics have been touted as one solution to the problem of plastic pollution bedeviling the world today, but researchers at the University of California, Berkeley say such compostable plastic bags, utensils and cup lids don't break down properly during typical composting, and contaminate recyclable plastics, creating headaches for recyclers.

Most compostable plastics, made primarily of polylactic acid, they said, end up in landfills where they can last as long as "forever plastics."

With U.S. Army funding, Berkeley scientists said they have invented a way to make compostable plastics break down within a few weeks with just heat and water - a shorter period of time



(Photo: UC Berkeley / Ting Xu)

(See Plastic, page 16)

## Composted manure may bolster food safety, research suggests

The application of properly composted animal manure to farm produce crops doesn't increase the survival of food borne pathogens, and may promote bacterial communities that suppress pathogens, according to new research done at University of California, Davis.

According to research done by a team headed by Naresh Devarajan, of the university's Department of Wildlife, Fish and Conservation Biology, recent foodborne disease outbreaks have caused farmers to reduce or eliminate the

application of animal-based compost because of concern that the soil amendments could introduce food borne pathogens onto farms and promote their survival in soils.

However, Devarajan's research

(See Safety, page 3)

### Highlights

- n East Coast grocer stops landfilling food waste
- n National compost prices

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Facilities

# Boulder, Colo. withdraws compost project

A controversial location for a new composting facility in Boulder, Colo. has been withdrawn from consideration by county commissioners.

As reported in the March issue of Composting News, Boulder County Commissioners earlier in March gave direction to county staff to withdraw Special Use Review and Subdivision Exemption applications for the proposed composting facility at the former Rainbow Tree Nursery site in unincorporated Boulder County. At the time, commissioners said the withdrawal doesn't necessarily mean that the project will not go forward, but that more time is



needed to look at all options as the county seeks solutions to divert more waste from landfills in pursuit of its "zero waste" goals.

Later in the month, commissioners said that after careful analysis of concerns identified during design development, including additional cost information, site-specific engineering

challenges, additional market analysis information and concerns expressed by the public regarding the process of community engagement, the commissioners have removed the site from consideration for the development of a compost facility.

While construction of a proposed facility will not move forward at that



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location, commissioners said in a statement, Boulder County remains committed to actively pursuing waste diversion solutions that will further the county's goal of "Zero Waste, or darn near," by 2025.

Commissioners said county staff from multiple departments are currently refining a work plan for pursuing that goal, which will include opportunities for public involvement. More information on potential solutions and engagement opportunities will be made available as they are known.

The regional Boulder County Compost Processing Facility had been proposed on the former 40 acre site nursery site and would have been designed to accept up to 50,000 tons of compostable feedstock - including yard trimmings, food scraps, animal manure and biosolids - annually.

Three county residents filed suit to stop construction of the site, alleging that the project violates county policy and state tax law. The suit also seeks a

permanent injunction to preserve a conservation easement previously placed on the property. The county purchased the easement for the property in 1994 and purchased the property and its water rights in 2018. The suit alleges that conservation easement should be terminated due to existing property restrictions.

During the special meeting on March 4, Jeff Maxwell, Boulder County public works director, said the county has received more than 500 comments - both in favor and opposed to the facility - from the public.

## Farming

### Safety

From page 1

suggests, "organic amendments (such as composts and cover crops) could bolster food safety by increasing soil microbial diversity and activity, which

(See Safety, page 5)



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## Farming

### Safety

From page 3

can act as competitors or antagonists and reduce pathogen survival.”

The researchers noted that proper composting techniques are known to reduce pathogen populations in biological soil amendments of animal origin, which can reduce the risks of introducing pathogens to farm fields in soil amendments.

“Thus, animal-based composts and cover crops may be a safe alternative to conventional fertilizers, both because of the known benefits of composts for soil health and because it may be possible to apply amendments in such a way that food-safety risks are mitigated rather than exacerbated,” the research said.

The research was published in February in the *Journal of Applied Microbiology*.

Leveraging a study of a 27-year

experiment comparing organic and conventional soil management, researchers evaluated the impacts of composted poultry litter and cover crops on soil chemistry, bacterial communities and survival of *Salmonella enterica* and *Listeria monocytogenes*.

“We found that bacterial community composition strongly affected pathogen survival in soils,” the paper said. “Specifically, organic soils managed with cover crops and composts hosted more macronutrients and bacterial communities that were better able to suppress *Salmonella* and *Listeria*. For example, after incubating soils for 10 days at 20°C, soils without composts retained fourfold to fivefold more *Salmonella* compared to compost-amended soils. However, treatment effects dissipated as bacterial communities converged over the growing season.”

Food borne disease outbreaks associated with the consumption of fresh produce have emerged as a major public

health concern, according to the World Health Organization (WHO). In the U.S., researchers said, 24 814 illnesses and 88 deaths were attributed to fresh produce between 2000 and 2015, the U.S. Centers for Disease Control (CDC) reported last year. More than 80 percent of those cases were attributed to three pathogens - *Listeria monocytogenes*, *Salmonella enterica* and Shiga toxin-producing *Escherichia coli*.

“While food borne pathogens can enter and contaminate farms through a variety of pathways, animal-based soil amendments represent particular cause for concern,” researchers said. “Many studies document a higher prevalence of food borne pathogens in fields amended with raw animal manures relative to conventional fertilizers... That said, the risk of introducing pathogens onto farms can be mitigated through proper composting techniques.”

Still, citing concerns about

(See Safety, page 8)

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# National Compost Prices

The prices listed below are intended to indicate the value of mature compost products sold by compost producers and retailers in noted regions. Prices listed are based on surveys and publicly posted prices.

Your input on published prices is encouraged. Contact Ken McEntee, editor, at (440) 238-6603. Fax: (440) 238-6712. EMail: ken@recycle.cc. Address: 9815 Hazelwood Avenue, Cleveland, OH 44149. Notes on listings.

- Each listing includes a high price obtained, a low price obtained and an average of all prices obtained within a particular market.

- Market areas: Thirteen market areas have been targeted to provide a cross section of compost product markets in

the U.S. Where regions are not identified by a specific city, "Chesapeake" refers to the region stretching between Norfolk, Va. to Baltimore, Md. "Texas" incorporates several major cities in the state. "Northwest" represents the Seattle and Portland, Ore areas. "SF-Bay" refers to the San Francisco Bay area. SoCal is Southern California, including the Los Angeles and San Diego areas. Denver includes Colorado, Wyoming and Montana.

- "Food waste" compost: This category refers to compost products that include food waste, regional specialties and other feedstocks not specifically covered in other categories.

- Manures: Chicken manures may include other poultry

manures, such as turkey and duck manure. Cow manures may include manures marketed as steer and dairy manure. Horse manure is included in this category as well.

- Absence of a regional listing within a given category indicates not enough information for a valid listing.

