

# **Organics Reduction & Recycling**

**Moving Forward in NYS** 

Molly Trembley, P.E. | NYSDEC January 25, 2024 | Buffalo, NY

## NYSDEC Organics Reduction & Recycling Program

Regulate and promote the diversion of organics (wasted food, yard waste, biosolids, food processing waste, etc.) from disposal to beneficial uses.

- Regulatory Oversight & Technical Assistance
- Policy Implementation & Legislative Advocacy
- Funding Programs
- Outreach & Education

Broad group working on these issues!

Organics Reduction & Recycling Section – Central Office, Albany

Regional staff – Cover each of the 9 DEC Regions in all solid waste and recycling programs



## **Organics Recycling in NYS**

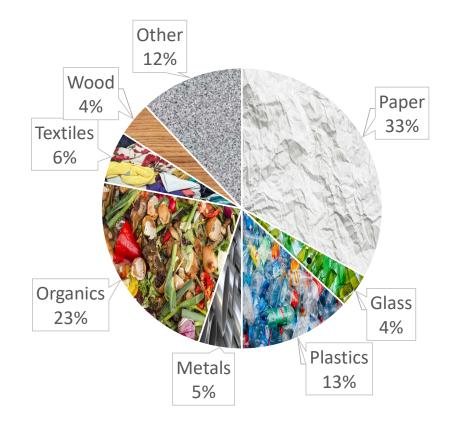
| Facility Type                                   | Statewi<br>de | Region 9<br>(6 Counties<br>in WNY) | Orillia Brockville Green Mountains  |
|---|---------------|------------------------------------|---|
| Anaerobic Digestors                             | 5             | 3                                  | 2 Lake Peterborough Kingston Park Montpelier  |
| Biosolids Composting                            | 30            | 6                                  | an Oshawa   |
| Yard Trimmings Composting                       | 116           | 16                                 | Toronto Lake Ontario  |
| SSO Composting (incl. food scraps)              | 59            | 9                                  | Iton St Catharines Rochester Synacuse Utica Green   |
| Mortality Composting                            | 10            | 2                                  | Niagara<br>Falls Buthlo NEW YORK Mohawe National Forest   |
| Mulch Processing                                | 47            | 10                                 | Massach   |
| Food Processing Waste Land App                  | 58            | 3                                  | Binghamon Superson Catsul   |
| Biosolids Land App                              | 19            | 2                                  | Allegheny AllEGHENY MOUNTAINS Pro   |
| Septage Land App                                | 63            | 14                                 | Forest PENNSYLVANIA Scranton CONNECTICUT<br>Bridgeport  |
| Storage   | 39            | 3                                  | State<br>College  |
| NEW! 3 <sup>rd</sup> Party CAFO Manure Land App | -             | -                                  | Allentown - Edison - |

# New York State Solid Waste Management Plan

**Published 12/27/23** 



## Managing NYS's Municipal Solid Waste Stream





NEW YORK STATE Conservation

New York State Solid Waste Management Plan BUILDING THE CIRCULAR ECONOMY THROUGH SUSTAINABLE MATERIALS MANAGEMENT

