US EPA

Organic Materials Management Update

Past, Present, Future

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Background:

- 1995

	Generated	Recycled
Food waste	14.1 M tons	3.4%
Yard waste	30.6 M tons	22.9%

To reach national recycling goals we looked at the largest fractions of the waste stream.

12 years later …

Background:

	Generated	Recycled
1995		
Food waste	14.1 M tons	3.4%
Yard waste	30.6 M tons	22.9%
2007		
Food waste	31.3 M tons	2.6%
Yard waste	32.4 M tons	64.1%

What Happened?

- Focused on yard waste
- Recognized that the most sustainable way to reduce the organic waste stream was for the material to have a greater value outside the landfill than in.
- How? - Stimulate demand for products made from organic waste materials – especially compost.

What EPA Did:

- Organic Materials Management Strategies study
- Created the *GreenScapes* Program
- Funded the USCC to develop compost standards (STA Program)
- Funded the USCC to develop DOT compost standards to promote compost use on roadsides
- Developed national Best Management Practices (BMPs) on compost use for erosion control
- Revised the CPG to include all composts & fertilizers made from recycled organic materials for fed. use
- Conducted workshops with industry & EPA regions
- Developed myriad of tools, research and outreach materials on the beneficial uses of compost

- **Analysis of Composting as an Environmental Remediation Technology**
  - Summarizes the available information on the use of compost for managing hazardous waste streams (as well as other applications) and indicates possible areas for future investigations.
- **Biosolids Generation, Use, and Disposal in the United States (PDF)**
  - Quantifies the amount of biosolids (historically known as sewage sludge) generated, used, and disposed of in the United States in 1998. Provides managers of municipal solid waste facilities with an overview of the various management options available for biosolids (e.g., composting, land application, incineration).
- **Biosolids Technology Fact Sheet - In-Vessel Composting of Biosolids**
  - Provides an excellent overview of in-vessel composting, including the advantages and disadvantages.
- **Compost Use on State Highway Applications**
  - Funded by EPA, the Composting Council Research and Education Foundation (CCREF), in conjunction with the United States Composting Council (USCC), developed this publication to promote compost use on state and local 'roadside' applications.
- **Compost Use in Forest Land Restoration**
  - Provides examples of using compost to successfully restore lands disturbed by forest management activities in the Pacific Northwest; many can be expanded for use in other environments with consideration of local conditions.

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- **Compost—New Applications For an Age-Old Technology (Series of 5 fact sheets)**
- **Innovative Uses of Compost: Bioremediation and Pollution Prevention**
  - Use of compost bioremediation to restore contaminated soils, manage stormwater, control odors, and degrade volatile organic compounds.
- **Innovative Uses of Compost: Composting of Soils Contaminated By Explosives**
  - Use of compost to remediate soil contaminated with explosives.
- **Innovative Uses of Compost: Disease Control For Plants and Animals**
  - Use of compost-enriched soil to help suppress diseases and ward off pests.
- **Innovative Uses of Compost: Erosion Control, Turf Remediation, and Landscaping (**
  - Use of compost-enriched soil to reduce erosion and nutrient run-off, alleviate soil compaction, and help control disease and pest infestation in plants.
- **Innovative Uses of Compost: Reforestation, Wetlands Restoration, and Habitat Revitalization**
  - Use of compost to restore forests, regain wetlands, and revitalize habitats; provides case studies.
- **Composting, Yard Trimmings, and Municipal Solid Waste**
  - Examines planning, siting, designing, and operating composting facilities. It also discusses basic composting principles; collection methods; processing methods, technologies, and odor control; environmental, health, and safety concerns; state legislation and initiatives; potential end-users; product quality and marketing; community involvement; and economics.

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- **Construction Site Stormwater Runoff Control Best Management Practices (BMP) Fact Sheets**
  - **Compost Blankets**
    - Describes how compost blankets can be used to control erosion and retain sediment.
  - **Compost Filter Berms**
    - Explains how compost filter berms can be used in place of a traditional sediment and erosion control tool such as a silt fence.
  - **Compost Filter Socks**
    - Describes how compost filter socks can be used to control erosion and retain sediment in place of silt fences or straw bales.
- **Decision-Maker's Guide to Solid Waste Management, Second Edition**
  - Chapter 7 of EPA's Decision-Maker's Guide to Solid Waste Management provides guidance on environmentally safe ways to compost.
- **The Effects of Composted Organic Materials on the Growth Factors for Hardwood and Softwood Tree Seedlings**
  - Provides the results of a study designed to demonstrate the effects of three types of compost on the growth and survival rates of hardwood and softwood tree seedlings. The results of this study after 3 ½ years of monitoring indicate that compost mulching is consistently superior to straw mulching for revegitating severely disturbed areas of soil.
- **Fact Sheet: Cover Up with Compost**
  - Provides information on compost as a landfill cover.