Additional data will be added as more information is obtained.

- Bulk retail prices do not include municipal operations that give compost away for free.

## Bulk Retail (yard)

Yard waste compost	Average	High	Low
NE	\$ 32.55	\$ 77.00	\$ 17.50
Chesapeake	\$ 24.50	\$ 30.00	\$ 17.00
SE	\$ 21.88	\$ 29.95	\$ 16.00
Florida	\$ 16.42	\$ 26.00	\$ 10.50
Cleveland	\$ 19.90	\$ 28.00	\$ 12.50
Iowa	\$ 21.57	\$ 53.00	\$ 7.50
Minneapolis	\$ 17.09	\$ 28.00	\$ 8.00
Texas	\$ 29.71	\$ 40.00	\$ 15.00
Denver	\$ 20.31	\$ 31.00	\$ 12.00
Northwest	\$ 24.05	\$ 55.00	\$ 10.00
SF-Bay	\$ 21.92	\$ 30.00	\$ 10.00
SoCal	\$ 14.75	\$ 24.00	\$ 8.00

Food waste compost	Average	High	Low
NE	\$ 39.12	\$ 64.00	\$ 17.50
Chesapeake	\$ 23.00	\$ 30.00	\$ 15.00
SE	\$ 28.11	\$ 35.00	\$ 24.00
Florida	\$ 17.50	\$ 22.00	\$ 13.00
Iowa	\$ 25.00	\$ 65.00	\$ 15.00
Minneapolis	\$ 12.33	\$ 16.00	\$ 9.00
Texas	\$ 30.21	\$ 48.95	\$ 15.00
Denver	\$ 15.00	\$ 15.00	\$ 15.00
Northwest	\$ 20.55	\$ 30.00	\$ 15.00
SF-Bay	\$ 23.61	\$ 38.00	\$ 14.00
SoCal	\$ 30.50	\$ 45.00	\$ 16.00

Leaf humus	Average	High	Low
NE	\$ 24.98	\$ 30.00	\$ 19.95
Chesapeake	\$ 27.49	\$ 30.00	\$ 23.95
Cleveland	\$ 19.27	\$ 26.00	\$ 8.00

Composted biosolids	Average	High	Low
NE	\$ 30.00	\$ 40.00	\$ 20.00
Chesapeake	\$ 24.98	\$ 35.00	\$ 12.00
SE	\$ 12.14	\$ 28.00	\$ 4.00
Florida	\$ 13.14	\$ 22.00	\$ 8.00
Cleveland	\$ 24.77	\$ 30.00	\$ 19.50
Iowa	\$ 12.67	\$ 21.00	\$ 8.00
Texas	\$ 21.28	\$ 30.00	\$ 10.00
Denver	\$ 9.00	\$ 10.00	\$ 7.00
Northwest	\$ 17.91	\$ 26.00	\$ 7.00
SoCal	\$ 13.36	\$ 22.00	\$ 3.50

Composted chicken manure	Average	High	Low
NE	\$ 45.00	\$ 50.00	\$ 40.00
Chesapeake	\$ 25.00	\$ 25.00	\$ 25.00
SE	\$ 42.00	\$ 42.00	\$ 42.00
Minneapolis	\$ 17.00	\$ 17.00	\$ 17.00
Texas	\$ 37.23	\$ 47.50	\$ 26.95
Denver	\$ 25.65	\$ 28.00	\$ 24.00
SF-Bay	\$ 16.00	\$ 16.00	\$ 16.00
SoCal	\$ 44.00	\$ 75.00	\$ 27.00

Composted cow manure	Average	High	Low
NE	\$ 45.50	\$ 46.00	\$ 45.00
SE	\$ 31.33	\$ 45.00	\$ 12.00
Cleveland	\$ 24.00	\$ 24.00	\$ 24.00
Iowa	\$ 42.00	\$ 60.00	\$ 16.00
Minneapolis	\$ 29.33	\$ 32.00	\$ 26.00
Texas	\$ 29.33	\$ 47.50	\$ 15.00
Denver	\$ 21.71	\$ 30.00	\$ 12.00
Phoenix	\$ 20.00	\$ 20.00	\$ 20.00
Northwest	\$ 23.85	\$ 33.75	\$ 17.45

SF-Bay	\$ 26.00	\$ 26.00	\$ 26.00
SoCal	\$ 17.25	\$ 24.00	\$ 12.00

Wood waste mulch	Average	High	Low
NE	\$ 21.35	\$ 38.00	\$ 12.50
Chesapeake	\$ 21.13	\$ 28.00	\$ 12.00
SE	\$ 18.78	\$ 34.95	\$ 12.00
Florida	\$ 17.50	\$ 18.00	\$ 17.00
Cleveland	\$ 25.56	\$ 36.25	\$ 14.00
Iowa	\$ 32.50	\$ 40.00	\$ 25.00
Minneapolis	\$ 26.00	\$ 35.00	\$ 20.00
Texas	\$ 16.19	\$ 27.00	\$ 9.00
Denver	\$ 18.74	\$ 25.00	\$ 12.48
Phoenix	\$ 17.61	\$ 22.95	\$ 10.00
Northwest	\$ 19.00	\$ 35.00	\$ 7.50
SF-Bay	\$ 18.14	\$ 30.00	\$ 8.00
SoCal	\$ 20.50	\$ 50.00	\$ 6.00

Colored wood mulch	Average	High	Low
NE	\$ 28.00	\$ 28.00	\$ 28.00
Chesapeake	\$ 28.67	\$ 33.00	\$ 25.00
SE	\$ 27.13	\$ 42.00	\$ 15.00
Florida	\$ 20.33	\$ 22.00	\$ 19.00
Cleveland	\$ 24.87	\$ 28.99	\$ 21.95
Iowa	\$ 30.00	\$ 30.00	\$ 30.00
Minneapolis	\$ 36.80	\$ 49.00	\$ 30.00
Texas	\$ 26.08	\$ 32.50	\$ 18.00
Denver	\$ 33.28	\$ 33.28	\$ 33.28
Northwest	\$ 35.00	\$ 35.00	\$ 35.00
SF-Bay	\$ 34.00	\$ 36.00	\$ 28.00
SoCal	\$ 32.50	\$ 35.00	\$ 30.00

## Bulk wholesale (yard)

Yard waste compost	Average	High	Low
NE	\$ 21.50	\$ 48.00	\$ 11.00
Chesapeake	\$ 13.39	\$ 16.00	\$ 8.00
SE	\$ 16.66	\$ 25.00	\$ 8.65
Florida	\$ 9.75	\$ 13.00	\$ 8.00
Cleveland	\$ 12.50	\$ 15.00	\$ 10.00
Iowa	\$ 14.00	\$ 19.00	\$ 8.00
Minneapolis	\$ 12.00	\$ 17.00	\$ 7.00
Texas	\$ 17.25	\$ 24.00	\$ 9.00
Denver	\$ 13.05	\$ 14.10	\$ 12.00
Northwest	\$ 14.79	\$ 35.00	\$ 7.50
SF-Bay	\$ 13.71	\$ 22.00	\$ 7.00
SoCal	\$ 7.33	\$ 10.00	\$ 6.00