Kathy Hochul, Governor | Basil Seggos, Commissioner



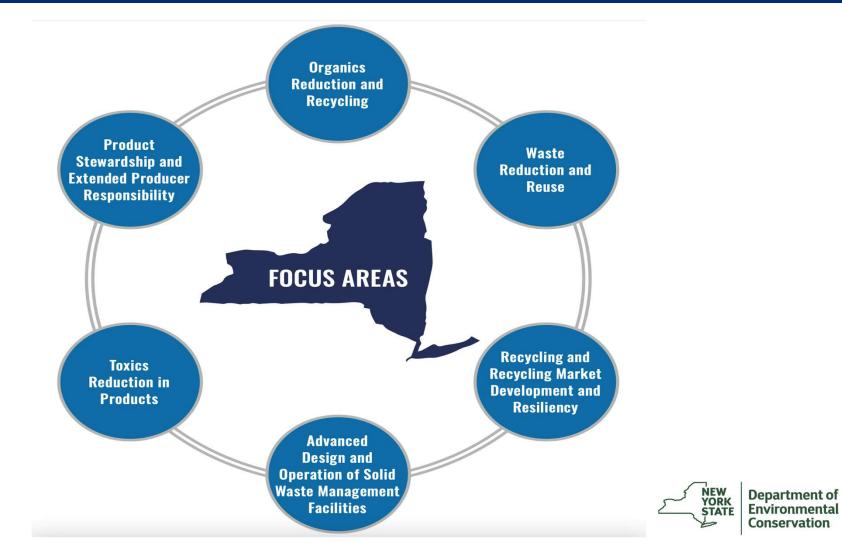
## Scope of Plan

- Background on current solid waste management in New York State;
- Issues, challenges, and opportunities including:
  - Climate
  - Throw-away culture
  - Global markets
  - Information sharing and technology
  - Equity issues
  - Ecosystem impacts
  - Emerging contaminants sampling and research
- Values and visions with regards to materials management in New York State and the guiding principles that will provide the direction and structure to get us there
- 6 Focus Areas and a detailed roadmap of the actions that must be taken to achieve the waste disposal reduction goals through 2050









## Vision

- Landfilling is reduced by 85% by 2050
- The circular economy is realized
- Collaboration and innovation are commonplace
- "Waste" is a concept of the past
- Climate change mitigation is fully implemented
- Shared responsibility is a given
- Equitable, inclusive, and accessible waste reduction and reuse efforts are widespread
- Responsible and resilient markets thrive





## **Action Items**

- 168 action items spread across 31 goals
- 33 action items require legislative action
- Action items are aligned with the recommendations in the CLCPA Final Scoping Plan



NEW YORK STATE Conservation

New York State Solid Waste Management Plan BUILDING THE CIRCULAR ECONOMY THROUGH SUSTAINABLE MATERIALS MANAGEMENT



Download the full final plan here:

https://dec.ny.gov/environmental-protection/waste-management/solid-waste-management-planning/nys

## **Transformative Legislative Action Needed**

- **Developing EPR for paper and packaging**, and framework legislation that allows the addition of other products
- Expand and amend the existing Food Donation & Food Scraps Recycling Law (include smaller businesses and institutions, eliminate the mileage limit to an organics recycling facility)
- Require a per ton disposal disincentive surcharge on all waste disposed in NYS and all waste generated in NYS being sent for disposal out-of-state to provide financial support for reduction, reuse and recycling projects



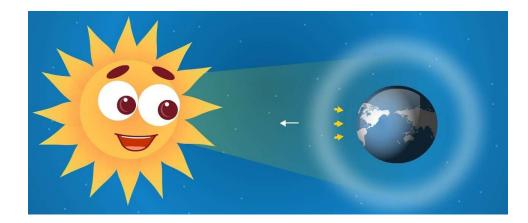
# Climate Leadership and Community Protection Act



## **Climate Leadership and Community Protection Act**

The CLCPA has 3 GHG reduction requirements.

- 1. 2030 statewide GHG emissions limit (40x30)
- 2. 2050 statewide GHG emissions limit (85x50)
- 3. 2050 net zero goal (100x50)





## How does this relate to waste?

- 1) The CLCPA "math" highlights sources of methane.
- 2) It will take time to see a change in solid waste emissions.
- 3) The CLCPA is a big opportunity for Recycling and especially **Organics Mgmt**

### **Current Estimated GHG Emissions by Sector**



## **Scoping Plan and Integration Analysis**

- Reflects Advisory Panels recommendations, Just Transition Working Group strategies, Climate Justice Working Group comments
- Models various scenarios and the Scoping Plan's forecasted impact on emissions reduction



# **Scoping Plan Strategies**

Focus on:

- Introducing/implementing legislation
- Enact regulations
- Provide financial support statewide Issues:
- Financial limitations
- Behavioral change
- Logistics (including low landfilling costs)
- Viable markets for resultant products/soil amendments





