Lesson 1: Composting in ISWM

Learning Objectives:

- Able to define Integrated Solid Waste Management (ISWM)
- Able to define “compost” and “composting”
- Able to identify role of composting in integrated solid waste management & different scales of composting
- Know the basic environmental benefits of composting

Definition of Composting

- Composting is the *controlled, rapid, high temperature, aerobic biological* decomposition of organic material
- Composting is a biological process that decomposes organic materials
- Composting is performed by micro-organisms

Definition of Compost

- Compost is a stable, humus-like material that is beneficial to soils and plants
- Compost is not a fertilizer; it is a soil amendment
- It's valued for its organic matter content, beneficial micro-organisms, as well as the macro- and micro-nutrients it contains

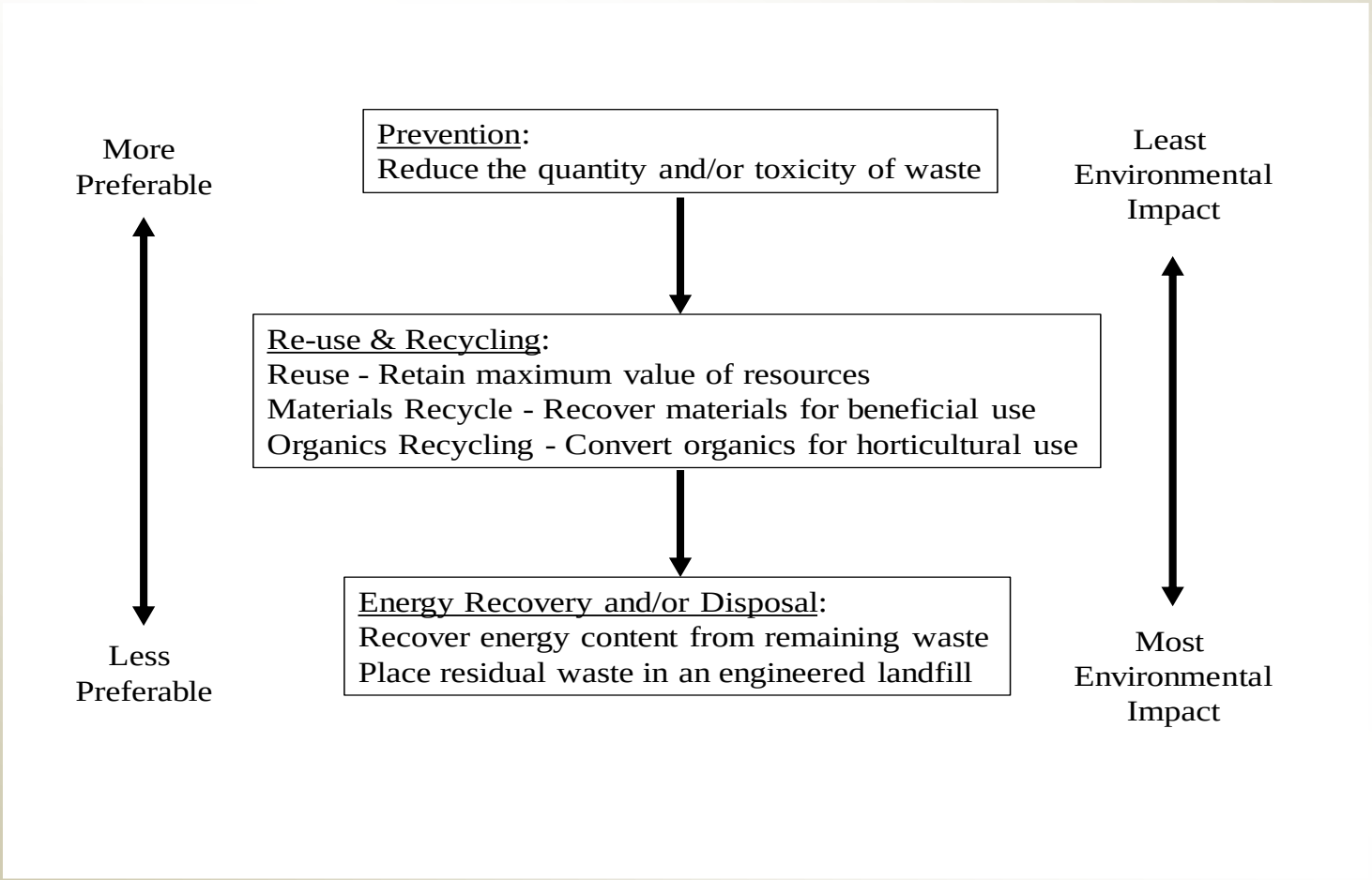
Mulch Is Not Compost

- Mulch is not fully decomposed or stable
- Mulch may not be subjected to time & temperature necessary to kill weed seeds and pathogens
- Mulch can bind up soil nutrients

Integrated Solid Waste Management (ISWM) Defined

"A systematic approach to solid waste management that manages each type of waste, giving priority (in descending order) to prevention, reuse, recycling, energy recovery, and disposal. The goal is to conserve and recover resources and dispose of waste in a manner that protects public health and the environment."

