

Chapter Six: Organic Waste Reduction

Introduction

Yard debris, garden clippings, fruit, veggies and wood often get sent to the landfill even though they are perhaps the easiest and cheapest materials to divert from the waste stream. This chapter covers options, opportunities and instructions for handling "green" waste.

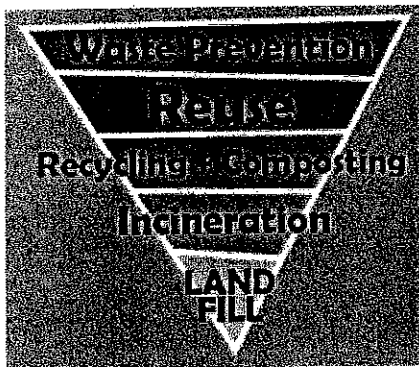
Diverting food from the waste stream significantly reduces the global warming impact from landfills, as decomposing food waste is a major source of the greenhouse gas methane. Diverting pre-consumer food and other organic material from the waste stream significantly reduces the global warming impact from landfills.

Food waste is the third largest component of generated waste by weight. Because of its low composting rate, it is the largest component of discarded waste by weight. The average person generates about 197 pounds of solid waste per year ("Measurement Standards and Reporting Guidelines," National Recycling Coalition, www.nrc-recycle.org).

Green Waste

Biodegradation

In the process of biodegradation, microorganisms break down the products of other living things and incorporate them back into the ecosystem. Biodegradable or bioconvertible



material includes anything that is organic. Plastics are not considered includable, despite industry contention that they are. Most of the organic components of garbage, such as paper and food wastes, can be eliminated through composting. Between 60% and 75% of the solid waste is bioconvertible.

Wastes that are bioconvertible include newspapers, magazines, and wet wastepaper in the kitchen and restaurants. Also included are food waste, cardboard materials, paper office supplies, and leaves, grass, and tree trimmings. The solid fraction of the sewage waste is

also considered available for the bioconversion process, and is often the most costly to dispose of otherwise, usually in a special landfill.

Composting Organic Material

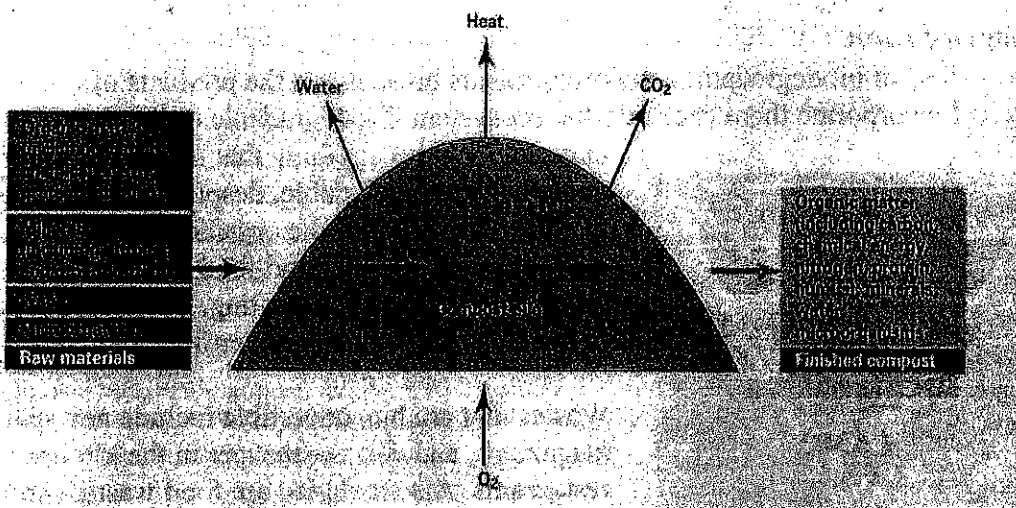
Composting is the aerobic decomposition of biodegradable organic matter, producing compost. The decomposition is performed primarily by facultative and obligate aerobic bacteria, yeasts and fungi, helped in the cooler initial and ending phases by a number of larger organisms, such as ants, nematodes and oligochaete worms.

Composting recycles or "downcycles" organic household and yard waste and manures into an extremely useful humus-like, soil end-product called compost. Ultimately this permits the

return of needed organic matter and nutrients into the food chain. Composting is practiced under virtual government mandate in many western countries, as it can reduce significantly the amount of "green" waste going into burgeoning landfills.