Food waste compost	Average	High	Low
NE	\$ 25.79	\$ 48.00	\$ 11.00
Chesapeake	\$ 10.50	\$ 15.00	\$ 8.00
SE	\$ 20.65	\$ 30.00	\$ 15.00
Florida	\$ 10.50	\$ 13.00	\$ 8.00
Iowa	\$ 13.40	\$ 20.00	\$ 10.00
Minneapolis	\$ 12.00	\$ 12.00	\$ 12.00
Texas	\$ 17.50	\$ 24.00	\$ 8.50
Denver	\$ 11.33	\$ 15.00	\$ 7.00
Northwest	\$ 17.25	\$ 20.00	\$ 15.00
SF-Bay	\$ 12.67	\$ 26.00	\$ 5.00

Composted biosolids	Average	High	Low
NE	\$ 15.33	\$ 20.00	\$ 10.00
Chesapeake	\$ 9.31	\$ 15.00	\$ 5.00
SE	\$ 10.93	\$ 15.00	\$ 5.00
Florida	\$ 10.50	\$ 13.00	\$ 8.00
Texas	\$ 15.99	\$ 20.00	\$ 9.00

Denver	\$ 13.00	\$ 13.00	\$ 13.00
Northwest	\$ 16.75	\$ 21.00	\$ 12.00
SoCal	\$ 10.50	\$ 17.00	\$ 3.00

Composted cow manure	Average	High	Low
NE	\$ 36.00	\$ 36.00	\$ 36.00
SE	\$ 21.38	\$ 31.50	\$ 7.00
Iowa	\$ 35.00	\$ 35.00	\$ 35.00
Texas	\$ 25.00	\$ 25.00	\$ 25.00
Denver	\$ 12.05	\$ 14.10	\$ 10.00
Northwest	\$ 22.00	\$ 22.00	\$ 22.00
SF-Bay	\$ 34.25	\$ 34.50	\$ 34.00
SoCal	\$ 5.00	\$ 6.00	\$ 4.00

Wood waste mulch	Average	High	Low
NE	\$ 15.75	\$ 33.00	\$ 8.00
Chesapeake	\$ 15.80	\$ 17.00	\$ 13.00
SE	\$ 14.60	\$ 24.95	\$ 5.00
Florida	\$ 14.00	\$ 15.00	\$ 13.00
Iowa	\$ 30.00	\$ 40.00	\$ 20.00
Minneapolis	\$ 18.50	\$ 20.00	\$ 17.00
Texas	\$ 10.83	\$ 14.00	\$ 8.00
Denver	\$ 7.66	\$ 8.32	\$ 7.00
Northwest	\$ 15.00	\$ 15.00	\$ 15.00
SF-Bay	\$ 12.33	\$ 14.00	\$ 9.00
SoCal	\$ 9.25	\$ 15.00	\$ 5.00

Colored wood mulch	Average	High	Low
NE	\$ 22.00	\$ 22.00	\$ 22.00
Chesapeake	\$ 20.50	\$ 22.00	\$ 19.00
SE	\$ 19.00	\$ 25.00	\$ 15.00
Florida	\$ 16.00	\$ 16.00	\$ 16.00
Iowa	\$ 25.00	\$ 25.00	\$ 25.00
Minneapolis	\$ 27.00	\$ 35.00	\$ 19.00
Texas	\$ 20.67	\$ 24.00	\$ 18.00
Denver	\$ 17.66	\$ 21.32	\$ 14.00
Northwest	\$ 22.00	\$ 22.00	\$ 22.00
SF-Bay	\$ 21.00	\$ 22.00	\$ 19.00
SoCal	\$ 22.50	\$ 25.00	\$ 20.00

## Bag Retail

Compost (40# bag)	Average	High	Low
NE	\$ 6.87	\$ 8.00	\$ 4.50
Chesapeake	\$ 3.73	\$ 5.49	\$ 2.15
SE	\$ 4.00	\$ 4.00	\$ 4.00
Iowa	\$ 1.99	\$ 1.99	\$ 1.99
Cleveland	\$ 2.45	\$ 2.99	\$ 2.10
Iowa	\$ 3.12	\$ 7.99	\$ 1.50
Texas	\$ 4.25	\$ 6.99	\$ 1.99
Denver	\$ 3.59	\$ 4.75	\$ 1.73
Phoenix	\$ 4.71	\$ 5.99	\$ 2.77
Northwest	\$ 4.29	\$ 5.99	\$ 2.99
SoCal	\$ 5.39	\$ 6.25	\$ 3.90

Composted cow manure(40#bag)	Average	High	Low
NE	\$ 6.53	\$ 9.87	\$ 3.85
Chesapeake	\$ 5.97	\$ 7.95	\$ 3.99
SE	\$ 5.16	\$ 6.97	\$ 3.34
Florida	\$ 1.98	\$ 1.99	\$ 1.97
Cleveland	\$ 3.27	\$ 3.99	\$ 2.49
Iowa	\$ 2.18	\$ 2.49	\$ 1.75
Minneapolis	\$ 3.70	\$ 7.00	\$ 1.99
Texas	\$ 4.59	\$ 6.99	\$ 1.99
Phoenix	\$ 2.99	\$ 3.99	\$ 2.49
Northwest	\$ 3.99	\$ 3.99	\$ 3.99
SF-Bay	\$ 7.00	\$ 7.00	\$ 7.00

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## Farming

### Safety

From page 5

introducing food borne pathogens and promoting their survival in soils, many produce farmers have stopped applying both raw manures and animal-based composts in their farming operations, researchers said. For example, in a surveillance study, fewer than a quarter of 306 California fruit and nut producers reported using fully composted soil amendments and less than 10 percent used non-composted soil manure.

Researchers noted the known benefits of compost as a soil amendments, including increased soil nutrient concentrations, nutrient holding capacity, increased soil organic matter and enhanced microbial biomass, activity and diversity.

“While the direct risks associated with introducing pathogens into the farm environment are well understood, the

impacts of animal-based composts and other soil amendments on food borne pathogen survival in soils are less clear,” researchers said. “Long-term agricultural experiments offer unique opportunities to trace the effects of farm management on soil properties, microbial communities and food borne pathogen suppression.”

