Soil Builders – Education in Action

Module 2: Drivers for Clean Water & Healthy Soils

Composting Association of Vermont

Founded in 2002

We believe *that increasing the use of compost in our communities will improve soil health, water quality, and our resilience to climate change*

Mission:

Advance production and use of compost as vital to soil health through practices that contribute to water quality, plant vigor, and environmental resilience

Demonstrate the value of compost through education, policy, outreach, and partnerships to reduce waste, capture energy, and create jobs

501c3 - cooperative, stakeholder driven approach in our work

Soil Builders – Education in Action

Module 2: Drivers for Clean Water & Healthy Soils

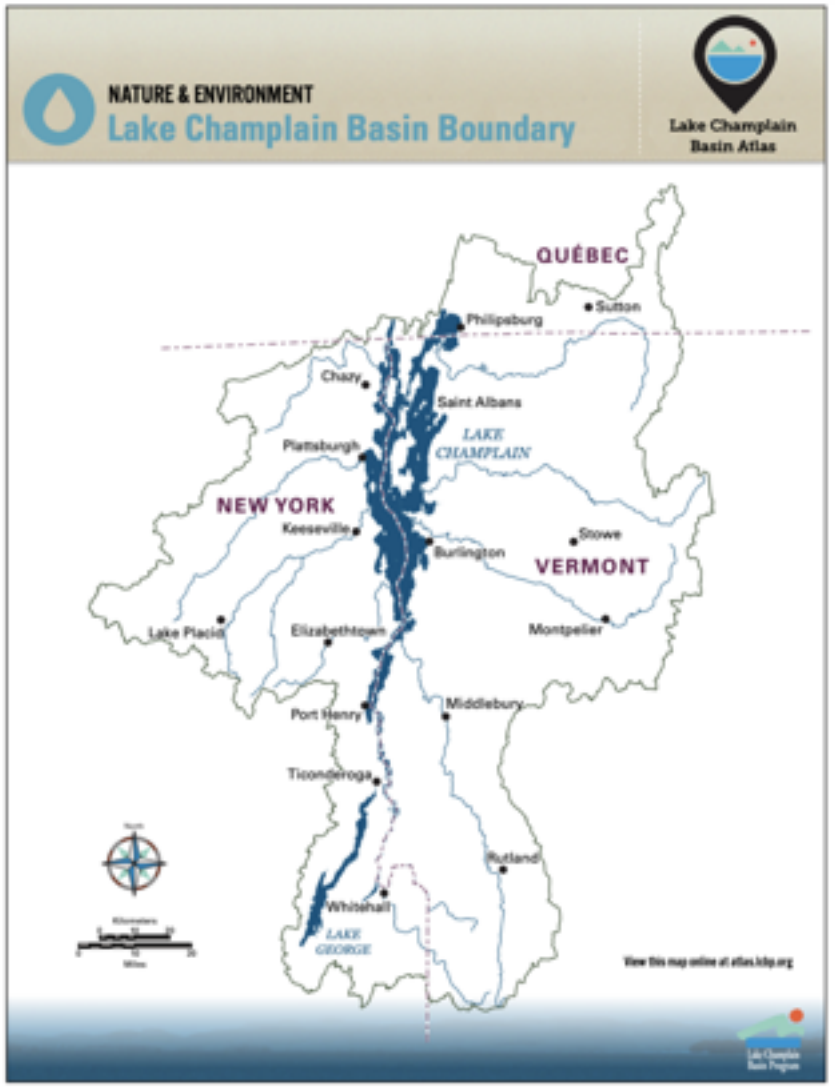
- Natasha Duarte, Composting Association of Vermont
- Elly Ventura, Lamoille Regional Solid Waste Management District

Soil Builders Workshops

Compost-related eco-literacy for Lake Champlain Basin decision-makers, professionals and advocates.

Compost increases soil stability, fertility, water infiltration, and moisture retention.

Using compost in land management practices is a critical strategy for climate adaptation.