Solid Waste Management Hierarchy



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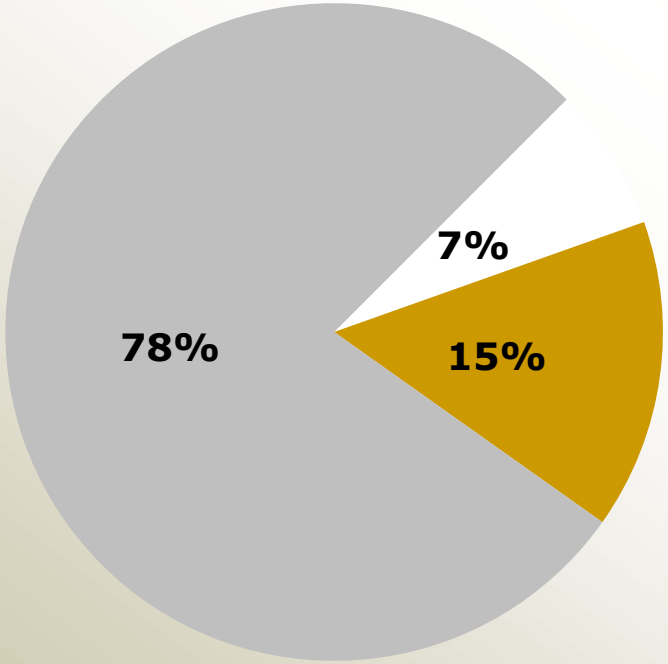
ISWM for Organic Materials

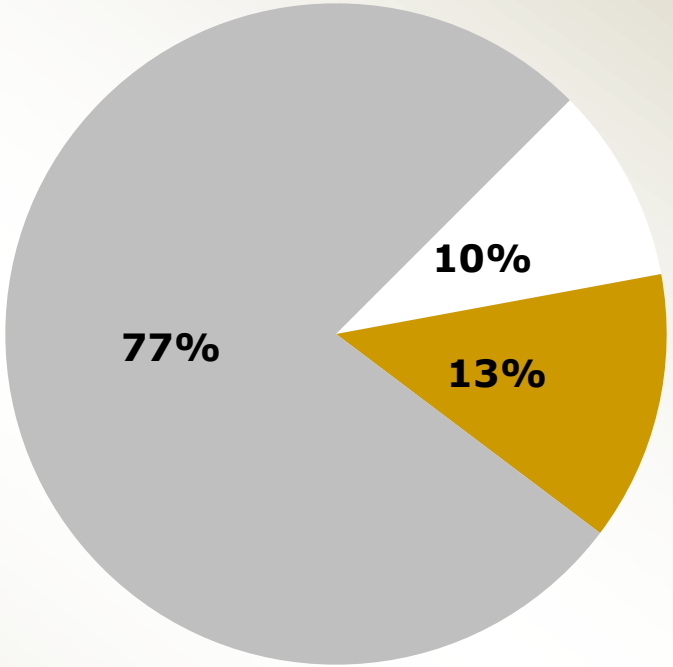
Solid Waste Management Hierarchy	Organic Materials Management Practices
Reduce	• Landscaping to eliminate yard trimmings • No-bag grass mowing • Eliminate food waste
Reuse	• Leftovers to food banks • Leftovers to animal feed
Recycle	• Home composting • Centralized composting • Anaerobic digestion
Energy Recovery	• Anaerobic digestion • Waste to energy • Alternative technologies (pyrolysis & gasification)
Disposal	• Landfill

Organics in Florida's Waste Stream

MSW Generated = 23.9 million tons



MSW Disposed = 17.4 million tons



Food Waste
Yard Waste
Other MSW

FDEP 2006 data

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Reaching 75% Recycling Goal

- Reinstate the yard trash disposal ban
- Exempt biosolids compost from fertilizer registration requirements in Chapter 62-640 distribution and marketing regulations
- Establish a state program that promotes compost utilization to improve soil quality and thereby protect Florida's water quality and conserve water resources
- Ban the disposal of food waste from certain large generators
- Increase organics recycling dramatically – increase yard trash recycling, implement food waste recycling

The Composting vs. Landfill Debate

- Composting Organics:
  - Avoids methane generation
  - Smaller GHG footprint than landfill
  - Cycles organic carbon back into ecosystem
- Landfilling Organics:
  - Produces methane
  - LFG systems do not capture all the methane
  - Loses organic carbon & its ecological benefits

Composting and Environmental Protection

- Benefits of composting & compost use are numerous:
  - Water quality – compost improves soil moisture holding capacity & filters pollutants
  - Nutrient recovery – nutrients are not lost and held in organic matrix
  - Soil quality – pH, CEC, porosity, ecology, water infiltration, etc.

Composting vs. Anaerobic Digestion (AD)

- Different biology, technology, equipment, environmental controls, and end product
- AD produces:
  - Methane that can be recovered for energy/fuel
  - Liquid digestate that can be used to produce liquid fertilizer
  - Solid digestate which can be composted
- Regulatory requirements
  - AD requires solid waste permit
- Economics
  - AD generally has higher capital and operating costs than low and medium technology composting