In their work, researchers measured, in laboratory microcosms, how composted poultry litter and/or cover crops affect the ability of agricultural soils to suppress food borne pathogens. The study was organized around three questions”

- How does long-term soil management with cover cropping and compost applications affect soil physicochemical properties and bacterial communities?
- Do soil physicochemical properties and bacterial communities influence the ability of *Salmonella* and *Listeria* to persist?
- How does long-term soil

management, namely compost additions and cover cropping, affect food borne pathogen survival in soils?

The experiment focused on 12 fields managed under a corn–tomato rotation.

Four soil management treatments were compared:

- Composted poultry litter and winter cover crops but no synthetic fertilizers;
- Conventional fields managed with synthetic fertilizers but no compost or cover crops;
- Cover-crop only fields, mixed fields managed with cover crops and fertilizers but no composts, and;
- Compost only fields - mixed fields managed with composts and fertilizers but no cover crops.

On fields receiving composts, composted poultry litter was broadcast across the field and incorporated into the soil during the fall at an average rate of four tons per hectare.

“We found that soil management

(See Safety, page 13)



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Twitter: [rotochopper](https://twitter.com/rotochopper)  
Facebook: [Rotochopper](https://www.facebook.com/Rotochopper)  
Contact: Nicole Klein  
[info@rotochopper.com](mailto:info@rotochopper.com)

## Screening Systems & Trommels



### Action Equipment Company Inc.

[www.actionconveyors.com](http://www.actionconveyors.com)  
2800 Hayes Street  
Newberg, OR 97132  
Phone: 503-537-1111  
Fax: 503-537-1117  
YouTube: [Action Conveyors](https://www.youtube.com/user/ActionConveyors)  
Action Conveyors  
LinkedIn: [Action-Equipment-Company-Inc.](https://www.linkedin.com/company/Action-Equipment-Company-Inc)  
Contact: Andrew LaVeine  
[sales@actionconveyors.com](mailto:sales@actionconveyors.com)



### Bandit Industries, Inc.

[www.banditchippers.com](http://www.banditchippers.com)  
6750 Millbrook Road  
Remus, MI 49340  
Ph: 989.561.2270,  
800.952.0178  
Fax: 989.561.2273  
YouTube: [banditchippers](https://www.youtube.com/user/banditchippers)  
Twitter: [banditchippers](https://twitter.com/banditchippers)  
Facebook: [banditiindustries](https://www.facebook.com/banditiindustries)  
Contact: [sales@banditchippers.com](mailto:sales@banditchippers.com)  
Regional Sales Mgr.

# Product/Equipment and Services Guide

## Screening Systems & Trommels (cont.)



### GrinderCrusherScreen Inc.

www.grindercrusherscreen.com  
1772 Corn Road  
Smyrna, GA 30080  
Phone: 770.433.2440  
Fax: 770.433.2669  
YouTube:  
GrinderCrusherScreen  
Twitter: GCS\_Equipment  
Facebook:GrinderCrusherScreen  
Contact: Rick Cohen  
rick@grindercrusherscreen.com



### Screen USA Inc.

www.screenusa.net  
1772 Corn Road  
Smyrna, GA 30080  
Phone: 770.433.2670  
Fax: 770.433.2669  
Contact: Rick Cohen  
rick@screenusa.net



### West Salem Machinery

www.westsalem.com  
P.O. Box 5288  
665 Murlark Ave. NW  
Salem, OR 97304  
Phone: 800.722.3530  
Phone: 503.364.2213  
Fax: 503.364.1398  
YouTube:  
West Salem Machinery  
Facebook:  
West Salem Machinery  
Twitter:  
West Salem Machinery  
Contact: Patrick Lorenz  
info@westsalem.com

## Shredders



### GrinderCrusherScreen Inc.

www.grindercrusherscreen.com  
1772 Corn Road  
Smyrna, GA 30080  
Phone: 770.433.2440  
Fax: 770.433.2669  
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West Salem Machinery  
Twitter:  
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Contact: Patrick Lorenz  
info@westsalem.com

## Thermometers & Monitoring Equipment



### Reotemp Instruments

https://reotempcompost.com  
10656 Roselle Street  
San Diego, CA 92121  
Phone: 858.225.1889  
Fax: 858.784.0720  
YouTube: reotemp compost  
Twitter:  
reotempcompost  
Facebook: reotemp  
Contact: Nathan O'Connor  
compost@reotemp.com

## Replacement Parts



### Agrisolutions Corp.

Trinity Hardware  
Extended Life Solutions  
www.agrisolutionscorp.com  
2984 AAA Court  
Bettendorf, IA 52722  
Phone: 563-459-6341  
Contact: Dan Zehnder  
dzehnder@agrisolutionscorp.com



### ARMORHOG CW Mill Equipment -

www.armorhog.com  
14 Commerce Drive  
Sabetha, KS 66534  
Phone: 800.743.3491  
Phone: 785.284.3454  
Fax: 785.284.2010  
YouTube:  
CWMillHogZilla  
Facebook:HogZilla Monster Grinders  
Contact: Brian Bergman  
sales@armorhog.com



### DynaHog CW Mill Equipment -

www.dynahog.com  
14 Commerce Drive  
Sabetha, KS 66534  
Phone: 800-743-3491,  
Phone: 785-284-3454  
Fax: 785-284-2010  
Contact: Jason Haug  
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Twitter: GCS\_Equipment  
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Contact: Rick Cohen  
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# Product/Equipment and Services Guide



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Phone: 800.743.3491  
Phone: 785.284.3454  
Fax: 785.284.3601  
YouTube:  
CWMillHogZilla  
Facebook:  
HogZillaMonsterGrinders  
Contact:  
Tim Wenger, VP, Sales Mgr.  
hogzilla@cwmill.com

## Windrow Turners



## Aeromaster Midwest Bio- Systems

www.aeromasterequipment.com  
www.midwestbiosystems.com  
28933 35 E Street  
Tampico, IL 61283  
Phone: 800.689.0714  
Fax: 815.438.7028  
YouTube:  
midwestbiosystems  
Twitter: compostingil  
Facebook:  
Contact: Cary Richardson  
info@midwestbiosystems.com



## Brown Bear Corp.

www.brownbearcorp.com  
PO Box 29,  
2248 Avenue of Industry  
Corning, IA 50841  
Phone: 641.322.4220  
Fax: 641.322.3527  
YouTube: Brown Bear Corp  
Contact: Stan Brown  
sales@brownbearcorp.com



## SCARAB International LLP

www.scarabmfg.com  
1475 County Road W  
White Deer, TX 79097  
Phone: 806.883.7621  
Fax: 806.883.6804  
YouTube: Scarab  
Manufacturing  
Twitter: Scarabmfg  
Facebook: Scarab  
International, LLLP  
Contact: Richard Miller  
info@scarabmfg.com