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- **Markets for Composting**
  - EPA established a national goal of reducing municipal solid waste disposal by 25 percent through source reduction and recycling (including composting) as a means of reducing the nation's dependence on landfills. Composting the organic portions of the MSW stream is one management technique that is being employed to help attain the EPA goal.
- **Organic Materials Management Strategies**
  - Describes seven composting strategies for organic materials in the US municipal solid waste stream and presents an analysis of the benefits and costs of each strategy, the potential for diverting organic materials from landfills or waste-to-energy facilities, and the potential markets for diverted organic materials.
- **Quest for Less: Composting**
  - Provides resources on composting for teacher of grades K-8.
- **Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks - Chapter 5. Composting**
  - Presents the results of an in-depth analysis to determine the net GHG impacts of composting yard trimmings and food discards.
- **Tribal Waste Journal: Tribal Composting Nourishes Land and Tradition**
  - Focuses on Tribal composting programs and practices.

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- **Waste Prevention, Recycling, and Composting Options: Lessons from 30 Communities**
  - Analyzes the actual operating experience of 30 diverse communities–some with high materials recovery rates, others with model waste reduction initiatives–and draws lessons for communities wanting to strengthen their own programs. Addresses waste prevention strategies and comprehensive source-separation composting programs; improving residential, commercial and institutional recovery levels; and targeting construction and demolition debris for recovery.
- **WasteWise Update: Recovering Organic Wastes—Giving Back to Mother Nature (PDF)**
  - Highlights a number of organic waste diversion and recovery options implemented by WasteWise partners, including composting, vermicomposting, mulching and chipping, grasscycling, and donation. Provides basic information on the science of composting and tips on getting started with organics recovery.
- **GreenScapes: Environmentally Beneficial Landscaping**
  - Describes EPA's GreenScapes program, providing cost-efficient and environmentally friendly solutions for large-scale landscaping.
- **Greenscaping – The Easier Way to a Greener, Healthier Yard**
  - Encourages consumers to grasscycle, mulch, and compost to reduce the amount of yard waste in the waste stream and provides details on how to compost and how to use compost.

www.epa.gov/compost

GreenScapes

Environmentally Beneficial Landscaping

Building Sustainability
From the Ground Up

GreenScapes was created to teach and promote:

- **Reduce** organic waste generation at the source
- **Reuse** organic wastes (on-site & off-site)
- **Recycle** (compost) organic wastes (on-site & off-site)
- **Rebuy** recycled organic material content products – mulch & **compost**

Reduce:

- or eliminate plastic silt fencing... and worse

–Substitute with blankets, berms, and filter-socks made of compost.

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Compost provides:

- Superior filtration & erosion prevention/control
- More easily installed & maintained
- Control & reduction of non-point source pollution.
- Does not require removal or disposal from site once job is complete

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Ways to Reuse:

- **Chip trees and wood waste into mulch.**
  - **Saves money on disposal costs and commercial mulch purchases**
  - **Provides benefits of mulch:**
    - **Moisture retention**
    - **Weed prevention**
    - **Erosion control**

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Recycle:

- **Waste** - Send green waste & food waste that cannot be composted on-site to a local composting facility.

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Rebuy:

- ***Rebuying = re-thinking your purchasing habits.***

- Look for products that meet your needs but have a better environmental profile than your current product purchases.

Rebuy:

- ***Rebuying is the final and essential step to "closing the loop" using the resources that were reclaimed and recycled.***

Consider:

- **Recycled content (incl mulch & compost)**
- **Biobased products (incl. fuels & lubricants)**
- **Renewable energy & products**
- **Energy & water efficient**

Rebuying is key to sustainability by putting valuable materials back to work .