## **SWM Facility Permitting Impacts**

Commissioner Policy #49:

https://www.dec.ny.gov/regulations/56552.html

Specific program guidance issued for air permits: <a href="https://www.dec.ny.gov/docs/air\_pdf/dar21.pdf">https://www.dec.ny.gov/docs/air\_pdf/dar21.pdf</a>

Materials Management Facilities:

DEC currently assessing on a site-by-site basis; program specific guidance coming soon.

| DAR-21<br>The Climate Leadership and Community Protection Act and<br>Air Permit Applications |  |  |  |
|--|--|--|--|
| New York State Department of   | Environmental Conservation                 |  |  |
| DEC Program Policy   |  |  |  |
| Issuing Authority: Christopher M. LaLone, P.E.   | Title: Director, Division of Air Resources |  |  |
| Signature:   |  |  |  |
| Date Issued: 12/14/22  | Latest Date Revised:                       |  |  |
|  | Unit: Bureau of Stationary Sources         |  |  |

- Summary: This policy document, issued by the New York State Department of Environmental Conservation (DEC) Division of Air Resources, outlines the requirements for analyses developed pursuant to Section 7(2) of the Climate Leadership and Community Protection Act (CLCPA) in support of air pollution control permit applications.
- II. Policy: Consistent with CP-49, Climate Change and DEC Action, this policy is written to provide guidance for applicants and DEC staff when preparing and reviewing CLCPA analyses submitted to DEC in support of air pollution control permit applications.



### **The State Energy Plan**

will be updated to incorporate the recommendations of the Scoping Plan

#### Every five years,

the Climate Action Council will update the Scoping Plan as part of the ongoing process

#### 0

## DEC will have until January 1, 2024,

to draft & circulate enforceable regulations to ensure the State meets the Climate Act's statewide GHG emission limits

#### **Every four years**,

DEC will publish a report on the implementation of GHG reduction measures (consulting with the Climate Action Council and Climate Justice Working Group)



## **Food Waste in the Landfills**

Most significant greenhouse gas produced from waste is methane

Methane is released during the breakdown of organic matter in landfills

Organic matter includes food waste







## **CLCPA & Organics**



- Reduce disposal
- Food Law, eventual disposal ban
- Fee per ton on waste disposed
- Funding/resource opportunities
- Regulatory revisions
- Expand and replicate successful local collection programs
- Research
- Fugitive emissions monitoring and reduction
- Market development



# Sensing a trend?

Both the State Solid Waste Management Plan and the CLCPA require big moves in organics reduction and recycling...



# THE FOOD DONATION & FOOD SCRAPS RECYCLING LAW TOOK EFFECT JANUARY 1, 2022



## Food Donation & Food Scraps Recycling Law

Businesses that generate an annual average of two tons of wasted food per week or more must...

- 1. donate excess edible food to the maximum extent practicable; and
- 2. recycle all remaining food scraps if they are within 25 miles of an organics recycler (composting facility, anaerobic digester, etc.).

## Total DFSGs Required to Donate: 1,164 Total DFSGs Required to Recycle Food Scraps: 458

View list of businesses & institutions required to comply

#### **Exclusions:**

- Hospitals
- Nursing Homes
- Adult Care Facilities
- Elementary and secondary schools
- New York City (local law 146)
- Generators serviced by a mixed waste recycler (Delaware County)
- Farms



## **Adopted Part 350 Regulations**

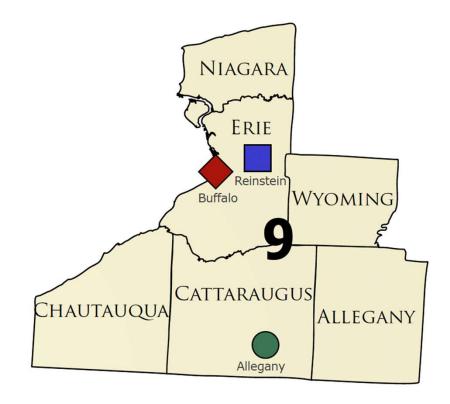
6 NYCRR Part 350 Regulations implement the requirements outlined in the Law for:

- Designated food scraps generators;
- Organics recyclers and transfer facilities;
- Transporters; and
- Solid waste management facilities (landfills and combustors).