## Wood Grinders - Horizontal



## Bandit Industries, Inc.

www.banditchippers.com  
6750 Millbrook Road  
Remus, MI 49340  
Ph: 989.561.2270,  
800.952.0178  
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YouTube: banditchippers  
Twitter: banditchippers  
Facebook:  
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Contact:  
Regional Sales Mgr.  
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## Diamond Z

www.diamondz.com  
11299 Bass Lane  
Caldwell, ID 83605  
Phone: 208.585.2929  
Fax: 208.585.2112  
YouTube: Diamond Z  
Contact: Tristan Kruger  
tkruger@DiamondZ.com



## DuraTech Industries

www.duratechindustries.net  
Box 1940  
Jamestown, ND 58401  
Phone: 701.252.4601  
Fax: 701.252.0502  
YouTube:  
Duratechindustries  
Contact: Bob Strahm  
ind.sales@duratechindustries.net



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## Hogzilla Grinders CW Mill Equipment -

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Sabetha, KS 66534  
Phone: 800.743.3491 or  
785.284.3454  
Fax: 785.284.3601  
YouTube:  
CWMillHogZilla  
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Contact: Tim Wenger,  
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## Morbark, LLC

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Territory Sales Manager  
inquire@morbark.com

# Product/Equipment and Services Guide



**Featuring the industry's leading vendors.** This listing of the industry's leading vendors of products, equipment and services essential to the compost manufacturing, wood recycling and organics management business also is available online at [compostingnews.com](http://compostingnews.com). Scan the QR code with your mobile device to go there. If your business is not listed, please contact [ken@compostingnews.com](mailto:ken@compostingnews.com).

## Wood Grinders - Tub



### DuraTech Industries

[www.duratechindustries.net](http://www.duratechindustries.net)  
Box 1940  
Jamestown, ND 58401  
Phone: 701.252.4601  
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Contact:  
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## Wear Parts



### Agrisolutions Corp.

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2984 AAA Court  
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## Industry information

### Composting News

[www.compostingnews.com](http://www.compostingnews.com)  
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Composting News offers coverage of industry news and trends via a monthly print publication and real-time news online.  
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### The Paper Stock Report

[www.paperstockreport.com](http://www.paperstockreport.com)  
Contact: Ken McEntee  
[ken@paperstockreport.com](mailto:ken@paperstockreport.com)  
The Paper Stock Report offers coverage of paper recycling prices, markets and trends.  
Inquire about subscription prices.

**If your business is not listed in this directory, please contact [ken@compostingnews](mailto:ken@compostingnews)**



## Farming

### Safety

From page 8

altered soil chemical properties, with cascading implications for bacterial communities and food borne pathogen survival,” the report said. “Organic soils - soils with composts and cover crops but no fertilizers - had higher levels of soil macronutrients, organic matter and initial moisture content, and reduced soil pH. Effects of soil management on micronutrients were more complex. At the beginning of the growing season, soils in the compost-only treatment - soils with composts and fertilizers, but no cover crops - had the most micronutrients.

However, micronutrients declined over time in the compost-only and conventional treatments. As a result, conventional soils had fewer micronutrients than the other treatments by harvest.”

Researchers said the results demonstrate that long-term soil management alters soil chemical properties, with cascading implications for bacterial communities and food borne pathogen survival.

“Specifically, we found that the introduction of cover crops and composts as soil amendments increased soil macronutrients, organic matter and soil moisture, in turn causing marked shifts in bacterial communities,” the report said. “Perhaps because soils’ abilities to suppress pathogens are correlated with their biotic and abiotic properties, *Listeria* and *Salmonella* concentrations declined more rapidly in soils that were amended with composts.”

However, researchers said, before suggesting that soil amendments could be used as a strategy to improve food safety, at least four important caveats

must be noted:

- The study suggested strong temporal dynamics, with treatment effects dissipating over the growing season. While making soils more pathogen suppressive at any time could improve food safety, developing practices that continue to function through harvest would be ideal.

- The study was conducted in laboratory conditions with soil from experimental farms. A key next step would be to inoculate soils with pathogens in the field to assess survival in ambient conditions.

- Researchers used a 27-year soil manipulation experiment to assess cover crop and compost impacts on pathogen survival. Shorter experiments are necessary to determine how long it would take for farmers to make their soils more pathogen suppressive. Nonetheless, because *Salmonella* survival was indistinguishable between the 27-year organic treatment (compost and cover crops) and the more recent compost-only treatment, it is possible that shorter-term compost additions could also make soils more pathogen suppressive.

- Finally, prior studies have documented positive, negative and neutral effects of compost additions on pathogen persistence depending on the compost type, the pathogen, prior soil management history and other factors. Though less often studied, cover crop effects on food borne pathogens may also be context-dependent and warrant further studies to assess their short-term and long-term impacts on enteric pathogens.

Because animal-based composts may introduce food borne pathogens onto farms, many fresh-produce farmers feel tension between promoting soil health and food safety. Soil microbial communities may help reconcile this perceived trade-off.

The full report can be read at <https://sfamjournals.onlinelibrary.wiley.com/doi/full/10.1111/jam.15054>, or scan the code above with your mobile device.



## Food waste

### Maryland

From page 1

disposal system by:

- Reducing the amount of food residuals generated by the entity;
  - Donating servable food;
  - Managing the food residuals in an organics recycling system installed on site;
  - Providing for the collection and transportation of the food residuals for agricultural use, including for use as animal feed;
  - Providing for the collection and transportation of the food residuals for processing in an organics recycling facility - specifically a composting or anaerobic digestion facility; or
- Engaging in any combination of the above.

Affected entities are:

(See Maryland, page 14)



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## Food waste

### Maryland

From page 13

- Individual facilities owned or operated by a local school system;
- Individual public primary or secondary schools;
- Individual nonpublic schools;
- Supermarkets, convenience stores, mini-marts and similar establishments;
- Businesses, schools and institutional cafeterias.
- Cafeterias operated by or on behalf of the state or a local government.

The law doesn't apply to:

- The aggregate of all school buildings and facilities in a local school system; or
- Restaurants that accommodate the public and are equipped with a dining room with facilities for preparing and serving regular meals.

Food residuals refer to material derived from the processing or discarding of food, including pre- and post-consumer vegetables, fruits, grains, dairy products and meats.

Entities can apply for a waivers from the Maryland Department of Environment (MDE) if the cost of diverting food residuals from a refuse disposal system is more than 10 percent more expensive than the cost of disposing the food residuals at a refuse disposal system; or if the entity can show other hardships.

Penalties for non-compliance begin with a warning for the first violation, and include fines ranging from \$250 for the second offense to \$1,000 per day for the third and subsequent violations. Penalties are to be distributed to a special fund to be used to finance incentives that encourage food waste reduction and composting in the state.

"Over 25 percent of the overall food supply is inevitably wasted in retail businesses and at home," said Del. Lorig Charkoudian (D), sponsor of the legislation. "Composting turns this discarded organic material into a nutrient-rich product that helps sequester carbon while improving soil health and resiliency, and employing

Marylanders. This is an efficient use of waste that contributes to our climate goals."