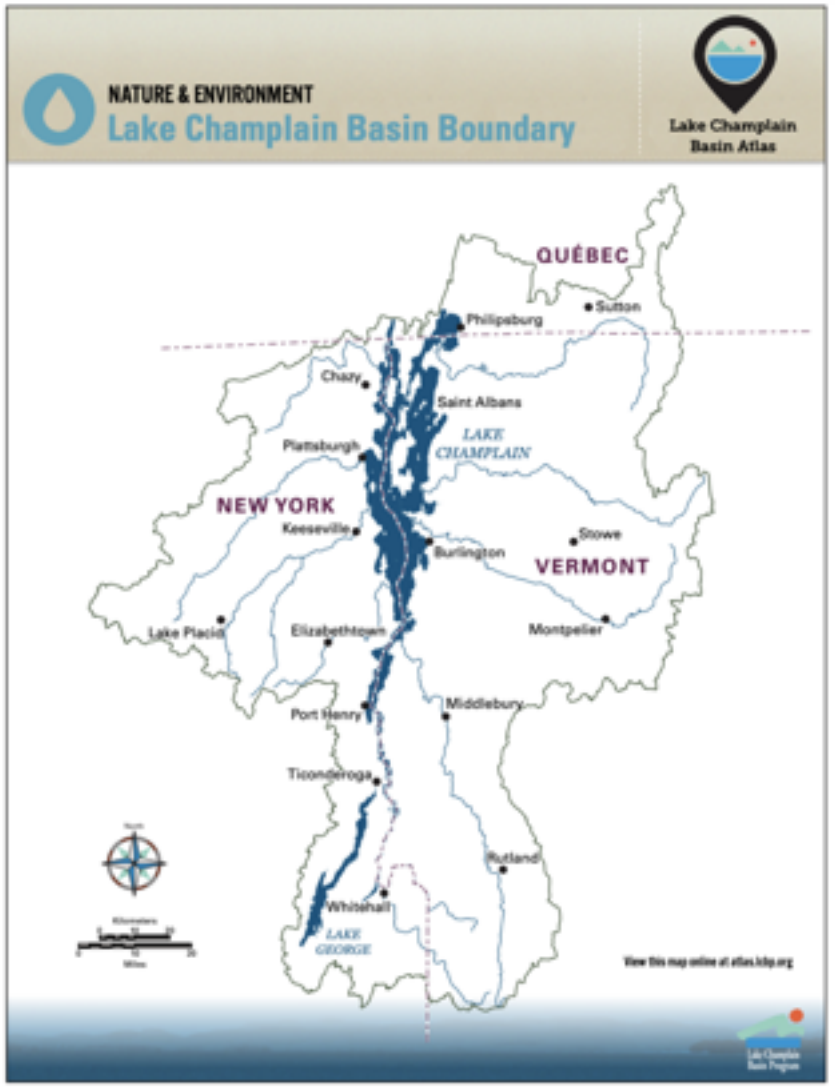
Soil Builders Workshop Topics

Soil health & water quality

Drivers for clean water & healthy soil

Best Management Practices for compost & compost-based products

Education in action – next steps



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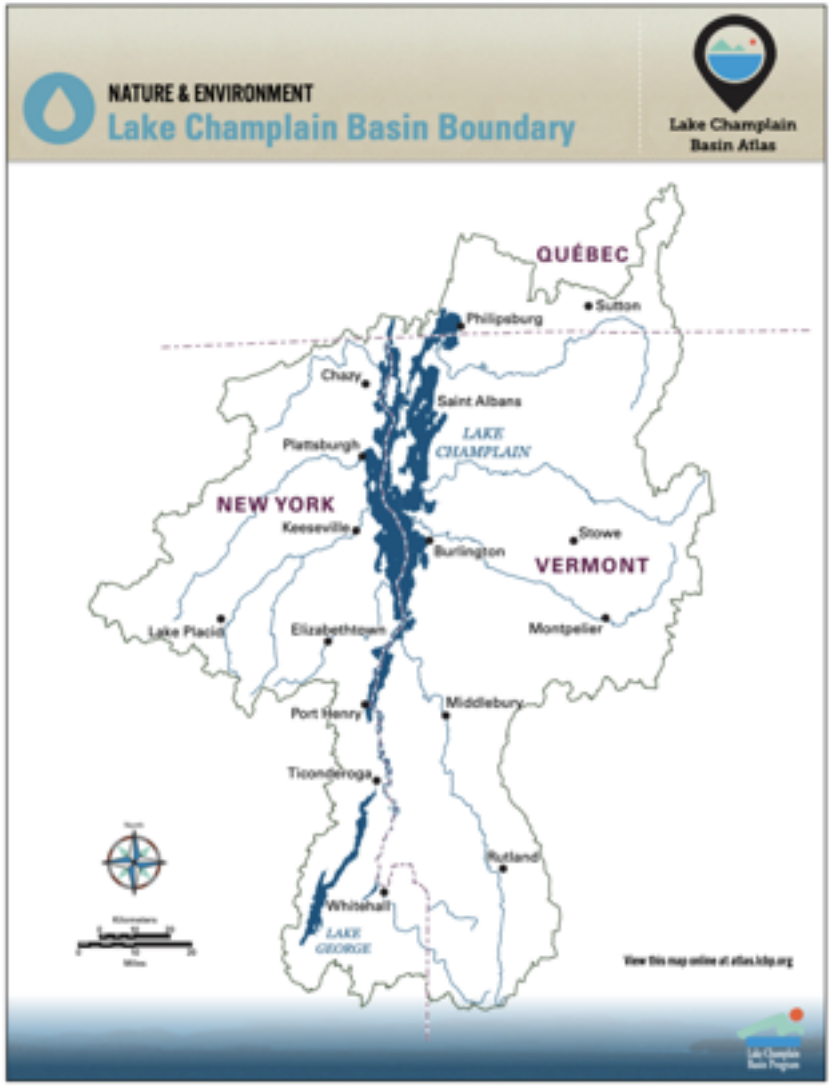

Project Partners

- Athena Lee Bradley, Compost Consultant, CAV Board Member
- Mark Companion, Lake Champlain Sea Grant
- Chuck Duprey, Naturcycle
- Brian Jerose, Agrilabs Technologies Inc., CAV Board Member
- Deb Neher, UVM
- Elly Ventura, Lamoille Regional Solid Waste Management District, CAV Board Member

Additional Thanks

- CAV Board of Directors

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We've Got Work To Do

	% of World Population	% of Trash Created	Recycling/ Composting Rate	Plastic Recycling Rate
United States	4%	12%	35%	9%
China	36%	27%	n/a	22%
India			66%	n/a


How did we get here?

It Doesn't Have To Be Confusing

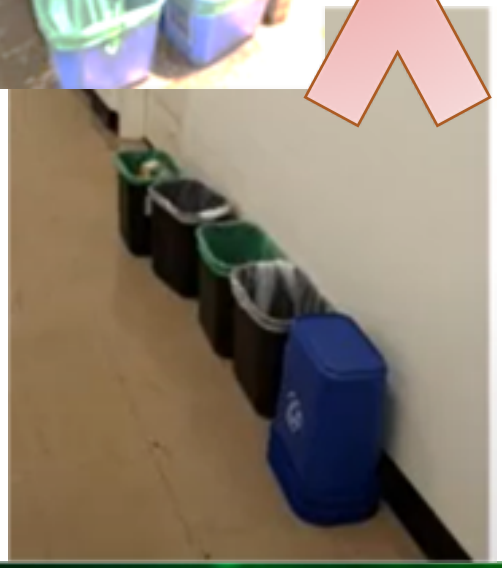


Photo Credit: Busch Systems Webinar | The Future of Office Waste & Recycling Collections
VT ANR Presentation | Food Scrap Management Requirements June 2020

Image credit: Waste360.com

Every year, U.S. landfills and trash incinerators receive **167 MILLION TONS** of garbage.