Composting is widely believed to speed up the natural process of decomposition appreciably as a result of the raised temperatures that often accompany it. The elevated heat results from exothermic processes, and the heat in turn reduces the generational time of microorganisms and thereby speeds the energy and nutrient exchanges taking place. It is a very popular misnomer that composting is a "controlled" process; if the right environmental circumstances are present the process virtually runs itself. Hence a popular expression, "compost happens". It is nonetheless very necessary to provide as optimal circumstances as possible for large amounts of organic waste to break down properly.

Composting can be divided into home composting and industrial composting. Essentially the same biological processes are involved in both scales of composting; however techniques and different factors must be taken into account.



Curbside Composting Offered by Waste Haulers

Rogue Disposal & Recycling offers residential yard debris recycling for disposal of grass, leaves, clippings, or bushes as garbage. Households signing up for service receive a 95-gallon roll-cart with a green lid, which are emptied every two weeks. Homes and businesses have the option of using the yard debris recycling depot at the Rogue Disposal Transfer Station to save money.

Acceptable Materials

If it grows, it goes! Any organic debris from your yard or garden is acceptable, including grass, leaves, clippings and garden materials. Maximum branch size is 4 inches in diameter with a maximum length of 4 feet.

Not Acceptable in Composting Carts:

- Plastic Bags
- Dirt
- Manure
- Processed wood waste
- Mixed Loads
- Rock
- Sod
- Trash of any kind!



Ashland Sanitary & Recycling – In addition to yard and garden debris, residential customers can put *uncooked* vegetable and fruit trimmings (pre-consumer only), paper coffee filters, coffee grinds, tea bags and floral clippings in a 95-gallon roll-cart for customers inside the urban growth boundary for their yard debris. The cart is picked up every other week on the regular collection day. *Only uncooked, pre-consumer* vegetables and fruit trimmings, coffee grinds, tea bags, and floral clippings are accepted.

Southern Oregon Sanitation does not currently offer separate yard debris containers.

Home Composting

Composting takes advantage of nature's natural decomposition system, in which organisms feed on and break down organic materials. As materials decompose, they generate heat. Then, other organisms begin to participate. Bacteria start the process. Fungi and protozoa follow. Finally centipedes, millipedes, beetles and worms finish the job. These beneficial organisms thrive on a 4-ingredient recipe:

1. **Greens (one part)** - fresh grass clippings, green leaves, plant stalks, hedge trimmings, vegetable and fruit scraps, coffee filters and grinds and tea bags
2. **Browns (two parts)** - old potting soil, dried grass, leaves and twigs, shredded newspaper, straw, wood chips
3. **Water** - to keep the pile as damp as a wrung-out sponge
4. **Air** - provided through regularly turning the pile to allow all of the parts to remain well aerated.

The speed at which a pile breaks down depends on the health of the organisms. The more contact the greens and browns have with the water and air, the hotter the pile will get and the faster it will decompose.

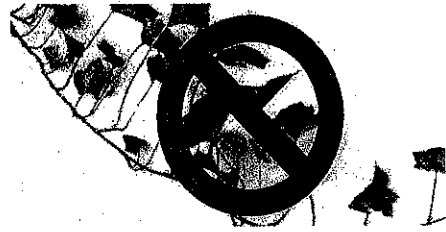
The approaches to composting vary. Some people simply place the materials in a pile or container, regularly watering and turning the contents. This method will produce a harvest about once or twice a year. Others use the hot compost method, where green and brown materials are layered and carefully balanced, and the pile frequently turned. Some home composters successfully harvest from these "hot" compost piles in as little as six weeks.

Which ever approach you choose, making sure greens and browns are chopped into small parts so that they have more surface area to have contact with the water and air will speed decomposition.