Charkoudian said the legislation gives waste generators flexible options in order to achieve the goals set. For example, instead of sending food waste to organic recycling facilities, generators could implement their own methods of reducing waste, such as self-management onsite, agricultural usage or through donations.

"Composting has the added environmental benefit of improved soil quality," she said. "When added to soil, compost adds carbon and can reduce urban stormwater pollutants by 60 to 95 percent. Soil health has been in decline, in part due to our broken food system. We extract nutrients when we grow plants in soil, but do not return those nutrients to the soil. Adding compost to our soil strategy replenishes the soil microbiome and improves soil health."

Charkoudian noted that the positive impact of organic waste bans has been seen in other states. For example, she said, when similar legislation passed in Vermont, food donations increased by at least 30 percent, taking usable food and getting it into the hands of food banks and hungry people.

In 2014, Massachusetts made it illegal to dispose of a certain amount of generated commercial organic waste. By 2017, the state's environmental protection agency found the quantity of organic waste collected was nearly three times the baseline amount.

Dan Israel, vice president of sales and marketing for the Rockville, Md.-based Compost Crew, testified to the legislature in support of the legislation.

"Compost Crew has almost 10 years of experience collecting and composting food scraps," Israel said. "We currently serve thousands of households in the state of Maryland. A growing number of businesses use our services, including apartment buildings, restaurants, grocery stores and senior living communities. These businesses have signed up with us to help reduce their trash bills and because they recognize the importance of diverting their food

waste from landfills, where it would create methane, a potent greenhouse gas."

In 2020, he said, the company has diverted five million pounds of food and organic waste to area compost facilities.

The Maryland Compost Advocacy Coalition also supported the legislation.

"A version of this bill was introduced in the 2020 session, but this year's bill contains changes to address concerns raised by small businesses," the coalition said in a statement. "For instance, the bill no longer applies to entities that produce less than one ton of food waste per week and it also contains waiver protections for entities that cannot find a cost competitive diversion option. Large generators of food waste produce most of the organic waste in the state – facilities that generate more than one ton of food waste a week contribute more than half of Maryland's organic waste."

The Maryland Delaware Solid Waste Association (MDSWA), a chapter of the National Waste and Recycling Association (NWRA), opposed the bill.

"House Bill 264 is essentially a disposal ban for large generators of food waste despite the lack of adequate infrastructure for organics recycling to manage the volumes specified in the legislation," the association said in a statement. "While MDSWA is a strong proponent of organics recycling and appreciates the intent of the legislation, it must oppose its adoption as the requirements of the bill cannot realistically be implemented in the timeframes proposed in the bill or without significant costs to the state, local governments and the businesses and institutions to which the disposal ban would apply."

MDSWA said the barriers to effective implementation include a lack of permitted capacity and "one size fits all" requirements that do not recognize that collection, hauling, disposal and recycling infrastructure that must be inherently "local" to be effective and efficient.

"The cost of collection, population density, transportation costs, facility location and capacity, as well as a myriad

of other factors require local planning and implementation and should not be mandated statewide,” MDSWA said. “The goals of House Bill 264 are notable, but the infrastructure to implement does not exist.”

In addition, MDSWA said, there is virtually no data currently available to determine how many businesses and institutions may be affected by this legislation.

“Hospitals, colleges, nursing homes, food distribution facilities, grocery stores, state office complexes and correctional facilities all potentially will be forced to redesign their management of waste without any assurance there will be facilities available to meet their demand or the cost implications of the redesign,” MDSWA said.

Gov. Larry Hogan took no action on the passed legislation within six days of passing the legislature, allowing it to become law.

## East Coast grocer stops landfilling food waste

**M**aine-based Hannaford Supermarkets said it is the first grocer in New England and New York to divert food waste from all of its stores from landfills. Hannaford said all of food waste from its 183 stores is instead being donated to the hungry, to local farmers for animal feed and to food-to-energy conversion projects.

The supermarket chain diverted 32,500 tons of food waste from landfills in 2020.

Hannaford said it achieved food waste reduction with a multi-pronged approach that focused on first preventing food waste through strategic product ordering and management at the store level. Hannaford associates are trained on how to responsibly handle food to avoid damage and exposure to temperature variation.

While food recovery and donation are long-established operational practices at

Hannaford, the retailer fully realized



the achievement of zero food waste by partnering with Agri-Cycle, a food waste recycling company based in Scarborough, Maine, to turn food unsuitable for human and animal consumption into energy.

Agri-Cycle regularly services Hannaford stores to pick up inedible food, which its anaerobic digesters transform into electricity that is sold back onto the grid. The anaerobic digester is located at Agri-Cycle’s sister company - the five-generation family owned-and-operated Stonyvale Farms in Exeter, Maine. In addition to energy, a byproduct of the process produces liquid fertilizer as well as bedding for the farm’s dairy cows, resulting in a virtuous cycle.

Agri-Cycle’s operation includes a state-of-the-art de-packaging machine that separates expired or damaged packaged food from its container—allowing for easy recycling of food waste that would otherwise end up in a landfill due to its packaging.

“Hannaford is a true sustainability champion with a deep understanding of the challenges regarding food waste recycling. Solutions are never one-process fits all,” said Dan Bell, president and co-founder of Agri-Cycle. “By taking a multifaceted approach, Hannaford ensures they are navigating the food waste hierarchy with intent, maximizing the value of their unsold food by helping to create renewable energy while protecting the environment.”

The partnership with Hannaford has enabled Agri-Cycle to expand its area of operation and make the process more accessible to other companies and organizations in the Northeast.

“Hannaford’s role as a frontrunner in achieving this milestone has allowed Agri-Cycle to gain efficiency of scale and provide food waste recycling services to

many other businesses in towns and cities across New England,” said Bell. “Hannaford has had a significant impact not only at their stores, but on hundreds of other food waste producers throughout the region.”

Hannaford said each of its stores strictly follow the U.S. EPA Food Recovery Hierarchy, which prioritizes the rescue of surplus product for donation to food insecure individuals – generating millions of meals donated annually. Other key elements of Hannaford’s food waste diversion program include donations to local farmers for animal feed and food-to-energy conversion efforts.

“The health and well-being of our planet are a top priority for all of us at Hannaford and we recognize that our role in the food supply chain comes with great responsibility,” said Mike Vail, president of Hannaford Supermarkets. “The impact food waste has on our environment cannot be overstated. When we first established this goal, it was with the greater purpose of making a real and positive impact on our communities. Eliminating hunger and food waste are essential to improving the world we live in.”