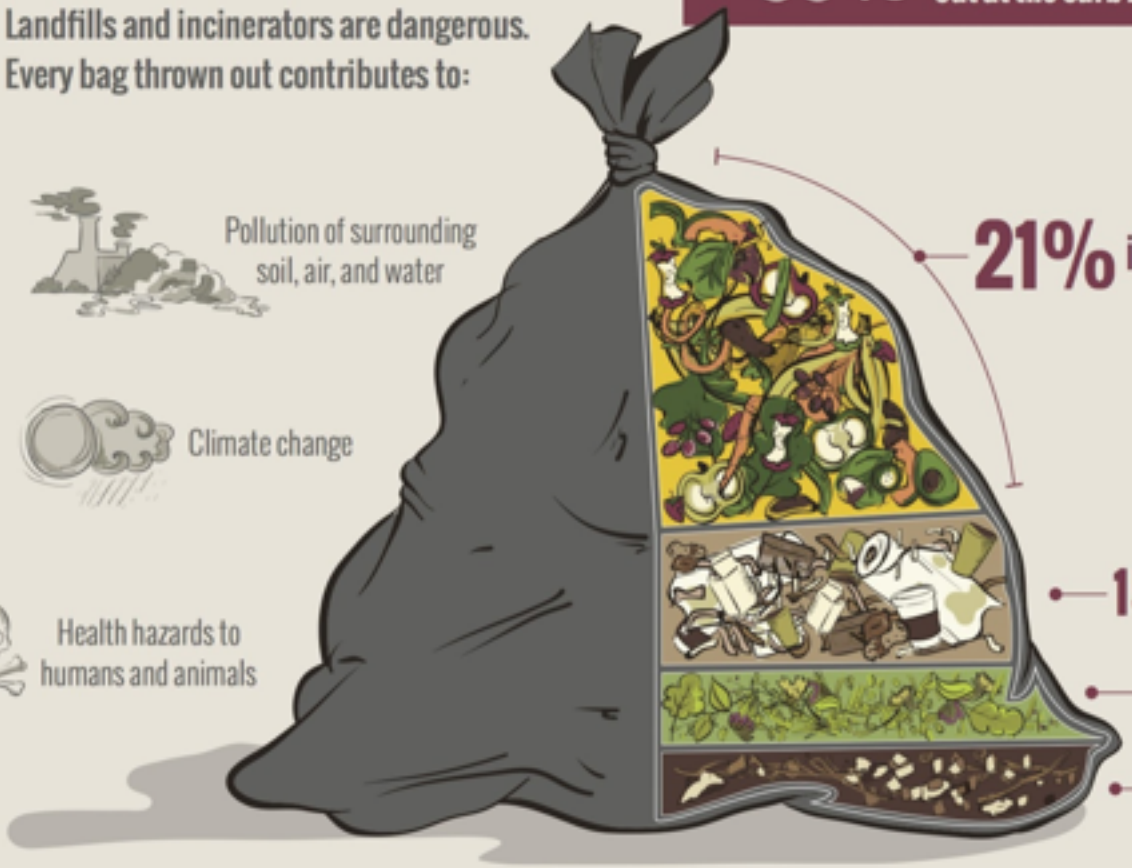
>50% of typical municipal garbage set out at the curb is compostable.

Landfills and incinerators are dangerous. Every bag thrown out contributes to:

Pollution of surrounding soil, air, and water

Climate change

Health hazards to humans and animals



21% is food scraps alone

15% paper/paperboard

8% yard trimmings

8% wood waste

SOURCES:

Brenda Platt, Nora Goldstein, Craig Coker, and Sally Brown, *The State of Composting in the U.S.: What, Why, Where, & How*, Institute for Local Self-Reliance (ILSR), June 2015.

US EPA, *Advancing Sustainable Materials Management: Facts and Figures 2013*, June 2015, pp. 12, 46.

Brenda Platt, Eric Lombardi, and David Ciplet, *Stop Trashing the Climate*, Institute for Local Self-Reliance (ILSR), 2008.

Brenda Platt, Bobby Bell, and Cameron Harsh, *Pay Dirt: Composting in Maryland to Reduce Waste, Create Jobs & Protect the Bay*, Institute for Local Self-Reliance (ILSR), May 2013.

Mike Ewall, *Trash Incineration Factsheet*, Energy Justice Network web page, http://www.energyjustice.net, accessed April 2016.

ILSR INSTITUTE FOR Local Self-Reliance

To learn more, visit: ilsr.org/compost-impacts

FOOD WASTE IN THE U.S. IS...

EXCESSIVE

40%

OF ALL FOOD PRODUCED IN THE U.S. IS WASTED

133 BILLION POUNDS

Food wasted per year. That represents 1,249 calories per person, per day.

EXPENSIVE

$161 BILLION

Uneaten food at retailers, restaurants, and homes costs $161 billion annually

$1,500

Per capita, this amounts to over $1,500 for a family of four

ENVIRONMENTALLY HARMFUL

Food makes up 20% of landfill weight—the single largest municipal waste source

The methane released by food is a greenhouse gas 21 times more powerful than carbon dioxide