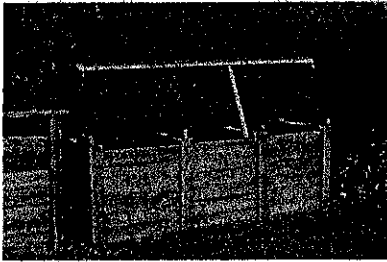
Materials to avoid

Some materials invite vermin, propagate weeds or disease, or produce an odor. These problems can be minimized by avoiding:

- Diseased plants
- Weeds and seed heads
- Invasive plants like ivy or morning glory
- Pet waste
- Bread and grains
- Meat and dairy
- Grease



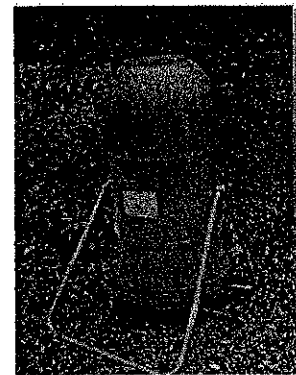
Compost containers



While some people choose to use very elaborate composting containers, compost bins can also be simple and inexpensive. Turning units allow waste to be conveniently mixed and aerated regularly. They usually have three partitions: one side for greens, one for browns and a middle bin, where the two are layered.

Another type of bin that is growing in popularity is the tumbler. Often made from old barrels, these units are mounted on turning mechanisms used to rotate and mix the material inside

Despite the many, and often expensive, options for containing compost piles, many people simply use chicken wire. Others use no container at all, opting instead to (literally!) pile their compostable materials.



Recipes for Composting

Ingredients:

- Green yard waste: grass clippings and weeds.
- Brown yard waste: leaves, small brush and twigs.
- Worms (they will find the pile naturally, or you can add them)



Directions:

- In a heap, layer your yard waste as it accumulates. For faster composting, chip it up first.
- Water so compost is kept as moist as a wrung-out sponge.
- In a year to 18 months, the material at the bottom and center of the pile will be dark, crumbly compost. Sift, and use the un-composted material to start a new batch.

Fast Compost

Ingredients: green and brown yard waste, water as needed.

Directions:

- Mix one part green yard waste with two parts brown to form a pile (an average size is 4' x 4' x 4'). For fast composting, chop it up first with a hoe or lawn mower.
- Mix in one inch of soil.
- Keep the pile as moist as a wrung-out sponge.
- Turn the pile every week to let air in.
- Finished compost will take between 4 weeks and 1 year, depending on how often you turn it and how well you maintain the moisture of the pile.

Uses for Compost

- **As a soil amendment:** Mix two to five inches of compost into vegetable and flower gardens each year before planting.
- **As a potting mixture:** Add one part compost to two parts commercial potting soil, or make your own mixture by using equal parts of compost and sand or perlite.
- **As a mulch:** Spread an inch or two of compost around annual flowers and vegetables, and up to six inches around trees and shrubs.
- **Top-dressing for lawns:** Top-dressing turf areas with compost is recommended to provide a slow release of nitrogen. Mix finely sifted compost with sand and sprinkle evenly over lawn. Using compost also will improve the condition of your soil and allow for better water retention, which will allow you to use less water.

Source: Metro's "It's easy to make your own compost"

Troubleshooting Compost Piles

Problems that arise in home compost piles often result from an imbalance in the four essential ingredients. This chart summarizes the most common composting problems and solutions.

Symptoms	Problems	Solutions
The heap is wet and smells like rotten eggs	Not enough air; pile too wet	Turn it; add coarse, dry wastes such as straw or corn stalks
The center is dry and contains tough, woody wastes	Not enough water in pile. Too woody.	Turn and moisten; add fresh green wastes; chop or shred
The heap is damp and warm right in the middle, but nowhere else.	Pile is too small, or too dry	Collect more material and mix into a new pile; moisten
The heap is damp and sweet-smelling, but will not heat up	Lack of nitrogen in pile. Compost is done	Mix in fresh grass clippings or Nitrogen fertilizer.

Compost for Sale

Rogue Disposal & Recycling, Inc., and its affiliate Oakleaf Enterprises LLC, make compost from rich materials collected here Jackson County through curbside collection programs. This nutrient-rich, all-organic compost is certified by the Organic Materials Review Institute (OMRI) and earned the U.S. Compost Council's Seal of Testing Assurance. The compost's internal temperature is brought to between 140° and 150° for at least 15 days, turning it to ensure all material is exposed to this temperature. This process kills all pathogens and weed seeds, ensuring a premium product. Oakleaf is composted and cured for 12 to 18 months and is turned at least three times.

Oakleaf Compost is available in bulk or by the bag for delivery or pick-up at the Rogue Disposal transfer station and Valley View transfer station. Each bag weighs about 60 pounds and is 1.5 cubic feet of material.

