The Greystone

Student Garden Project

Composting Program

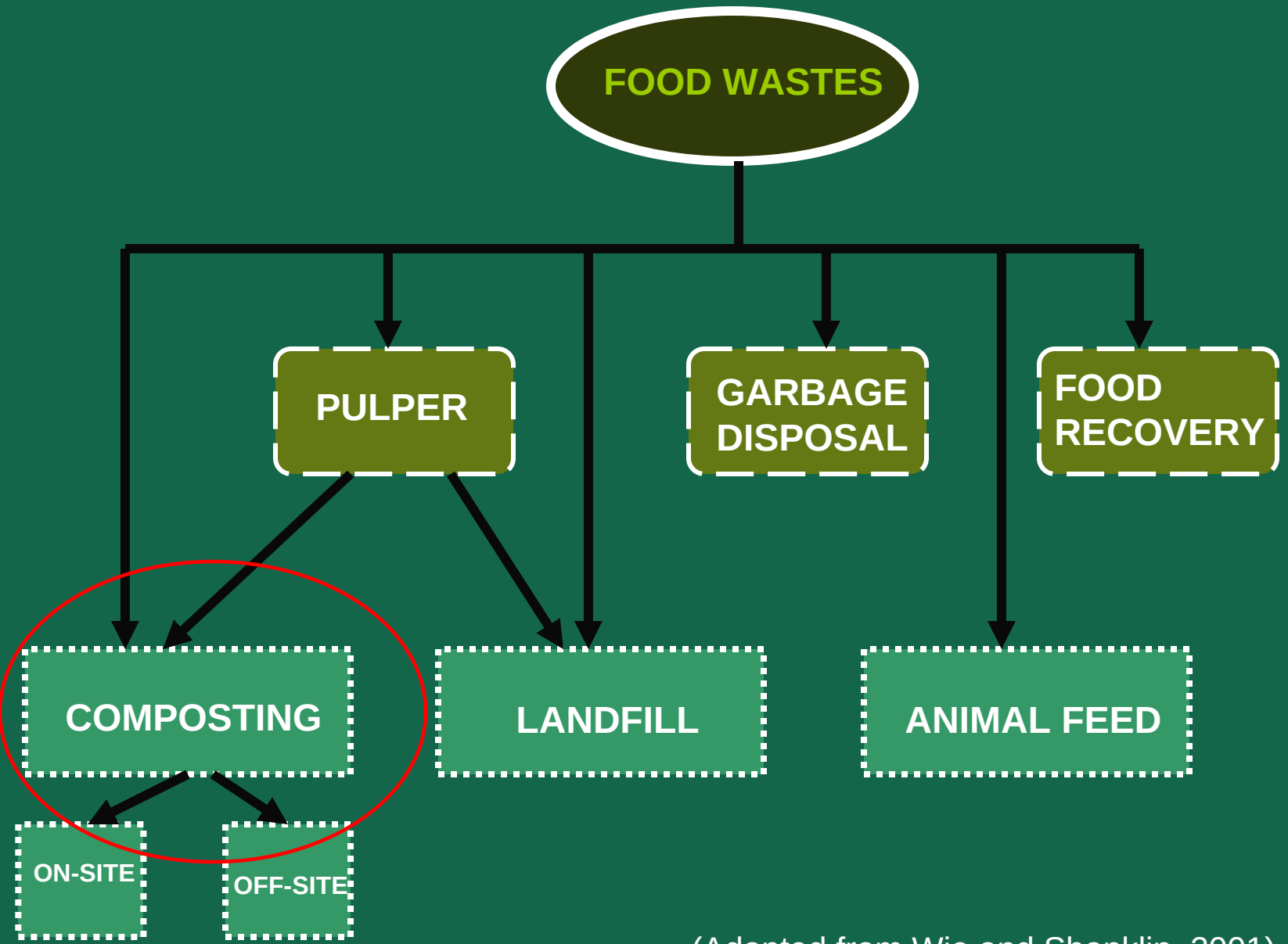
Background

The members of the Greystone Student Garden Project have established a composting program on campus by:

- Learning about methods for waste disposal and composting
- Monitoring and recording the weight of unusable vegetable scraps
- Working closely with the Greystone facilities management team to develop vegetable scrap collection protocols and an off-site compost area
- Being continuously vigilant, and distinguishing between compostable scraps, recyclables, and garbage destined for the landfill

This poster describes why and how we compost at Greystone.