image credit: https://pingree.house.gov/foodwaste/

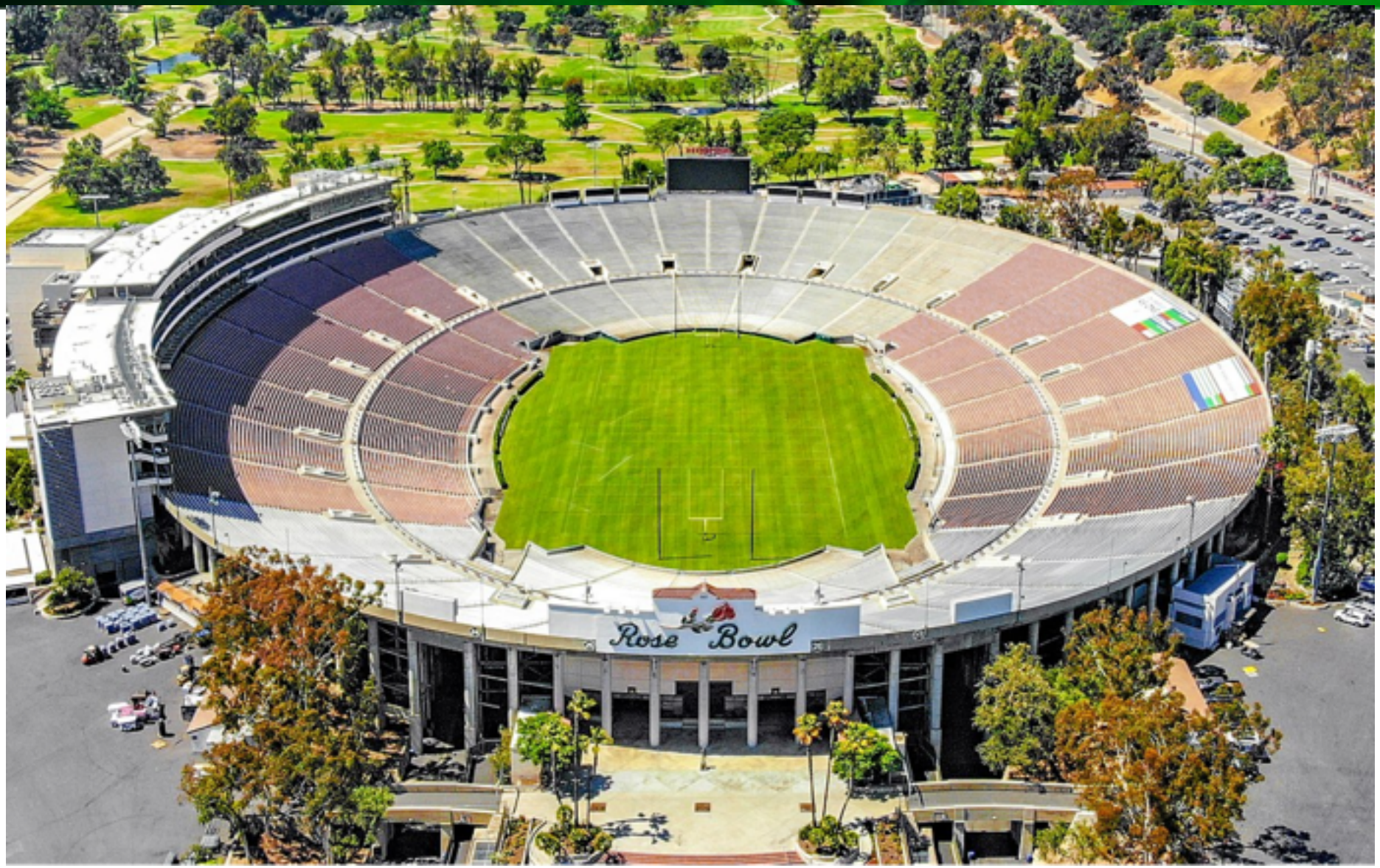


photo credit: wikipedia, view from the south 2018

photo credit: [Food-Insecurity-Fact-Sheet.jpg (738×956) (eggnutritioncenter.org)]

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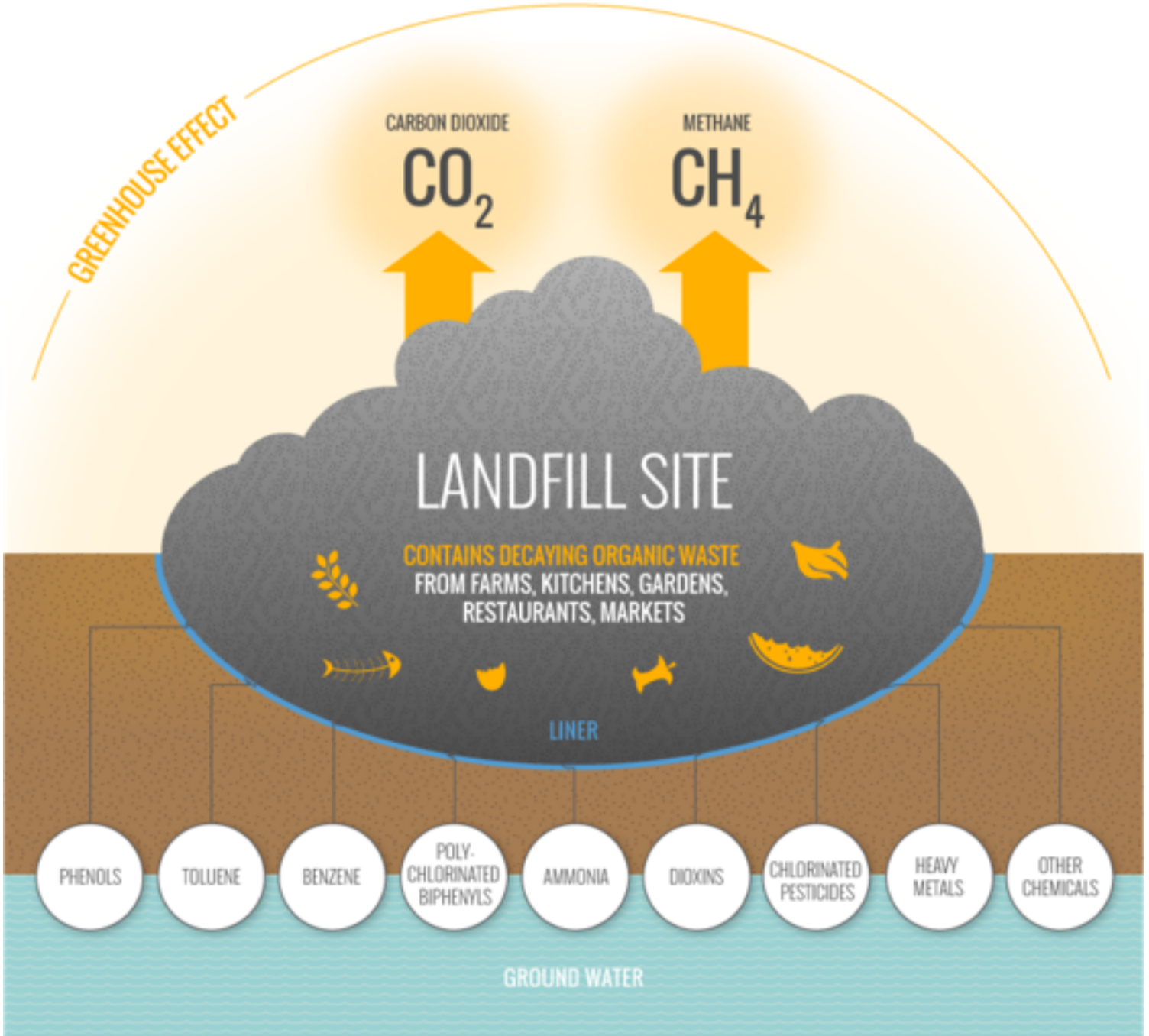
Growing | Harvest | Distribution | Storage | Processing | On the shelves | In the home/biz