## Food safety still regulated by NYSDOH & NYSDAM

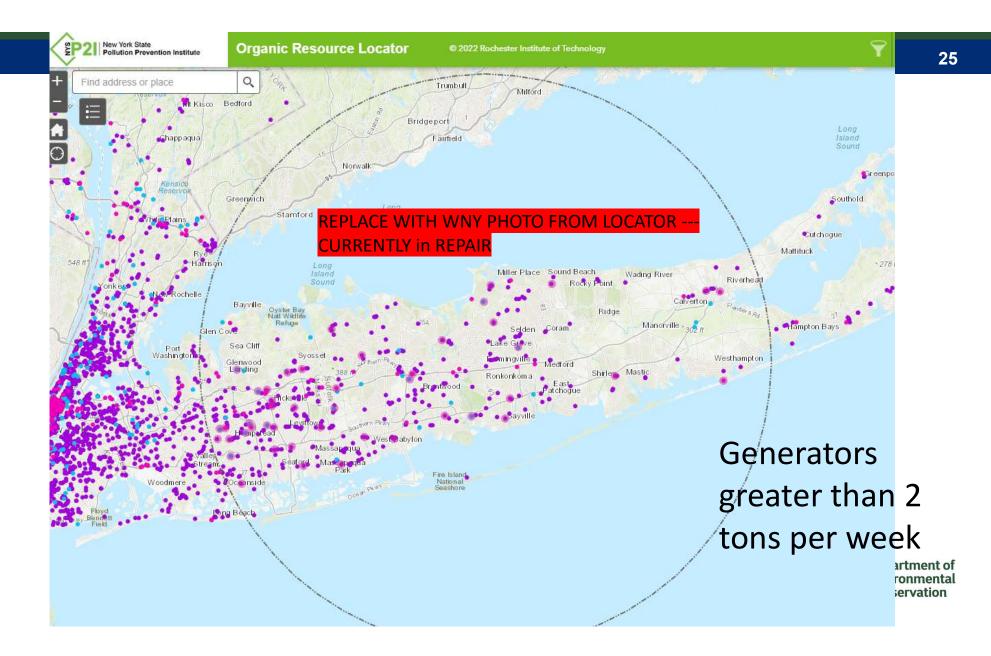


## **DEC Region 9**



## Large Food Scraps Generators 2024

| Sector             | Total | Must Donate | Must Recycle |
|--------------------|-------|-------------|--------------|
| Colleges           | 9     | 9           | 6            |
| Jails              | 4     | 4           | 3            |
| Grocery            | 39    | 39          | 32           |
| Hospitality        | 13    | 13          | 13           |
| Restaurants        | 44    | 44          | 38           |
| Supercenters       | 10    | 10          | 9            |
| Amusement Parks    | 0     | 0           | 0            |
| Casinos/Racetracks | 1     | 1           | 0            |
| Malls              | 4     | 4           | 0            |
| Sporting Venues    | 2     | 2           | 0            |
| Wholesale          | 9     | 9           | 0            |



# **First Year of Implementation**

- Donation has been a great success!
- Food scraps recycling will take time to grow
- Spot inspections are happening across State (performed by DEC)
- Working with businesses to ensure they understand the law and their requirements under the law

View the full report here:

https://extapps.dec.ny.gov/docs/materials\_mine rals\_pdf/2022foodannualreport.pdf



NEW YORK STATE Conservation

New York State Food Donation and Food Scraps Recycling Law REPORT TO THE GOVERNOR AND LEGISLATURE-2022 Food Tossed Is an Opportunity Lost

Kathy Hochul, Governor I Basil Seggos, Commissioner





#### Food Donation and Food Scraps Recycling Law Guidance for New York State Businesses



## Guidance for New York State Businesses

- Food Waste Reduction
  - · Quantifying your food waste
  - · Determining the root causes of your food waste
- Food Donation
  - Liability protection
  - Donating prepared foods
  - Proper cooling procedures
  - Best practices for labeling, storing and transporting
- Food Scraps Recycling
  - Separating and storing food scraps
  - Training staff
  - Transporting food scraps for recycling