Disposal methods for food wastes



(Adapted from Wie and Shanklin, 2001)

Costs associated with different disposal methods

		Disposal Methods								
Cost		Animal feeding	Composting, on-site	Composting, off-site	Garbage disposal	incineration	Landfill	Pulper	Food Recovery	Recycling
Labor	**Sorting**	X	X	X	X	X		X	X	X
	Operating		X		X			X		
Equipment	**Initial Cost**		X		X			X		
	Depreciation		X		X			X		
	Electricity		X		X			X		
	Water/Sewage				X					
	Maintenance		X		X			X		
Container		X	X	X		X	X	X		X
Storage		X		X		X			X	X
Waste Hauling		X		X		X	X			X
Others					X				X	X

(Adapted from Wie and Shanklin, 2001)

Overview of Composting

- Composting is the managed decomposition of organic residues to produce biologically stable material (Hartman, 1988).

- Composting involves the combination of kitchen scraps with straw or other lignin (cellulose fiber) based materials, and allowing them to be broken down by beneficial microoganisms.

- By composting, we are performing a type of microbial farming –a symbiotic relationship between the culinary farmer and the microorganisms.

How Composting Works

- Plants need nitrogen to grow and produce fruits and vegetables.
- Plant based scraps from the kitchen contain significant quantities of nitrogen, but it is bonded to carbon in a form that is unusable by growing plants.
- Composting converts bound nitrogen into a form that plants can use (for example: nitrates, NO_3^-).
- Microorganisms are responsible for this conversion, by excreting enzymes that breakdown the plant scraps, releasing the usable nitrogen.

(Hartman, 1988)

What does compost do for our garden?

- Reinvigorates soil biology by introducing a diversity of beneficial microorganisms
- Improves plant nutrition
- Improves physical structure of the soil allowing for optimal water retention and root development

(Grubinger, 1999)

How does composting benefit the culinary industry?

- Minimizes costs associated with hauling waste
- Composting necessitates monitoring waste streams, and so serves as a “feed-back loop” informing us on opportunities to further minimize waste
- Provides an example of how culinary professionals can contribute to environmental stewardship