Reduce Food Waste by 50% by 2030

- Partnership between the USDA and the EPA
- Announced in September 2016
- Supported by Food Retailers, Agricultural Industry and Charitable Organizations
  - US Composting Council
  - Feeding America
  - Food Marketing Institute


GREENHOUSE EFFECT
CARBON DIOXIDE
CO_2
METHANE
CH_4
LANDFILL SITE
CONTAINS DECAYING ORGANIC WASTE
FROM FARMS, KITCHENS, GARDENS,
RESTAURANTS, MARKETS
LINER
PHENOLS
TOLUENE
BENZENE
POLY-CHLORINATED BIPHENYLS
AMMONIA
DIOXINS
CHLORINATED PESTICIDES
HEAVY METALS
OTHER CHEMICALS
GROUND WATER

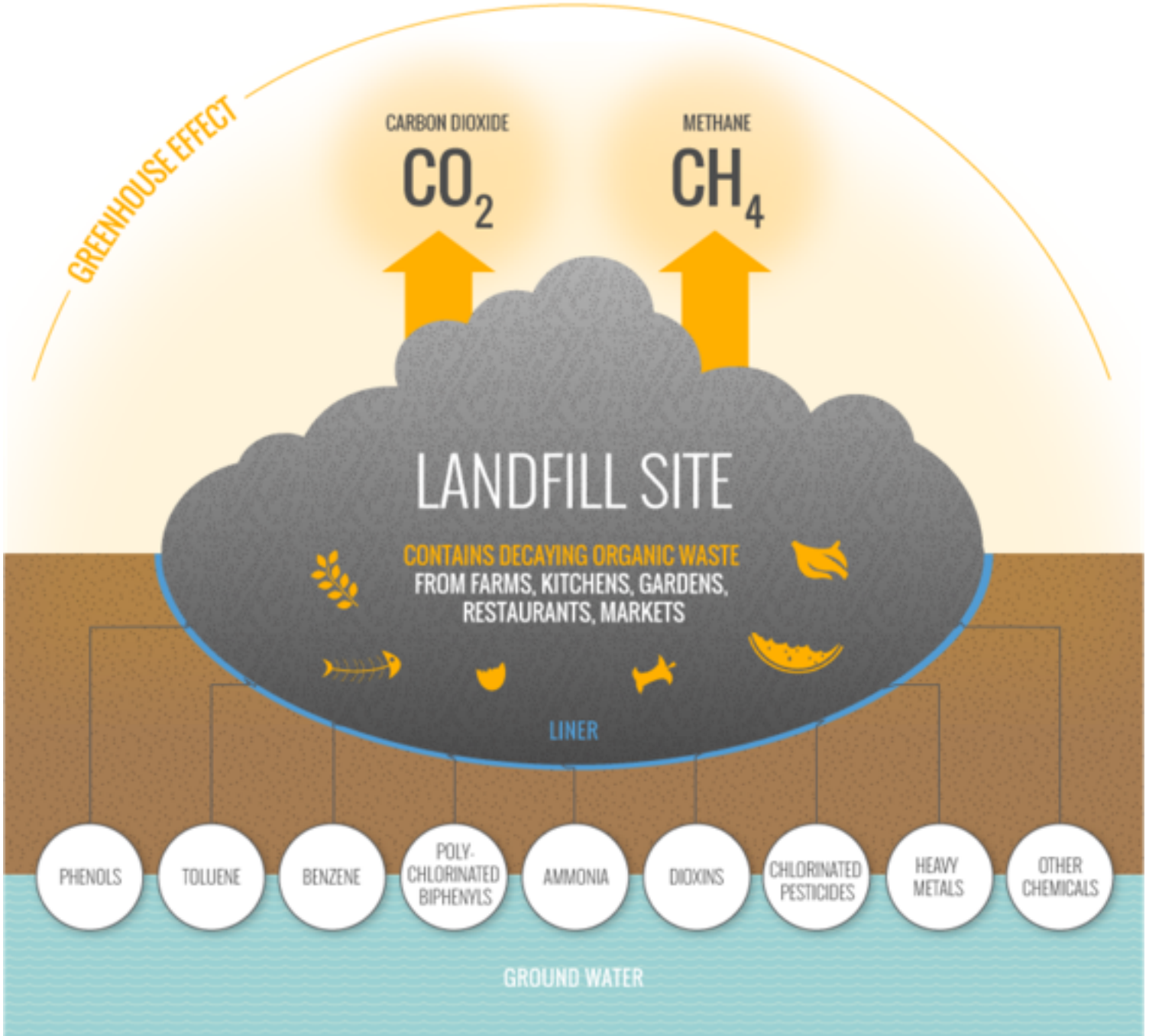
Heat Trapping Greenhouse Gases
Methane vs. Carbon Dioxide