Oakleaf Enterprises has partnered with Phoenix Organics to market its compost. Phoenix Organics, a supplier of eco-friendly building materials and organic farming supplies, sells the product under the label of "Vital Earth's Organic Compost." Phoenix Organics is located at 4543 S. Pacific Highway in Phoenix; 541-535-1134; www.phoenixorganics.com.

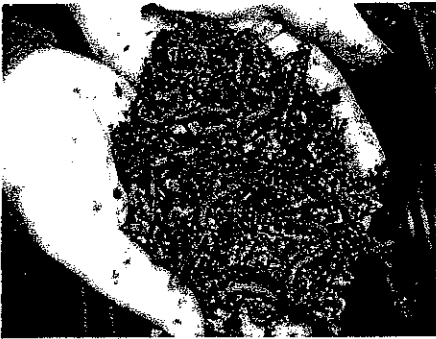
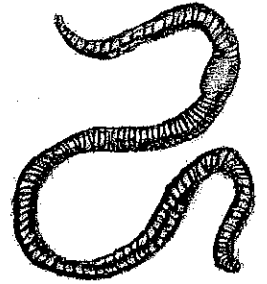
Free Fall Leaf Recycling in Jackson County

Each fall Ashland Sanitary & Recycling offers Free Fall Leaf Recycling. In 2007, the program diverted over 99,000 pounds of leaves from the landfill! For upcoming dates, visit www.ashlandsanitary.com. Rogue Disposal contracts with the City of Medford to provide free curbside collection of leaves in November and December. 1035 tons were collected through this program in 2007. Several cities in Jackson County also offer programs to manage leaves in the fall.

Composting With Worms

Why Compost With Worms?

Worm composting is a method for recycling food waste into a rich, dark, earth-smelling soil conditioner. The great advantage of worm composting is that it can be done indoors and outdoors, thus allowing year round composting. It also provides apartment dwellers with a means of composting. In a nutshell, worm compost is made in a container filled with moistened bedding and redworms. Add your food waste for a period of time, and the worms and micro-organisms will eventually convert the entire contents into rich compost.



The following information is based on the experiences of a network of worm composters linked to City Farmer, Vancouver, and the excellent and practical book: *Worms Eat My Garbage* by Mary Appelhof.

This brief introduction to worm composting is only a basic guide, and while we have tried to include all the necessary information to get you and your worms started, we recommend that you also read the book - it is full of useful and fascinating details about this

process.

What Do I Need To Get Started?

A. Container

Containers are usually plastic or wood. Either build or buy, or use your imagination and recycle something like an old dresser drawer, trunk, or discarded barrel. We prefer wood because it is more absorbent and a better insulator for the worms. We use plastic containers but find that the compost tends to get quite wet. Experiment and find out what works for you and your worms.

Guide to Size Of Container

In *Worms Eat My Garbage*, Mary Appelhof suggests weighing your household food waste for one week (in pounds), and then provide one square foot of surface area per pound. The container depth should be between eight and twelve inches. Options to one large (and heavy) box are a number of smaller containers for easier lifting and moving and more choice of location. The book illustrates a variety of containers.

Depending on the size of the container, drill 8 to 12 holes (1/4 - 1/2 inches) in the bottom for aeration and drainage. A plastic bin may need more drainage - if contents get too wet, drill more holes. Raise the bin on bricks or wooden blocks, and place a tray underneath to capture excess liquid which can be used as liquid plant fertilizer.

The bin needs a cover to conserve moisture and provide darkness for the worms. If the bin is indoors, a sheet of dark plastic or burlap sacking placed loosely on top of the bedding is sufficient as a cover. For outdoor bins, a solid lid is preferable, to keep out unwanted

scavengers and rain. Like us, worms need air to live, so be sure to have your bin sufficiently ventilated.

B. Bedding

It is necessary to provide a damp bedding for the worms to live in, and to bury food waste in. Suitable bedding materials are shredded newspaper and cardboard, shredded fall leaves, chopped up straw and other dead plants, seaweed, sawdust, compost and aged manure. Try to vary the bedding in the bin as much as possible, to provide more nutrients for the worms, and to create a richer compost. Add a couple of handfuls of sand or soil to provide necessary grit for the worm's digestion of food.

It is very important to moisten the dry bedding materials before putting them in the bin, so that the overall moisture level is like a wrung-out sponge. The bin should be about three-quarters full of moistened bedding. Lift the bedding gently to create air spaces which help to control odors, and give freer movement to the worms.