View Business Guidance Handbook



## DFSG Annual Reporting

- Required to submit <u>annual</u> <u>report</u> to DEC – amount donated and recycled, transporter and recycler used, etc.
- Due March 1, 2023 and annually thereafter
- Governor and Legislature Report

#### SECTION 3 - FOOD DONATION PRACTICES FOR 2022

Provide the following information on your food donation practices for the reporting period beginning January 1, 2022 and ending December 31, 2022.

Total Food Donated in 2022: Ibs

List the organizations that received donations of food:

| • |  |  |  |
|---|--|--|--|
| • |  |  |  |
| • |  |  |  |
|   |  |  |  |
|   |  |  |  |

Type of food donated, check all that apply below

| Pre-packaged, shelf-stable foods: e.g., canned, boxed, or packaged foods  |
|---|
| Baked goods   |
| Fresh produce (whole)   |
| Dairy products  |
| Prepared foods (food that has been prepared but was never served): e.g., entrees or other prepared meals, starches, prepared produce (e.g., cut/chopped fruit or vegetable), side dishes, chilled perishable prepackaged food (e.g., chilled fruit juice), etc. |
| Meat, eggs, poultry, seafood (fresh or frozen)  |
| Frozen foods (not including meat, poultry or seafood): e.g., entrees, fruits, fruit juice, vegetables, baked goods, etc.  |



## Donation Technical Assistance

## FeedingNYS Call Center

- Setting up a donation program
- Finding a food bank or local food rescue organization to partner with
- Understanding food safety practices when donating

Onboarding new businesses required to donate

Working with businesses who are already donating to expand what they are donating

**Over 5 million pounds donated** 

# Rethink Food Waste NY

- Contracted with Center for EcoTechnology
- **Free** technical assistance to New York State businesses, and institutions
- *Free* technical assistance to organics recyclers -- composting consultants on hand

## For more information

## No-Cost Waste Assistance for NY Businesses

Sign up to have a CET expert provide on-thespot, no-cost waste assessments and identify opportunities for improved recycling, solutions to surplus food and loss, and other resources.

wastedfood.cetonline.org/ states/new-york Food Recovery & Composting

> Cost Savings

Sustainability Tools

CENTER FOR ECOTECHNOLOGY

 New York State
 31

 Pollution Prevention Institute

## **NYSP2I Sustainable Food Program Snapshot**

### **Summary of Key Annual Objectives**

#### NYS Priority Initiatives

- Organize, market and facilitate stakeholder meetings
- Develop draft annual list of large food scraps generating businesses
- Perform 25 mile radius analyses for designated recycling facilities for NYSDEC capacity assessment
- · Research and report on new waste estimation methodology
- Manage reimbursement program for generators and businesses
- Outreach and Education
  - Organic Resource Locator map
  - Develop and disseminate educational resources and tools
- Technical Assistance
  - Complete projects lasting 4 6 months in length to reduce, donate or otherwise recycle organics
  - Provide brief assistance on an ongoing basis to help address immediate needs



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# **FUNDING for Munis and EFROs**

\$2 million available with first \$1 million prioritized to eligible projects that dedicate at least 50% of the total funding to serving environmental justice communities.

- Increased Residential Food Scraps Recycling Opportunities
- New or Expanded Food Scraps Recycling Programs and Facilities

Eligible Items:

- Staffing
- Travel
- Equipment & Vehicles

- Facility Expansion Costs
- 1-year pilot programs
- Depackagers/decontamination equipment

Grant Funding: 75% Match: 25%



# **Expanding Funding**

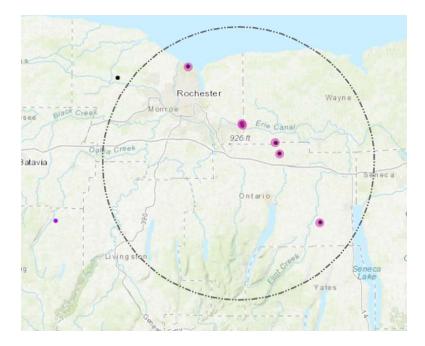
## DEC Municipal Funding for Food Scraps Recycling Initiatives

- Creating or expanding programs to increase residential food scraps recycling
- Creating or expanding food scraps recycling facilities
   \$1.25 Million ADDITIONAL FUNDS



## **Proposed & Potential Amendments**

CLCPA, State SWMP, legislation proposals, etc.