1 lb. methane

23 lbs. carbon dioxide

1 lb. of methane has the equivalent heat trapping ability of 23 lbs. of carbon dioxide

NWFarmsandFood.com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Vermont's Universal Recycling Law (Act 148)

- Passed unanimously in 2012
- Rolled out from 2014-2020

<u>The goal:</u>

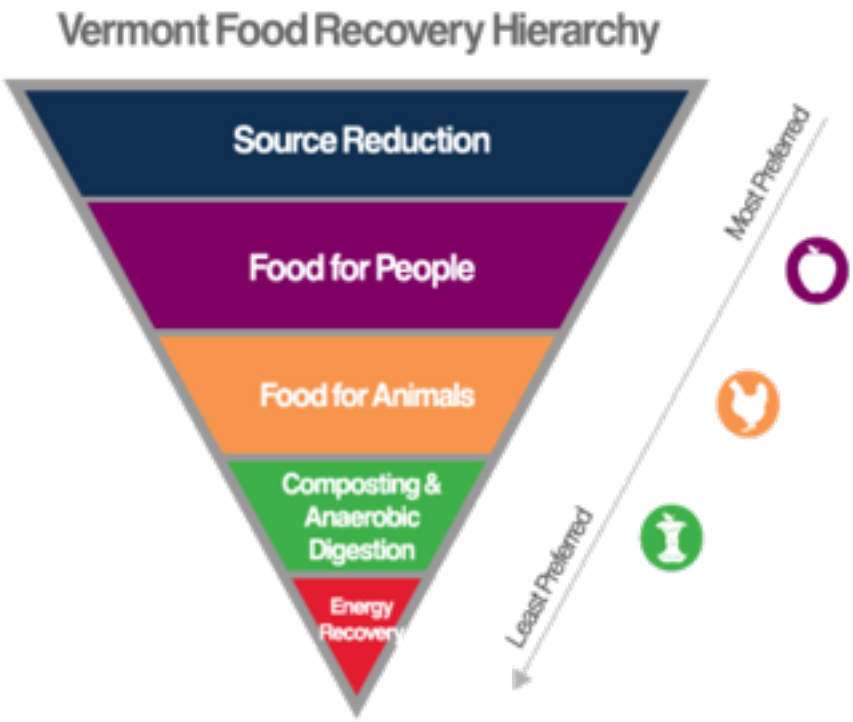
Improve capture and diversion rates to prevent valuable materials from being landfilled

Food Scraps Disposal Ban

Phases for food scrap generators within 20 miles of a facility

- 2014 > 104 tons/year (2 tons/wk)
- 2015 > 52 tons/year (1 ton/wk)
- 2016 > 26 tons/year ($^1/_2$ ton/wk)
- 2017 > 18 tons/year ($^1/_3$ ton/wk)

➢ 2020 all food scraps banned regardless of volume and distance



Vermont's Clean Water Bill (Act 64, 2015)

Clean Waters are a Critical Community Asset

- Protect health
- Preserve the natural beauty
- Enhance the ecological values of our waters
- Are an essential legacy for Vermont's Future Generations

Image credit: 1778011 from Pixabay

Vermont's Clean Water Bill (Act 64, 2015)

"Healthy soil means soil that has a well-developed, porous structure, is chemically balanced, supports diverse microbial communities, and has abundant organic matter."

***The major problem is not runoff but infiltration* - and this is where increasing soil health really comes into play.**

Lake Champlain, TMDL Implementation Plan

Required Agricultural Practices (RAPs)

- Nutrient, manure, & waste storage standards
- Recommendations for soil health practices
- Requirements for vegetated buffer zones & livestock exclusion from surface water

Stormwater From Developed Lands

- Reduce or prevent water quality & flooding impacts during & after development
- Minimize stormwater impacts through construction and post-construction BMPs
- VT Stormwater Management Manual updated (2017)

Stormwater Permit Requirements

Erosion Prevention & Sediment Control

- Capture/filter runoff – perimeter & inlet control
- Runoff Reduction – site stabilization is required

Post-construction soil quality requirement

- Amend distrubed soil to 4+% organic matter content

Municipal Roads General Permit Requirements

- Stabilize road drainage systems
- Reduce potential road pollutants (excess nutrients, sediment, trace heavy metals, hydrocarbons, road salt)

✓ Opportunities to utilize compost to meet water quality & runoff reduction goals

What Is Compost?

- A soil amendment rich in organic matter made by the controlled biological decomposition of organic materials
- Made from a recipe of organic wastes
- Must go through an aerobic heating and curing process to be biologically stable and mature
- Improves biological, physical and chemical characteristics of soils