<u>Change your thinking</u>:

It's not waste – it's another resource.

Know the Difference:

- **Degradable**
- **Biodegradable**
- **Compostable**
  - Products are being developed that are **compostable**. This type of material will compost quickly and safely in a well-managed composting site.

Ideally, no organic materials should go to a landfill

- Two specifications that identify plastics as biodegradable and compostable have been developed by the ***American Society for Testing and Materials:***

  - **ASTM D6400** (Standard Specification for Compostable Plastics) and
  - **ASTM D6868** (Standard Specification for Biodegradable Plastics Used as Coatings on Paper and Other Compostable Substrates).

COMPOSTABLE
Biodegradable Products Institute | US COMPOSTING COUNCIL ™

US COMPOSTING COUNCIL
Seal of Testing Assurance

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Rebuy:

- **Use mulch and compost for erosion & sediment control, reduced irrigation, drought resistance, weed control, soil health & temperature control, etc.,**
- **Buy mulch or compost in bulk**
- **Consider blower for application**

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Using compost & mulch to go from this:

To This:

Parking Lot Island Infiltration Areas

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Did You Know?:

- Most post-construction soils have only approx. **1% soil organic matter** (SOM)

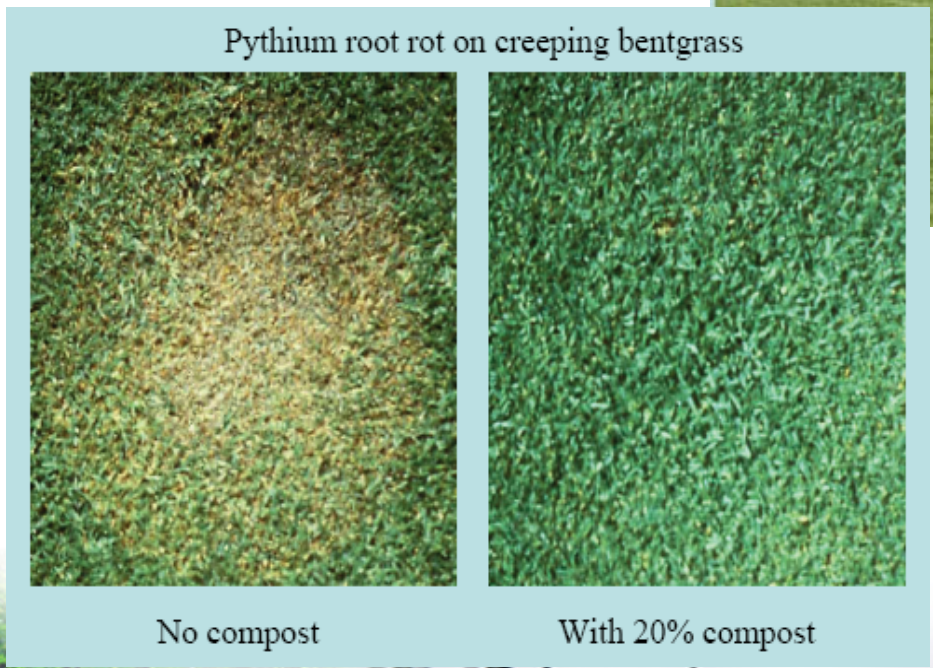
- Should be:
  - **5%-6%** for turfgrass
  - **10%** for planting beds

Did You Know?:

- For every 1% of organic matter, the soil can hold 16,000 gallons of plant-available water per acre of soil down to one foot deep!
  - Most soils average approx. 1%
  - Healthy soils average 5-6%

(5 x 16,000 = **80,000 gallons** water holding capacity per acre ft!)