- Eliminate 25-mile radius for recycling requirement
- Reduce 2 tons/week threshold
- Expanding covered generator types



## **Other Food Scraps Recycling Laws**

States:

- 1. Connecticut 0.5 tons per week, 20-mile radius
- 2. Rhode Island 2023: 2 tpw, 2024 1 tpw, 30-miles
- 3. Massachusetts 0.5 tpw
- 4. New Jersey 1 tpw, 25-mile radius
- 5. Oregon 2022: 0.5 tpw, 2023: 0.125 tpw
- 6. Vermont all

Cities:

New York City, Seattle, San Francisco, Portland, etc.





# Stay updated on the law!

Sign up to receive announcements on the NYS Food Donation & Food Scraps Recycling law

Questions about the law? Email us at FoodScrapsLaw@dec.ny.gov

Questions about organics recycling? Email us at <a href="mailto:organicrecycling@dec.ny.gov">organicrecycling@dec.ny.gov</a>



# What's new in organics management?

Beyond food, what else is happening in NYS with organics management?



## DMM-7 Biosolids Program Policy

Establishes interim PFOS and PFOA sampling criteria for biosolids that are recycled in New York State.

This policy will remain in place until EPA issues risk-based standards applicable to recycled biosolids, which DEC will incorporate into further rulemaking. (EPA estimates Dec. 2024)

Policy will provide data for DEC to use in the development of future regulations.

Link: <a href="https://extapps.dec.ny.gov/docs/materials\_minerals\_pdf/dmm7.pdf">https://extapps.dec.ny.gov/docs/materials\_minerals\_pdf/dmm7.pdf</a>



# **Policy Details**

Within 180 days of policy issuance, all permitted 361-2 and 361-3 facilities accepting biosolids must:

- Develop & submit sampling plan to DEC
- Sample each source (WRRF) and submit data to DEC (DEC *may* fund)
- Draft EPA Method 1633 required (must analyze all PFAS compounds provided by that method)

\*DEC may require additional analyses using the SPLP (synthetic precipitation leaching procedure) and use those results in the determination.

| PFOA or PFOS in biosolids,<br>dry weight (ug/kg or ppb)* | Action Required for<br>Biosolids that are Recycled   |
|--|--|
| 20 or less   | No action required.  |
| 20 – 50  | Additional sampling<br>required. DEC will take<br>appropriate steps to<br>restrict recycling after 1<br>year if PFOS or PFOA levels<br>are not reduced to below<br>20 ppb or less. |
| 50 or greater  | DEC will take action to<br>prohibit recycling until<br>PFOS or PFOA<br>concentration is below 20<br>ppb.   |

## **New Technical Assistance & Research**

## **Cannabis Technical Assistance**

- Working with Office of Cannabis Management to encourage composting as a viable waste management method for cannabis grown for medicinal and adult-use
  - Regulations still in development
- Technical assistance to cannabis growers for onsite composting

## SUNY College of Environment Science & Forestry (ESF)

- Feasibility of composting non-marketable paper
- Assessing PFAS in biosolids



# **Upcoming Training Opportunities**

2023 & 2024 – Free Compost Site Workshop Series

- 1 Day Trainings (focused on composting food scraps)
- Will be hosted around the state
- Hosted by DEC, CET, James McSweeney & NYS experts

2025 - CREF Compost Operations Training Course (40 hour, 5 day course)



## **Third-Party CAFO Land Appliers**



## NEW REGISTRATION REQUIREMENTS

6 NYCRR Part 361-2.3(c) Final rulemaking effective July 22, 2023 180 day transition period

Who is required to register?