Estimated Carbon to Nitrogen Ratios

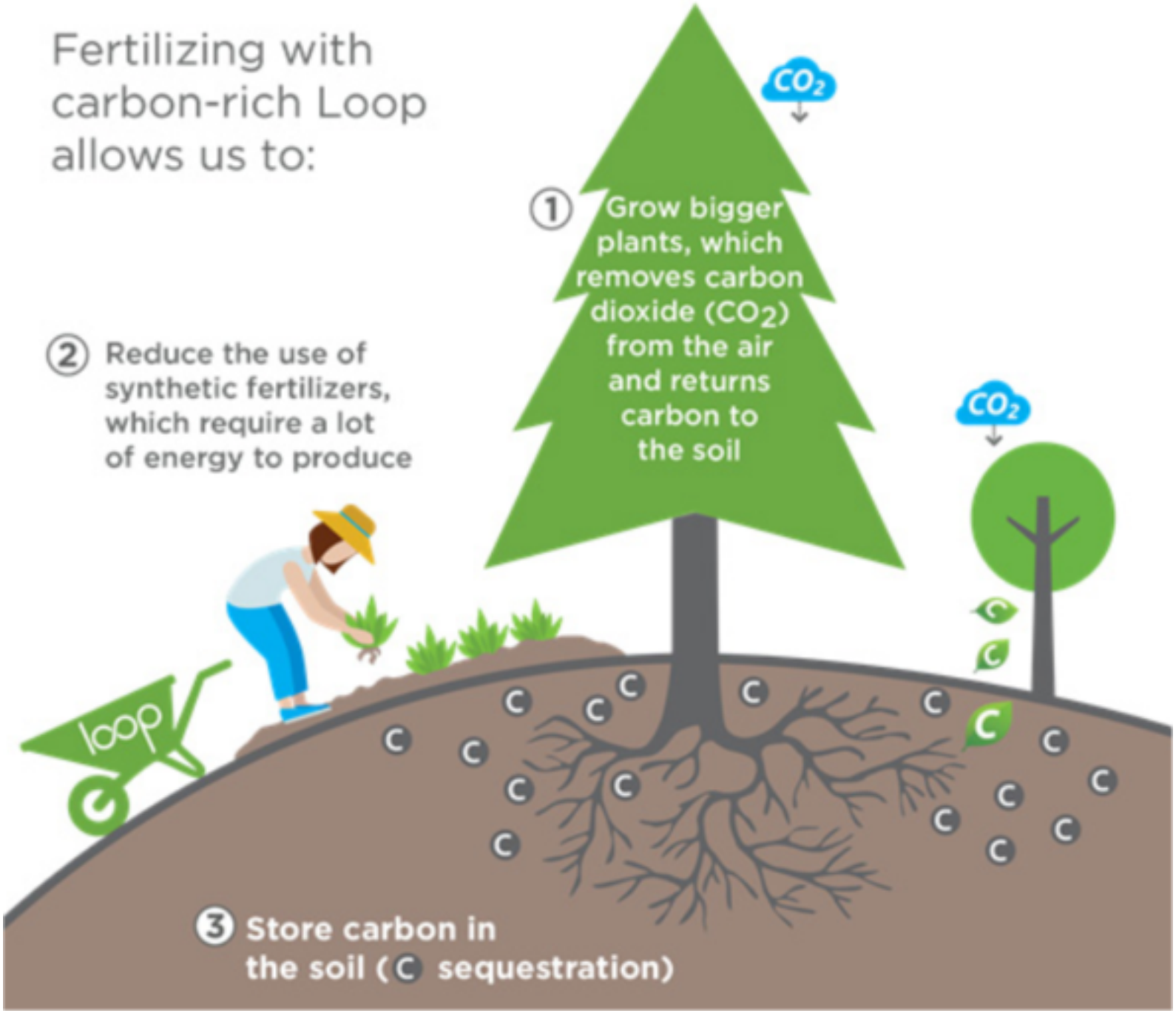
Carbon Sources	C:N
Yard wastes (leaves, dried grass clippings, chopped branches)	50 - 90:1
Straw	60 - 80:1
Paper (shredded)	160 - 180:1
Cardboard (shredded)	250 - 350:1
Wood shavings, chips, dust	250 - 500:1
Nitrogen Sources	**C:N**
Vegetable scraps	10 – 30:1
Fruit scraps	10 – 30:1
Grass & garden gleanings	10 – 20:1
Chicken manure	10 – 25:1
Cow manure	20 – 30:1
Horse manure	25 – 30:1

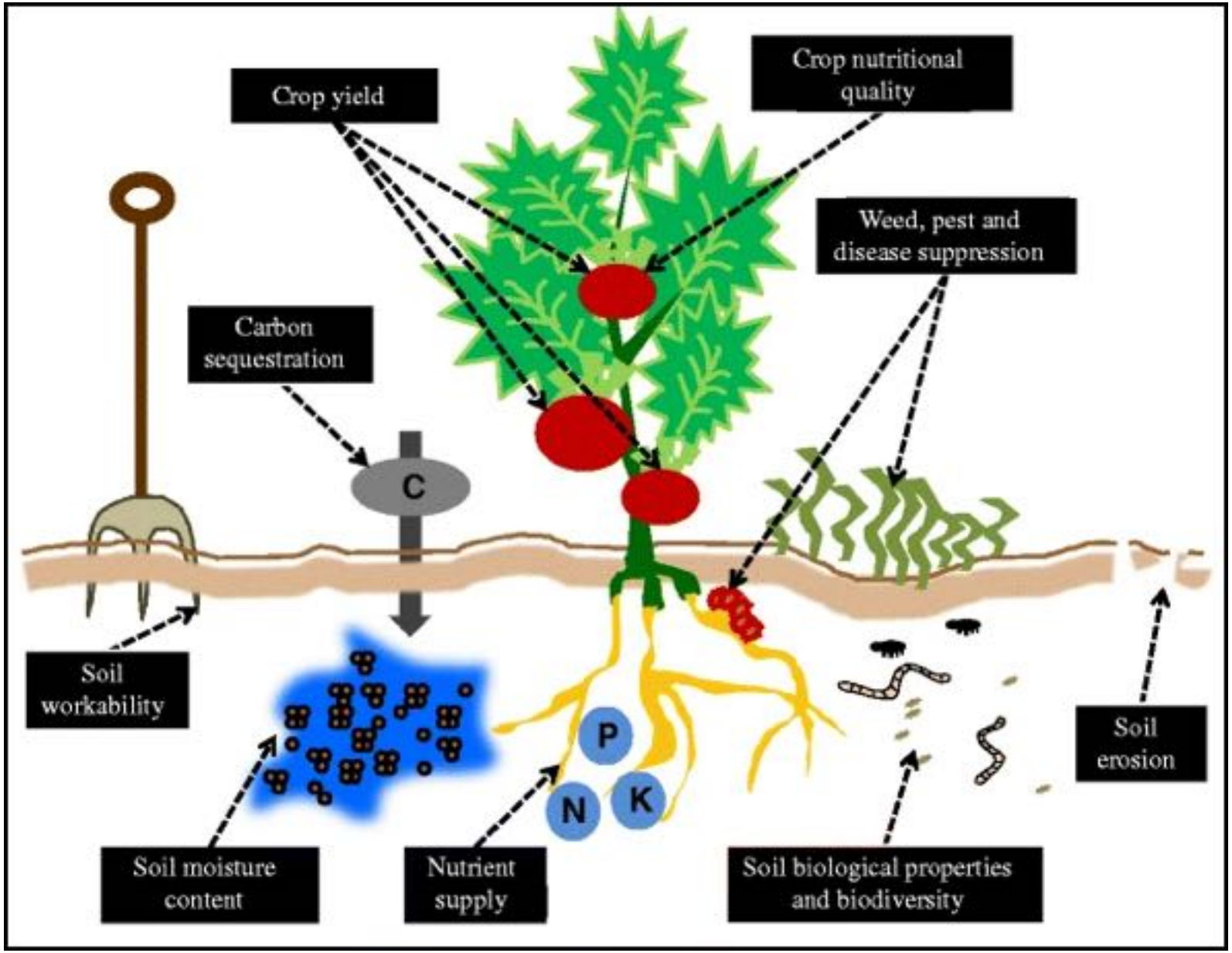
Adapted from Robert Rynk, "*On-Farm Composting Handbook*," Natural Resource, Agriculture, and Engineering Service, 1992.