As a Feeding America partner, Hannaford said it donates as much safe and nutritious food as possible to a network of community pantries, soup kitchens and food banks. According to the Food and Agriculture Organization of the United Nations, up to 40 percent of all food, or enough to feed three billion people, is never consumed. Hannaford stores donated more than 25 million pounds of food, such as beef and chicken; fruit and vegetables; pasta and eggs, for local hunger relief organizations in 2020.

Among the thousands of hunger relief organizations benefitting from Hannaford’s food recovery efforts is Good Shepherd Food Bank of Maine, which receives regular deliveries from Hannaford.

“Hannaford has been the largest food donor to the food bank going back to our founding 40 years ago,” said Erin Fogg,

*(See Grocer, page 16)*

## Food waste

### Grocer

From page 15

vice president of development and communications for Good Shepherd. “Over the decades Hannaford has innovated and found new ways to support our food distribution with both shelf-stable and fresh, nutritious food and produce. Food from Hannaford stores is distributed through the Food Bank’s partner network of over 500 hunger-relief organizations, helping thousands of Mainers who are experiencing hunger.”

Hannaford stores donate food not suitable for human consumption to local livestock farmers, who use the items as feed for cows, sheep, pigs and other animals.

“I feed 90 percent of my pigs from what I get from Hannaford,” said John Rowland, farmer at Bad Flash Brewing Farm, in Malden Bridge, N.Y. “That’s a huge benefit to me, plus it doesn’t show up in the landfill.”

U.S. Congresswoman Chellie Pingree, of Maine, cofounder of the bipartisan Congressional Food Recovery Caucus, said food waste is one of the most pressing challenges of our time.

“At the federal level, I have made food waste prevention a central tenet of my climate work,” Pingree said. “I plan to reintroduce several bills this Congress to help prevent food waste from ending up in landfills. As Hannaford has shown, there are so many opportunities to recover food. I applaud Hannaford for setting the goal within each of its 183 stores to donate or divert all food waste and sending no food at all to landfills.”

## Compostable

### Plastic

From page 1

compared to 60 to 90 days it can take to turn plant and food waste into usable compost. This advance will potentially solve waste management challenges at forward operating bases and offer additional technological advances for



A film of PLA plastic immediately after being placed in compost (left) and after one week in the compost (right). Photo: UC Berkeley / Berkeley Engineering / Adam Lau.

American soldiers, the Army said.

“People are now prepared to move into biological polymers for single use plastics, but if it turns out that it creates more problems than it’s worth, then the policy might revert back,” said Ting Xu, UC Berkeley professor of materials science and engineering and of chemistry. “We are basically saying that we are on the right track. We can solve this continuing problem of single use plastics not being biodegradable.”

The new process, developed by researchers at Berkeley and the University of Massachusetts Amherst, involves embedding polyester-eating enzymes in the plastic as it’s made.

When exposed to heat and water, an enzyme shrugs off its polymer shroud and starts chomping the plastic polymer into its building blocks. In the case of biodegradable plastics, which are made primarily of the polyester known as polylactic acid, or PLA, it reduces it to lactic acid that can feed the soil microbes in compost. The polymer wrapping also degrades.

The process, published this month in *Nature*, eliminates microplastics, a byproduct of many chemical degradation processes and a pollutant in its own right. Up to 98 percent of the plastic made using this technique degrades into small molecules, the Army said.

The process creates a fast degradation that works well in municipal composting operations, UC Berkeley said.

“These results provide a foundation for the rational design of polymeric

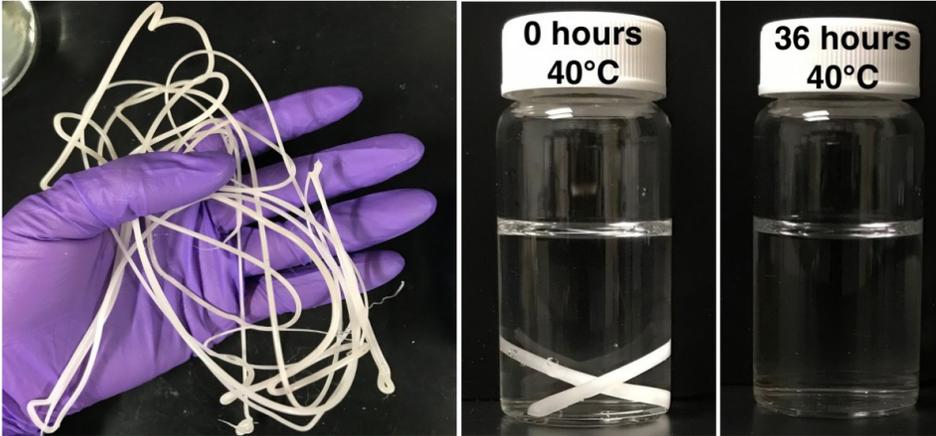
materials that could degrade over relatively short time scales, which could provide significant advantages for Army logistics related to waste management,” said Dr. Stephanie McElhinny, program manager, Army Research Office, an element of the U.S. Army Combat Capabilities Development Command, known as DEVCOM, Army Research Laboratory. “More broadly, these results provide insight into strategies for the incorporation of active biomolecules into solid-state materials, which could have implications for a variety of future Army capabilities including sensing, decontamination, and self-healing materials.”

Plastics are designed not to break down during normal use, but that also means they don’t break down after they’re discarded. Compostable plastics can take years to break down, often lasting as long as traditional plastics.

The research teams embedded nanoscale polymer-eating enzymes directly in a plastic or other material in a way that sequesters and protected them until the right conditions to unleash them. In 2018, they showed how this works in practice.

The team embedded in a fiber mat an enzyme that degrades toxic organophosphate chemicals, like those in insecticides and chemical warfare agents. When the mat was immersed in the chemical, the embedded enzyme broke down the organophosphate.

The researchers said protecting the enzyme from falling apart, which



(Photo: UC Berkeley / Christopher DelRe)

proteins typically do outside of their normal environment, such as a living cell, resulted in the key innovation.

For the *Nature* paper, the researchers showcased a similar technique by enshrouding the enzyme in molecules they designed called random heteropolymers (RHPs), and embedding billions of these nanoparticles throughout plastic resin beads that are the starting point for all plastic manufacturing.

The process is similar to embedding pigments in plastic to color them.

“This work, combined with the 2018 discovery, reveals these RHPs as highly effective enzyme stabilizers, enabling the retention of enzyme structure and activity in non-biological environments,” said Dr. Dawanne Poree, program manager, ARO. “This research really opens the door to a new class of biotic-abiotic hybrid materials with functions only currently found in living systems.”

The results showed that the RHP-shrouded enzymes did not change the character of the plastic, which could be melted and extruded into fibers like normal polyester plastic at temperatures around 170 degrees Celsius (338 degrees Fahrenheit).

Another polyester plastic, PCL (polycaprolactone), degraded in two days under industrial composting conditions at 40 degrees Celsius (104 degrees Fahrenheit).