C. Worms

The two types of earthworm best suited to worm composting are the redworms: *Eisenia foetida* (commonly known as red wiggler, brandling, or manure worm) and *Lumbricus rubellus*. They are often found in aged manure and compost heaps. Please do not use dew-worms (large size worms found in soil and compost) as they are not likely to survive.

How Many Worms Do I Need?

Mary Appelhof suggests that the correct ratio of worms to food waste should be: for one pound per day of food waste, use two pounds of worms (roughly 2000). If you are unable to get this many worms to start with, reduce the amount of food waste accordingly while the population steadily increases.

What Do I Feed My Worms?

You can compost food scraps such as fruit and vegetable peels, pulverized egg shells, tea bags, corn meal and coffee grounds. It is advisable not to compost meats, dairy products, oily foods, and grains because of problems with smells, flies, and rodents. No glass, plastic or tin foil, please.

To avoid fly and smell problems, always bury the food waste by pulling aside some of the bedding, dumping the waste, and then covering it up with the bedding again. Bury successive loads in different locations in the bin.



Where Should I Locate My Worm Bin?

Worm bins can be used indoors all year round, and outdoors during the milder months. The advantage of mobile bins is that they can be moved when weather conditions change. Indoors, basements are excellent locations (warm, dark and dry), but any spare space can be utilized, so long as temperatures are between 40-80 degrees F. We know dedicated worm composters who have convenient kitchen counter worm bins. Outdoors, bins can be kept in sheds and garages, on patios and balconies, or in the yard. They should be kept out of hot sun and heavy

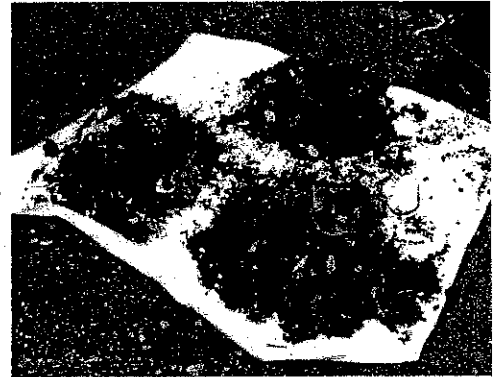
rain. If temperatures drop below 40 degrees F., bins should either be moved indoors, or well insulated outdoors.

How Do I Maintain My Bin?

If you have the correct ratio of surface area to worms to food scraps, there is little to do, other than adding food, until about two and a half months have passed. By then, there should be little or no original bedding visible in the bin, and the contents will be brown and earthy looking worm castings. The contents will have substantially broken down.

It is important to separate the worms from the finished compost, otherwise the worms will begin to die. There are several ways to do this and you can discover which is best for you. The quickest is to simply move the finished compost over to one side of the bin, place new bedding in the space created, and put food waste in the new bedding. The worms will gradually move over and the finished compost can be skimmed off as needed.

If you have the time or want to use all the compost, you can dump the entire contents of the bin onto a large plastic sheet and separate the worms manually. Most children love to help with this process and you can turn it into a fun lesson about worms for them. Watch out for the tiny, lemon-shaped worm cocoons which contain between two and twenty baby worms! By separating the worms from the compost, you save more worms for your next bin. Mix a little of the finished compost in with the new bedding of the next bin, and store the rest in plastic bags for use as required.



Where Do I Use My Compost?

The compost can be mixed with potting soil and used for houseplants and patio containers. It is an excellent mulch (spread in a layer on top of the soil) for the garden or potted plants. If it is screened, it can be added for potting mixes for seedlings, and finely sprinkled on a lawn as a fertilizer. It can also be used directly in the garden, either dug into the soil or used as a mulch.

Common Problems and Solutions

The most common problem is unpleasant, strong odors which are caused by a lack of oxygen in the compost. This is due to food waste overload, and the bin contents become too wet. The solution is to stop adding food waste and water until the worms and micro-organisms have broken down the food, and to gently stir up the entire contents to allow more air in. Also, check the drainage holes to make sure they are not blocked. Drill more holes if necessary. Worms will drown if their surroundings become too wet. However, worms need moisture to live, so make sure your bed stays moist—not wet or dry—moist.

Worms have been known to crawl out of the bedding and onto the sides and lid if conditions are wrong for them. If the moisture level seems alright, the bedding may be too acidic. This can happen if you add a lot of citrus peels and other acidic foods. Adjust by adding a little garden lime and cutting down on acidic wastes.