Composting Association of Vermont (CAV)

Reclaiming Organic Residuals For Good

Fertilizing with carbon-rich Loop allows us to:




Crop yield
Crop nutritional quality
Weed, pest and disease suppression
Carbon sequestration
C
Soil workability
Soil erosion
P
N
K
Soil moisture content
Nutrient supply
Soil biological properties and biodiversity

VT landfills ~77,000 tons of food scraps each year.

Composting the scraps instead of trashing them would...

reduce greenhouse gas emissions as much as not driving ~115 million miles.

That's like driving around Earth 4,629 times!

April 2019

Composting Creates Jobs

- On a per ton basis, diverting organics from landfills and making compost employs 2-4x more workers than landfills
  - Supports local economy & keeps these resources available to build healthy soil
- Using compost in green infrastructure creates even more jobs:
  - Erosion prevention & sediment control
  - Rain gardens
  - Green roofs
  - Revegetation of disturbed sites

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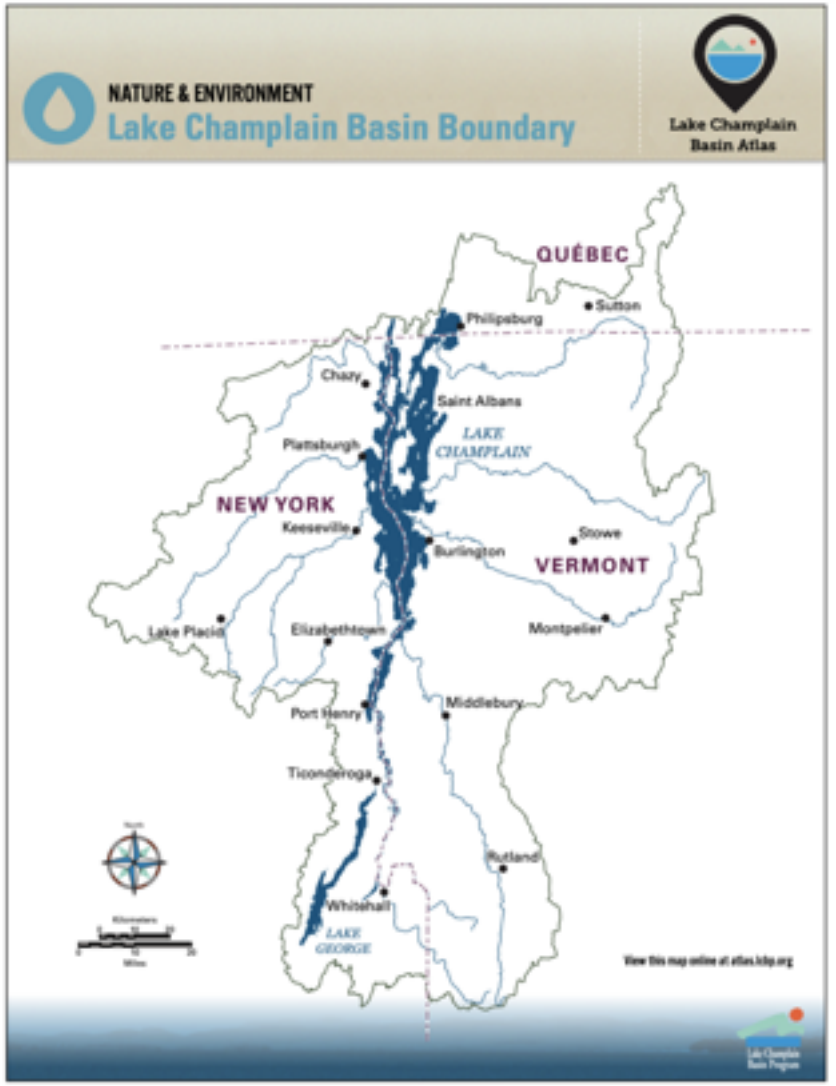

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