Top-dressing with compost improves soil health



reduces the need for water, fertilizer, & pesticides

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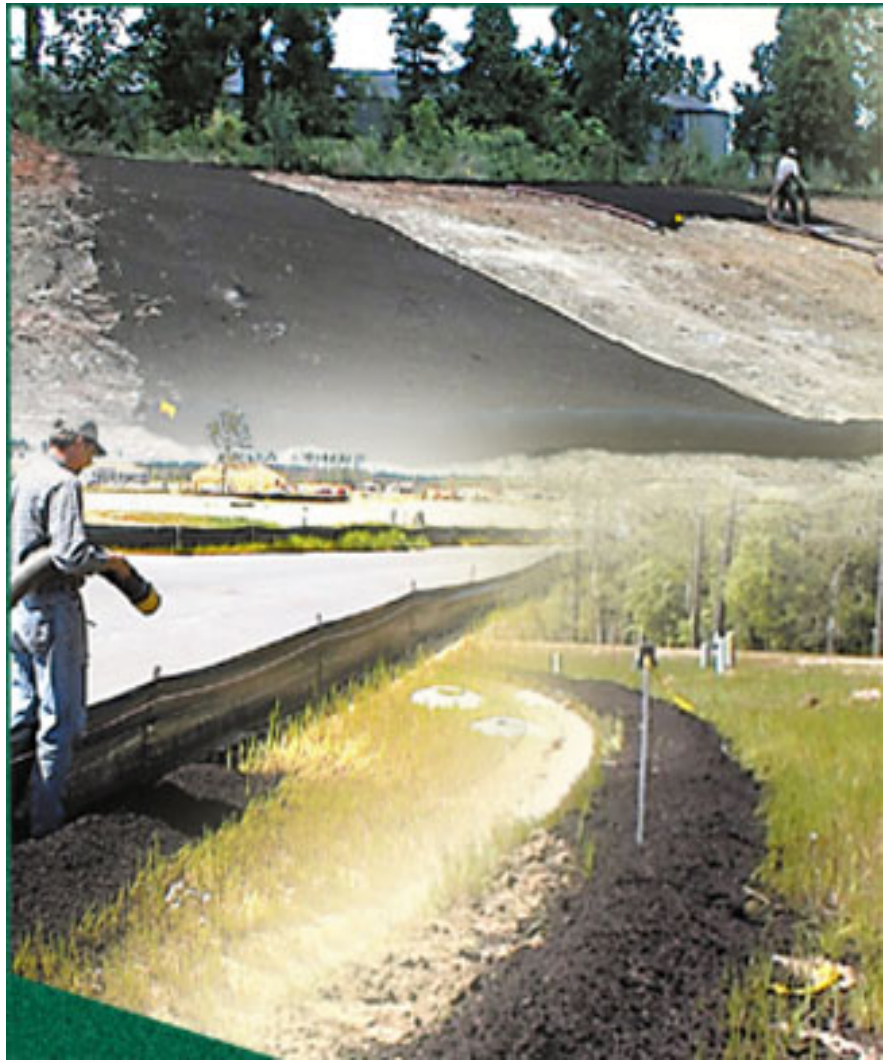
Rebuy:

- **Use compost to minimize or eliminate:**
  - **Soil erosion**
  - **Runoff**
  - **Nonpoint source pollution**
  - **Irrigation**
  - **Fertilizers**
  - **Pesticides**

It's both a recycled & biobased product.



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A Proven Technique

- **Compost blankets**, **berms**, and **filter socks** have been added to the **US EPA** menu of **Best Management Practices** (BMPs) for storm water management - NPDES.

- **State DoT's are specifying compost for roadside erosion control.**

  (http://www.dot.state.tx.us/des/landscape/compost/topsoil.htm)

Compost-Based Stormwater Best Management Practices - MN

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Examples—Texas DOT

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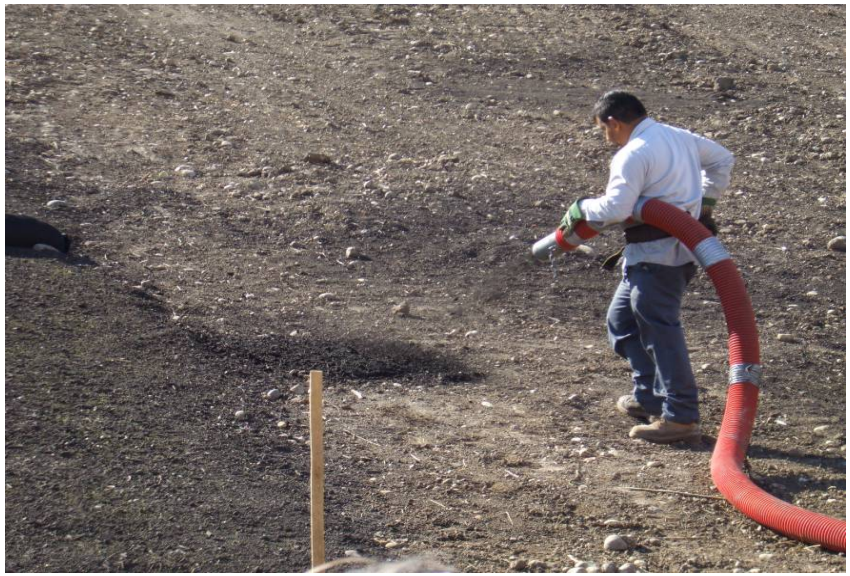
Examples of BMP Installation