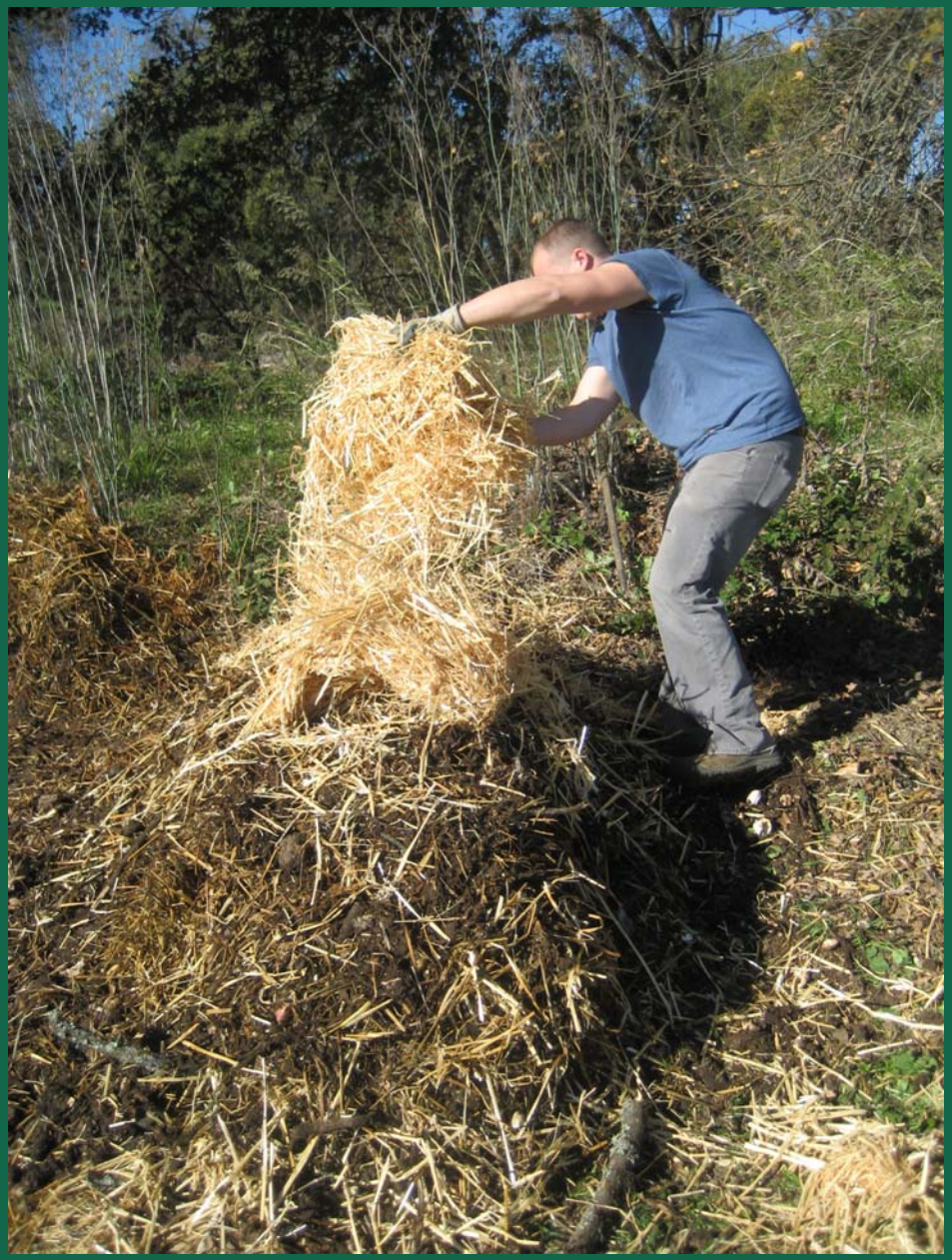
Vegetable scraps are collected in designated bins in the Teaching Kitchen and delivered to the garden every morning.

At the garden, a bed of sticks and straw is prepared. Compostables from the kitchen are placed on top. This ground ventilation allows the compost pile to “breathe,” supporting the growth of beneficial microorganisms that fix nutrients into a form our crops can absorb through their roots.

Compostable kitchen scraps are combined in successive layers with straw at a 1:1 ratio.

The pile is built up with the continuous addition and mixture of straw and compostables to approximate dimensions of 3’x3’x6’.

Once piles are constructed, they are covered with straw to insulate them and trap the heat generated by microorganisms.



Our compost piles reach temperatures of 150˚F.

Covered piles are left to “cook” for 4-5 months. They are uncovered and turned twice during that time to mix, aerate, and facilitate controlled decomposition.

Compost is ready to apply in the garden when it no longer generates heat, smells like soil, and looks like soil.

References and Resources

Hartman HT, Kofranek AM, Rubatzky VE, Flocker WJ (1988) Plant Science; Growth, development, and Utilization of Cultivated Plants, 2nd ed. Prentice Hall, Englewood Cliffs, NJ.

Gajalakshmi S, Abbasi SA (2008) Solid waste management by composting: state of the art. Critical Reviews in Environmental Science and Technology, 38:311-400.

Grubinger VP (1999) Sustainable Vegetable Production From Start–up to Market. Natural Resource Agriculture and Engineering Service, Ithaca NY. Research International (13)17-39.

Hackes BL, Shanklin CW (1999) Factors other than environmental issues influence resource allocation decisions of school foodservice directors. J Am. Diet. Assoc. 99: 944-949.

U.C Davis Project Compost – Student run compost project and clearinghouse for information on composting; http://projectcompost.ucdavis.edu/

Wie S, Shanklin CW (2001) Cost effective disposal methods and assessment of waste generated in foodservice operations. Foodservice Research International, 13:17-39.