Fruit flies can be an occasional nuisance. Discourage them by always burying the food waste with dry materials. Keep a piece of cheese cloth, a piece of old carpet, or sacking over the lid of the bin so flies cannot enter. If flies are still persistent, move the bin to a location where flies will not be bothersome. A few friendly spiders nearby will help control fly problems!

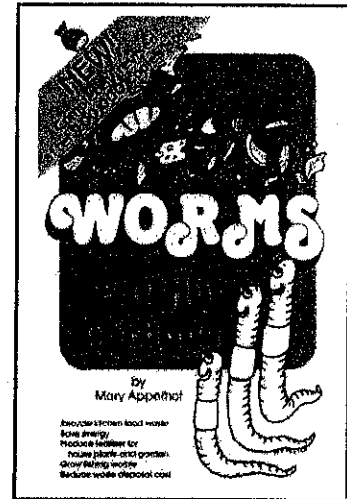
The Final Word

Taking worms out of their natural environment and placing them in containers creates a human responsibility. They are living creatures with their own unique needs, so it is important to create and maintain a healthy habitat for them to do their work. If you supply the right ingredients and care, your worms will thrive and make compost for you. Happy and successful composting!

Worm Resources

“Worms Eat My Garbage” by Mary Applehof
Published by Flower Press; ISBN # is 0-942256-03-4.

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Food Diversion

Each year, more than 720,000 Oregonians use the services of food banks. Much of the food discarded by restaurants and grocery stores is healthy, nutritious and safe to eat. Many organizations accept deliveries or pick up donations on an on-call basis or regular pre-arranged schedule. Food banks and hunger relief agencies maintain well-defined protocols for ensuring the safe and efficient collection and distribution of donated food. Donors who provide food in good faith are protected by both state and federal Good Samaritan laws that were designed both to encourage donation of needed foods and to protect donors.

Food Diversion Organizations

Several organizations in Jackson County that offer food collection services are included in the Recycling Directory at www.RogueSMART.org

ACCESS, Inc.

ACCESS, Inc., based in Medford, offers a wide variety of programs to assist and support low-income individuals and families throughout Jackson County. Each year, ACCESS Nutrition Programs provide food for more than 200,000 hungry individuals with more than 37,000 emergency food boxes and 4,200 senior food boxes. www.access-inc.org; 541.779.6691

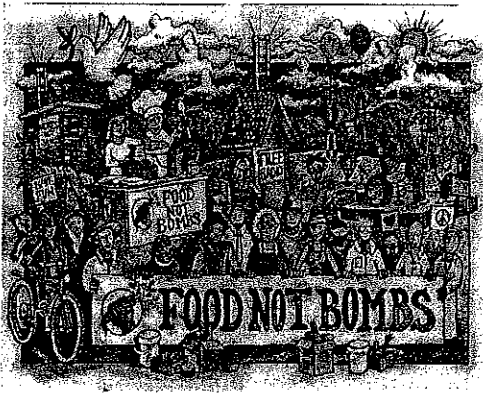
Two of the programs that help ACCESS to provide food are:

Fresh Alliance – The collection of meat, milk, dairy, and other products from community grocery stores including Fred Meyer, Albertson's and Ray's Food Centers.

Food Rescue – The collection and distribution of high quality, nutritious food, from restaurants and institutions, that has been prepared but not served and would otherwise be discarded

Food Not Bombs

This organization recovers healthy, nutritious, vegetarian food that would have been otherwise discarded. Groups of people then cook and serve it to people in immediate need.



Food Not Bombs is an alternative food distribution organization, intent on building sustainable community food sharing programs. Food Not Bombs is a de-centralized, all-volunteer organization dedicated to nonviolent social change. Groups have been active in Jackson County, and throughout Oregon, since the early 1980s. Food not Bombs continues to provide meals to those who need them, and is an example of how grassroots groups can affect positive change while reducing waste. www.foodnotbombs.net

Wood Diversion

Wood is another easy material to direct away from the landfill for better use:

- Biomass One in White City accepts wood waste for a fee, which will be turned into either energy or mulch
- Hilton Fuel accepts free deliveries of wood on Blackwell Road, Central Point where it is mulched
- CJW Pallets will refurbish pallets in good condition for reuse
- See the Jackson County Recycling Directory for more details, www.RogueSMART.org