- **Compost Berms**
  - Uses a truck with a pneumatic blower
  - Compost and see can be mixed before application
  - The blower nozzle is walked along the slope to form the berm

Examples of BMP Installation

- **Compost Blankets**
  - Uses a truck with a pneumatic blower
  - Compost and see can be mixed before application
  - Measurements can be taken to ensure correct application rate



Examples of BMP Installation

- **Compost Socks**
  - Uses a truck with a pneumatic blower
  - Socks can be stacked to support embankments
  - Socks can be moved, or staked
  - Mesh sock can be degradable
  - At end of use sock can be cut open and compost left on site

Better, Faster, Cheaper Cleanups

- **Compost** provides an **inexpensive** & **straightforward solution** to
  - managing hazardous industrial waste streams &
  - **remediating soils contaminated with toxic organic and inorganic compounds**.

Compost & Mulch

Every scrap of organics generated in the entire U.S could be put to use by the landscape industry alone.

Benefits:

- **Equal or better performance**
- **Material cost savings**
- **Labor cost savings**

- **All of this means money in your pocket.**

GreenScapes Tip Sheets on-line

GreenScapes Tip Sheet

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The economic and environmental cost of waste materials, water, pesticides, fuels, and oils from landscaping and grounds keeping operations can easily be reduced or eliminated with updated landscaping methods. Think how you might be able to incorporate the following tips into your daily operations and use the tables below to help you track your savings:

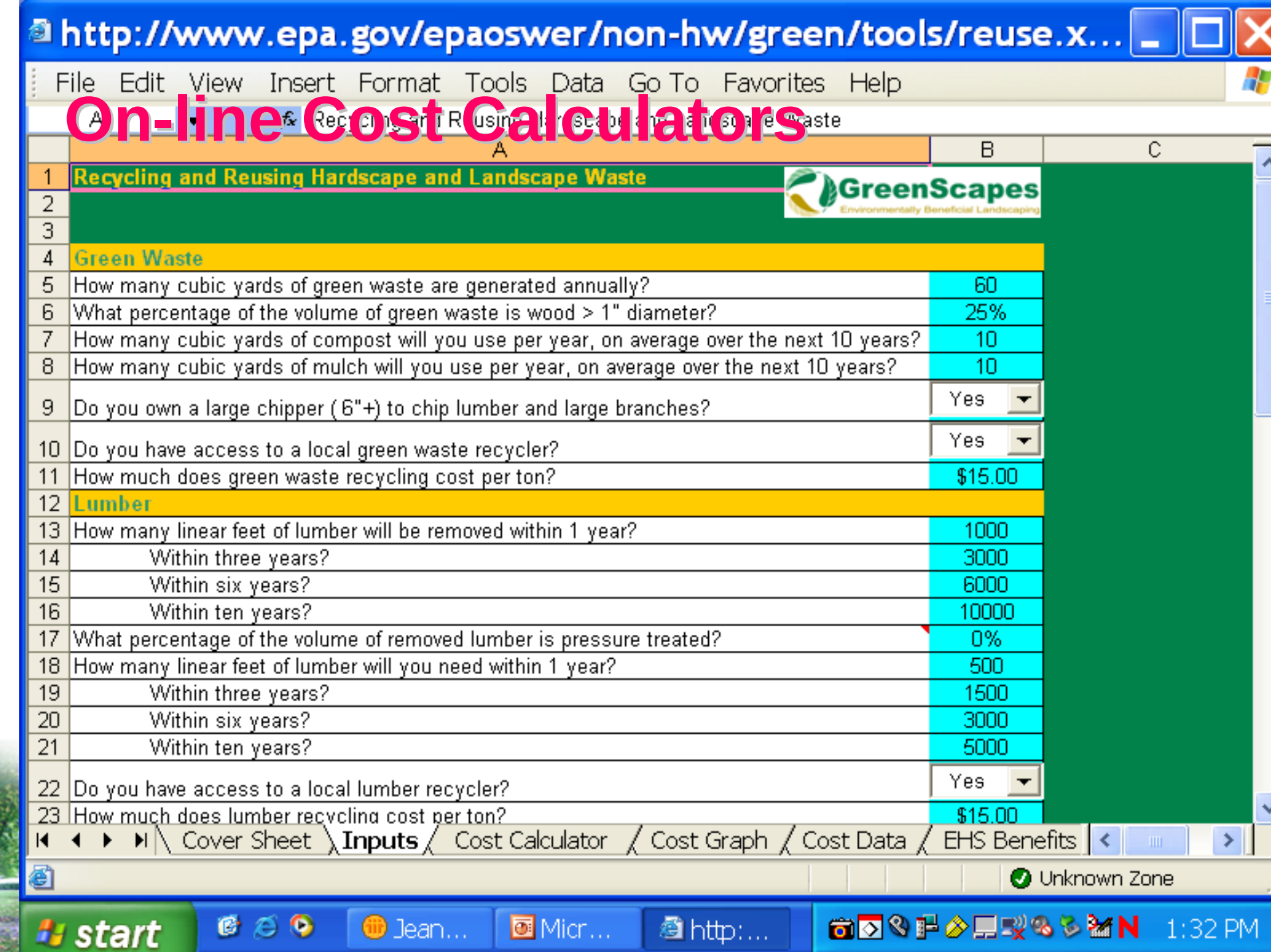
WASTE

Reduce

- Select low maintenance/slow growing plants and grasses.
- Reduce or eliminate plastic silt fencing and substitute with blankets, berms, and filtersocks made of compost for erosion control.
- Switch from pressure-treated wood to plastic lumber for decks, benches, and signs.
- Return wooden pallets and other shipping materials to your supplier whenever possible.
- When replacing an existing hardscape or structure, deconstruct, reuse and recycle all possible materials such as metal, wood, shingles, concrete, and pavement.
- Minimize turf grass and paved areas - keep as much natural area as possible.
- Cluster structures to maximize open space.
- Minimize site and soil disruptions to the maximum extent possible.

Reuse

- Take apart non-returnable wood pallets to reuse the wood (e.g., edging around plant beds) or chip it for use on site for mulch.
- Chip woody waste and tree clippings into mulch for use on-site.
- Donate healthy plants to local nonprofit organizations when reconfiguring or removing trees and shrubs from your landscape.
- Reuse or increase the use and efficiency of existing sites before cutting into new sites.


http://www.epa.gov/epaoswer/non-hw/green/tools/reuse.x...
File Edit View Insert Format Tools Data Go To Favorites Help
On-line Cost Calculators
Recycling and Reusing Hardscape and Landscape Waste
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Green Waste
How many cubic yards of green waste are generated annually? 60
What percentage of the volume of green waste is wood > 1" diameter? 25%
How many cubic yards of compost will you use per year, on average over the next 10 years? 10
How many cubic yards of mulch will you use per year, on average over the next 10 years? 10
Do you own a large chipper (6"+) to chip lumber and large branches? Yes
Do you have access to a local green waste recycler? Yes
How much does green waste recycling cost per ton? $15.00
Lumber
How many linear feet of lumber will be removed within 1 year? 1000
Within three years? 3000
Within six years? 6000
Within ten years? 10000
What percentage of the volume of removed lumber is pressure treated? 0%
How many linear feet of lumber will you need within 1 year? 500
Within three years? 1500
Within six years? 3000
Within ten years? 5000
Do you have access to a local lumber recycler? Yes
How much does lumber recycling cost per ton? $15.00
Cover Sheet
Inputs
Cost Calculator
Cost Graph
Cost Data
EHS Benefits
Unknown Zone
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Coordination with other national efforts:

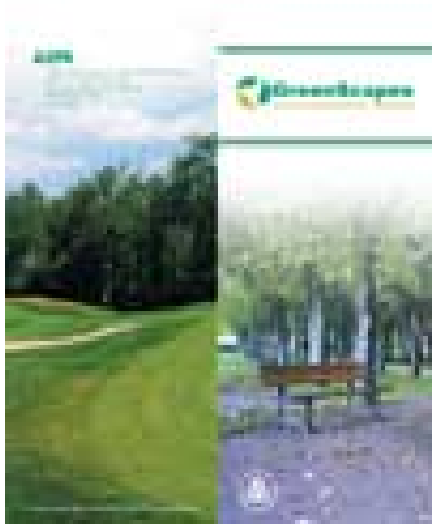
- ***GreenScapes*** and **EPA** is actively involved in the ***Sustainable Sites Initiative***

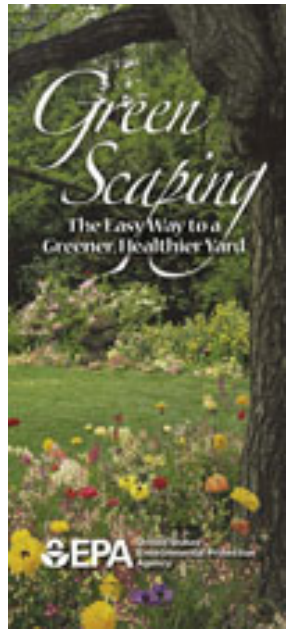
- Many site features are not fully addressed under the current Green Building LEED® standards, but are essential to the sustainability of green spaces

- Establish a standard for sustainable site design, construction, and maintenance with clearly defined metrics

- In late 2007, the USGBC announced they will incorporate SSI into the next version of LEED – a “bookshelf” system

GreenScapes now includes information & recommendations for ***Homeowners***





Commercial business & industry guide

Homeowner guide

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Where We're At Now:

	Generated	Recycled	
1995			
Food waste	14.1 M tons	3.4%	
Yard waste	30.6 M tons	22.9%	
2007			
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Yard waste	32.4 M tons	64.1%	+280%

We all have helped educate and stimulated demand for compost – and that effort continues to grow.

Those making quality products are selling everything they make.

What's Next?

- **Food waste** (a.k.a. food scraps, residuals, trim, …)
- Interest & emphasis on GHG and Climate Change
- We have businesses & corporations nationwide now wanting to compost their yard and **food wastes** instead of landfilling them
- **EPA has developed tools & resources targeting food wastes**
  - Hierarchy & info & resources for all levels, calculator, web page
- Interest in Anaerobic Digestion for material preprocessing and energy
- And there is now a growing assortment of biobased, biodegradable & compostable products hitting the marketplace.
- **But …… there are a couple <u>BIG</u> obstacles:**

Obstacles to continued growth of composting:

- Lack of availability of local composters – especially food waste composters.
- **Food waste - very difficult material to manage**
- Generators and End users unable to easily find the composters & compost that are already out there
- States considering overturning yardwaste landfill bans
- The misperception that if something is biobased or biodegradable, that it's better for the environment.
- Lack of easy to use "grades" of compost to simplify production, marketing, and purchasing of compost (i.e., turf grade, garden grade, erosion control grade, etc) & Lack of quality standards for compost & composters to ensure a quality product and safe operation
  (to support good producers and cull out bad producers)

How to overcome:

- Lack of availability of local composters – especially food waste composters.
  - **The compost & recycling industry needs to work at the state & local level where composting is desired to support this effort.**
  - **Change thinking to product production not waste management/disposal**
  - **List composters on the web (findacomposter.com, uscc)**
  - **More emphasis on waste reduction.**
- The misperception that if something is biodegradable, that it's better for the environment.
  - **Consumer education. Have to ensure that the product actually gets composted and does not end up in the landfill.**
- Lack of easy to use "grades" & quality standards of compost to simplify production, marketing, and purchasing of compost.
  - **The composting industry and possibly regulators need to establish a performance criteria for production and products.**
  - **Stop giving away compost!**

Players

- Generators
- Haulers
- Processors
- Marketers
- Buyers & end users
- Local, State, and Federal gov't
- NGOs – industry associations, environmental groups, schools & universities

No one or two alone can do it – we <u>ALL</u> need to be pitch-in to be successful

We can do it – let's start now!

Thank You!

Questions?

For more info …

www.epa.gov/organicmaterials
www.epa.gov/compost
www.epa.gov/foodscraps
www.epa.gov/greenscapes

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