**Third-party CAFO land appliers**: a person who land applies manure or process wastewater from a CAFO onto land that is under the control of a CAFO. Does not include CAFO owner or employee.



## **Registration Requirements**

All land application must be done in accordance with the CAFO's field-specific current nutrient management plan

Signed contractor certification statement must be submitted to CAFO prior to application



## Calibration – Cornell Agronomy Fact Sheet # 18

Cornell University Cooperative Extension

Agronomy Fact Sheet Series

Fact Sheet #18

#### **Calibrating Manure Spreaders**

#### Introduction

Manure spreader calibration is an important step in nutrient management planning, Proper calibration can eliminate application rate guesswork. In this fact sheet four basic methods for calibrating manure spreaders are described.

#### Method 1: Using Drive-Over Scales

This method works well for solid, semi-solid, and liquid manure sources. Both the tractor and spreader need to be weighed, as weight from the spreader is transferred to the tractor drawbar. Ideally, use farm scales that weigh the tractor and spreader together. If farm scales are not available, portable scales can be used, weighing each axle individually (Figure 1). For tractors with dual tires or large flotation tires. put scales side-by-side for a wide enough pad; this typically means using four scales to weigh one axle, noting weights for each scale per axel.



Figure 1: With portable scales, weigh each axle separately

Step 1: Determine weight of the manure. Whether you are using portable or large-scale truck scales, first weigh the tractor and spreader empty, record each axle weight, and then repeat the procedure with a fully loaded spreader. The full weight minus the empty weight equals the weight of the manure.

Step 2: Determine application area. Measure the width and length of the application pattern. The width is easily measured with a

regular measuring tape or acreage measuring wheel. The length can also be determined using a GPS unit. Length times the width divided by 43,560 (square feet per acre) equals the total acreage covered.

#### Step 3: Calculate rate.

To determine the application rate in pounds per acre, divide the manure weight (step 1) by the application acreage (step 2). Divide this by 2000 to get the application rate in tons per acre. To convert to gallons per acre, a manure density value is needed. A manure test will give you the density in pounds per gallon. For guidelines on manure sampling, analysis and interpretation, see Agronomy Fact Sheet 38.

#### An example for Method 1:

Manure weight (full – empty): 33,720 lbs Manure density: 8.43 lbs/1000 galions Spreader pattern width: 40 feet, length: 500 feet

Application rate in gallons per acre: (Step 1) amount: 33720/8.43=4000 gallons (Step 2) area: (40\*500)/43560=0.46 acre (Step 3) rate: 4000/0.46=8712 gallons per acre

Method 2: Using Tarps This method can be used for solid and semisolid manure. It uses three tarps of a known size (e.g. 4 by 7 feet, 6 by 6 feet, or 56 by 56 inches) and 5-gallon buckets.

Sten 1: Determine tarn and bucket weight. Weigh each bucket separately with one tarp in each and record the weights.

Step 2: Stake sheets and apply manure. Stake the tarps at different intervals along the spreading pathway. Apply the manure, using the preferred gear and engine speed.

Step 3: Collect, weigh and determine rate. Carefully put the tarp, including manure, into the bucket and reweigh. Subtract the weight of the empty bucket plus tarp from the full weight. Repeat three times. Determine the average weight of manure in lbs and use Table 1 to derive the application rate in tons per acre.