For PLA, the team embedded an enzyme called proteinase K that chews PLA up into molecules of lactic acid; for

PCL, they used lipase. Both are inexpensive and readily available enzymes.

“If you have the enzyme only on the surface of the plastic, it would just etch down very slowly,” said Ting Xu, UC Berkeley professor of materials science and engineering and of chemistry. “You want it distributed nanoscopically everywhere so that, essentially, each of them just needs to eat away their polymer neighbors, and then the whole material disintegrates.”

Xu suspects that higher temperatures make the enshrouded enzyme move around more, allowing it to more quickly find the end of a polymer chain and chew it up and then move on to the next chain. The RHP-wrapped enzymes also tend to bind near the ends of polymer chains, keeping the enzymes near their targets.

The modified polyesters do not degrade at lower temperatures or during brief periods of dampness.

For instance, a polyester shirt made with this process would withstand sweat and washing at moderate temperatures.

Soaking the biodegradable plastic in water for three months at room temperature did not cause it to degrade, but soaking for that time period in lukewarm water did.

Xu is developing RHP-wrapped enzymes that can degrade other types of polyester plastic, but she also is modifying the RHPs so that the degradation can be programmed to stop at a specified point and not completely destroy the material. This might be useful

if the plastic were to be re-melted and turned into new plastic.

“Imagine, using biodegradable glue to assemble computer circuits or even entire phones or electronics, then, when you’re done with them, dissolving the glue so that the devices fall apart and all the pieces can be reused,” Xu said.

This technology could be very useful for generating new materials in forward operating environments, Poree said.

“Think of having a damaged equipment or vehicle parts that can be degraded and then re-made in the field, or even repurposed for a totally different use,” Poree said. “It also has potential impacts for expeditionary manufacturing.”

In addition to the Army, the U.S. Department of Energy with assistance from the UC Berkeley’s Bakar Fellowship program also funded the research.

## The best compostable trash bags, perhaps

**N**ew York Magazine’s “The Strategist” feature this month asked six eco-conscious consumers and people who compost for recommendations for biodegradable trash bags.

Recommended products were:

- BioBag three gallon compostable bags.
- BioBag 13 gallon kitchen bags
- Green Paper Products 13 gallon biodegradable heavier duty trash bags
- Aircover 8 to 12 gallon biodegradable trash bags
- Stout by Envision EcoSafe-6400 compostable bags
- Paper grocery bags with handles
- Boba & Vespa Planet Digestible dog poop bags
- Doggy Do Good biodegradable dog and cat poop bags

Biodegradable trash bags, the article points out, have the same environmental

(See *Bags*, page 18)

## Compostable

### Bags

From page 17

impact as single-use plastic bags from grocery stores and carryout restaurants.

“Switching to biodegradable or compostable trash bags is a relatively simple swap that can minimize waste and demand for plastic products, overall,” it says. “These biodegradable bags — made of plant-based or recyclable materials — are often used as liners for compost bins, but they work just as well for regular, non-compostable trash, too.”

The article suggests making sure that compostable trash bags have been certified by the Biodegradable Products Institute (BPI).

“That means they’ve gone through a rigorous testing process to ensure that they can actually biodegrade, and they are easily identifiable by the BPI logo on the packaging,” the article says. “But the BPI certification doesn’t guarantee that your trash bag won’t rip open when you try to take it out or leak all over your garbage can, so we asked six composters and eco-conscious consumers to share the trash bags that they use in their kitchens, compost bins, and even to pick up after their dogs — all of which are BPI certified.”

BioBags were recommended as a “nice option” that doesn’t “tear or break open.”

Green Paper Products bags are an option if you worried about leaks or rips, but want a fully compostable bag.

Aircover bags are “sturdy and durable,” but still “decompose into carbon dioxide and water via microorganisms in the soil.” And unlike other options on this list, they come with drawstrings for easy tying.

The EcoSafe-6400 bags were reported to take only 50 to 100 days to break down in compost.

Paper Grocery Bags with Handles aren’t as water-resistant as the ones above, but unwaxed paper bags are compostable, too, the article said. The biggest downside of paper is that it is not water-resistant — but since they’re also recyclable, they’re a great option for

lining your recycling can. For picking up dog waste, one composter likes the these package-free compostable bags made from maize flour and vegetable oil from Boba & Vespa.

Read the full article at [mymag.com/strategist/article/best-biodegradable-trash-bags.html](http://mymag.com/strategist/article/best-biodegradable-trash-bags.html) or scan the code above with your mobile device.



## Biosolids

### Washington state approves biosolids application

The Washington Department of Ecology has approved a proposal to land apply biosolids at five Lewis County sites. The agreement allows land application of Class B biosolids at sites owned by Fire Mountain Farms as early as this spring.

In order to begin land application to the remaining two locations, the company must meet additional requirements to complete cleanup at the two sites to deal with a mixed material that had been classified as hazardous waste before applying any biosolids.

The agreed order gives the company authorization for this specific work. This agreed order will end when Fire Mountain Farms obtains final approval under the next statewide general permit for biosolids management.

Washington law requires biosolids be put to a beneficial use, such as improving soil quality and growing crops like wheat, corn, grass, hay and hops. Biosolids can be applied as a liquid, dewatered so the material resembles soil or dried out completely. Ecology regulates wastewater treatment plants that produce biosolids and businesses that apply them.

Biosolids in Washington are divided into one of two classes, based on their treatment. Class A biosolids eliminate

all pathogens, including viruses. Class B biosolids may include pathogens, which is why restrictions are in place that allow time for remaining pathogens to degrade before humans or animals are allowed to come in contact with them.

While cleanup activities at Fire Mountain’s Big Hanaford location are complete, portions of the Newaukum Prairie and Burnt Ridge sites are still going through cleanup and closure activities related to the mixed material formerly classified as a hazardous waste being improperly stored at the locations.

Last year, the U.S. EPA determined that the mixed material could be delisted and disposed in an ordinary, municipal landfill. That cleanup work is nearly complete.

### Goldman Sachs fund completes Synagro acquisition

The sale of Synagro Technologies Inc., the largest recycler of organics by-products in North America, from EQT Infrastructure to West Street Infrastructure Partners III, an infrastructure investment fund managed by Goldman Sachs Merchant Banking Division, was recently completed.

Founded in 1986, Baltimore-based Synagro said it is the leading provider of wastewater biosolids solutions in North America, turning a waste stream into fertilizer products for more than 800 municipal and industrial customers across 35 states. Synagro manages more than 14 million tons of biosolids annually across its portfolio of 24 specialized treatment facilities and the industry’s largest permitted beneficial use land base. End products include compost and energy pellets. The company said under EQT’s ownership, it developed into the industry leading wastewater biosolids solutions platform in North America with the industry’s largest wastewater biosolids treatment facility footprint.

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