College of Agriculture and Life Si

Table 1: Tarp calibration chart for Method 2\*.
Weight of Size of plastic sheet

| manure | 6' x 6'    | 4' x 7'                                | 56" x 56" |  |  |
|--------|------------|--|-----------|--|--|
| Pounds | Manure app | Manure application rate (tons per acre |           |  |  |
| 8      | 5          | 6                                      | 8         |  |  |
| 10     | 6          | 8                                      | 10        |  |  |
| 12     | 7          | 9                                      | 12        |  |  |
| 14     | 8          | 11                                     | 14        |  |  |
| 16     | 10         | 12                                     | 16        |  |  |
| 18     | 11         | 14                                     | 18        |  |  |
| 20     | 12         | 16                                     | 20        |  |  |
| 22     | 13         | 17                                     | 22        |  |  |
| 24     | 15         | 19                                     | 24        |  |  |
| 26     | 16         | 20                                     | 26        |  |  |
| 28     | 17         | 22                                     | 28        |  |  |
| 30     | 18         | 23                                     | 30        |  |  |
| 32     | 19         | 25                                     | 32        |  |  |
| 34     | 21         | 26                                     | 34        |  |  |
| 36     | 22         | 28                                     | 36        |  |  |
| 38     | 23         | 30                                     | 38        |  |  |
| 40     | 24         | 31                                     | 40        |  |  |

\*If you used a different tarp size, first calculate the area of an individual tarp (length x width in feet divided by 43,560 for size in acres), then divide the manure weight (in lbs) by the calculated acreage. Divide by 2000 for tons/acre.

An example for Method 2:

Size of three tarps used: 6 feet by 6 feet Weight of the manure: 20 lbs, 21 lbs, and 19 lbs

Application rate in tons per acre

Average amount for the three tarps: 20 lbs From Table 1: manure application rate = 12 tons/acre

#### Method 3: Counting Loads

Field size and average manure load (in tons or gallons per load) can be used to determine rate of application of solid, semi-solid, and liquid manure sources. To determine the weight or volume of the spreader, weigh the tractor and spreader as in Method 1, or, if scales are not available, use the manufacturer listed volume of the spreader. If you use the listed volume, remember that manure foams so assume 90% of the stated capacity unless you see manure up to the fill port (in that case, assume 100%). If the spreader capacity is measured in bushels, assume 1 bushel equals 1.25 cubic feet. A cubic foot can vary in weight depending on the density of the manure. There are 7.5 gallons in a cubic foot so the density of the manure (in lbs per cubic foot) can be determined by weighing 5-gallon bucket filled with manure and multiplying the weight by 1.5.

#### Method 4: Flow Meters

Flow meters are increasingly being used to set and record liquid manure application rates. Flow meters can be installed on the manure application equipment itself (draghose systems,

|  | Life Scieni |
|--|-------------|
|  |             |

tank spreaders) and/or for hose systems on the pump at the manure source. Installation of two flow meters in draphose systems (at the pump and on the applicator in the field) has the benefits of providing an additional check on system operation and verifying that each flow meter is functioning correctly. Calibration of meters (flow per minute) can be done by recording time during emptying a known volume or mass of manure. Meter accuracy can also be confirmed using the manufacture prescribed verification process to check measured outputs against the original calibration certificate. If any parameter is out of the labeled range, the meter must be returned to the supplier for repair/re-calibration. Some companies offer on-line tools that may help convert gallon per min rates to gallon per acre rates targeted in nutrient management plans.

#### In Summary

Spreader calibration is key for management of manure nutrients. Calibration is requirement for Concentrated Animal Feeding Operations (CAFOs) and other farms following the Natural Resources Conservation Service (NRCS) Practice Standard 590. Here four calibration methods are presented.

#### Additional Resources

- Martin, J., and D. Beegle (2014). Manure Spreader Calibration. Agronomy Facts 68. Penn State Extension. https://extension.psu.edu/manure-spreader-calibration. Know How Much You Hau! Nutrient and Pest Management Program. University of Wisconsin, Madison.
- https://lpelc.org/wp-content/uploads/2019/03/Section-7-Manure-Spreader-Calibration.pdf.

#### Disclaimer

This fact sheet reflects the current (and past) authors' best effort to interpret a complex body of scientific research, and to translate this into practical management options. Following the guidance provided in this fact sheet does not assure compliance with any applicable law, rule, regulation or standard, or the achievement of discharge levels from agricultural land.



http://nmsp.cals.cornell.edu

2021 (originally released in 2007 wi co-authorship by Kristin Bossard)

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## **Thank You!**



Molly Trembley, P.E. Organics Reduction and Recycling NYSDEC Molly.Trembley@dec.ny.gov

