

Composting

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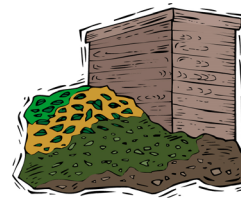
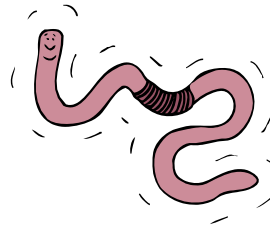
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What is it?

Composting is returning wastes to the earth. It is the managed rotting of organic waste and a natural process that turns organic material into a dark nutrient-rich substance. In the lower-48, it is a **very popular** method now. Of course-- our Native cultures were using composting a long time ago!

Why compost?

Good for plants

Adding compost to your garden will make your plants grow bigger and better because it contains many nutrients. Adding compost to your soil also increases its water holding capacity.

Reduces garbage that goes to the dump

Composting saves space in your dump/landfill! It can also save you money if you pay for trash removal because it reduces your amount of trash. Composting organic material can also reduce potential odors and pest problems at the dump/landfill. Any compost produced can be used to

cover trash at the dump/landfill. Covering trash can reduce odors, vectors, litter, and can make your dump look nicer!

Reduces greenhouse gas emissions

When sealed in landfills without oxygen, organic materials release methane, a potent heat-trapping gas, as they decompose. Methane is one of several greenhouse gases that contribute to global climate change.



What you can and cannot compost

What you CAN compost

There are two categories of organic material ("greens" and "browns") that you can compost. Examples are listed below.

Greens

- ❖ Kitchen waste: vegetable/fruit peelings and scraps, spoiled food, coffee grounds (with filter), tea bags, crushed egg shells, breads; cooked pasta and rice
- ❖ Green leaves
- ❖ Grass
- ❖ Farm-type Manure (rabbits, chickens, duck, geese, etc.)
- ❖ Weeds, flowers, garden waste (only use weeds before they go to seed)
- ❖ Seaweed or kelp
- ❖ Fish waste

Browns

- ❖ Dry leaves
- ❖ Bark chips
- ❖ Straw
- ❖ Prunings and cuttings
- ❖ Evergreen needles
- ❖ Dryer/vacuum lint
- ❖ Hair
- ❖ Cardboard/paper
- ❖ Sawdust

What you CAN'T compost

There are some things that shouldn't put into compost piles because of things like toxins, plant or human diseases, or weed troubles. Avoid composting the following materials or compost them separately from compost that will be used for food production:

- ❖ Meat, bones, fatty food wastes such as butter, cheese, oil and salad dressing
- ❖ Dairy products

- ❖ Weeds with mature seeds, destructive weeds (morning glory, sheep sorrel, ivy, etc.) (may re-sprout in your compost pile!)
- ❖ Human waste (can contain disease organisms)
- ❖ Pet waste (separate non-food compost is possible, but see note at end of document)
- ❖ Walnut shells
- ❖ Plants or grass clippings that were treated with chemicals
- ❖ Chemically treated wood products (may contain arsenic!)
- ❖ Diseased or insect-infected plants
- ❖ Charcoal or coal ashes

Basics of composting

Composting is really very simple, and you can put as much work (or not) into it as you want to. Here are the basic requirements for composting:

Composting environment

Compost is made by billions of microbes (tiny bugs, fungi, etc.) that digest the food you give to them. Worms, insects, and their relatives will often also help out the microbes. Like people, these living things need air, water, shelter and food. If you give them these basic things, they will happily turn your organic waste into compost.



Food

As mentioned above, there are two major categories of food that composting microbes need.

'**Greens**' are fresh (and often green) and examples are given above in the "what you can compost" section. Greens have a higher amount of nitrogen in them, compared to browns.



'**Browns**' are dry and dead plant materials and examples are given above in the "what you can't compost" section. Browns have a higher amount of carbon in them.



Composting requires a balance of nitrogen and carbon (i.e. of greens and browns) and the general rule is, **1 part greens to 3 parts browns**. This means you need to add three times the amount of browns than greens to your compost pile.

Air

Composting microbes are *aerobic* -- they don't work well unless they are provided with air. Without air, *anaerobic* (non-air needing) microbes take over. Anaerobic microbes do decompose your organic waste but very slowly and often with a rotting garbage smell! So it's important to make a lot of passageways for air in your compost pile. To make sure you have plenty of air in your compost pile **turn** the pile. Turning the pile means



completely breaking it apart with a shovel or other tool you have around and then piling it back together in a more 'fluffed-up' condition.

Water

Ideally, your pile should be as moist as a wrung-out sponge for the microbes to be happy. If your pile is drier than this, the composting process will be very slow. If your pile is a lot wetter, the organics will be so heavy that they will tend to mat down and prevent air from getting into the pile, which will again slow the composting process down (and might even create anaerobic odor problems!). If it rains a lot in your community, you might want to use a tarp to help keep the rain off the pile to prevent soggy.



OK - so now I know the basics. How do I actually start composting?

Now that you've got your ingredients for composting, it's time to take action! There's a lot of great information out there about how to compost. Check out any of these websites for step-by-step tutorials on how to compost:

http://www.compost-info-guide.com/beginner_guide.htm

<https://www.almanac.com/how-compost-guide-composting-home>

Composting in Alaska

Note that composting in Alaska is going to be a little different from composting in many places in the lower-48, due to the colder temperatures. The composting process will probably take more time due to the colder temperatures and may temporarily stop in the winter during freeze-up (but don't worry - it will start back up when springtime thaw comes). Two things in particular are important when composting in Alaska: the **location** and **size** of your composting pile.

Location - where to place your compost pile

Choose a convenient place to put your compost pile. Ideally it should be located on level ground. It should also be at a place that has access to a water supply. Microbes like heat, and since our winters are pretty cold, select a spot that receives **maximum heat and sunlight**. Don't put your compost pile right up against a wood building or tree because the wood will eventually decay.



Size of your composting system

The size of your compost pile needs to be **big enough to hold heat in** but still small enough to be able to turn to let air in. You can choose to build a bin (or buy a bin) to compost in, or just build your pile on the ground. For information about composting in a bin, see our Composting equipment section below. If you choose to compost without a bin and just build

your pile on the ground, a good size for a compost pile is 3 feet long, 3 feet wide, and 3 feet high.

Composting equipment

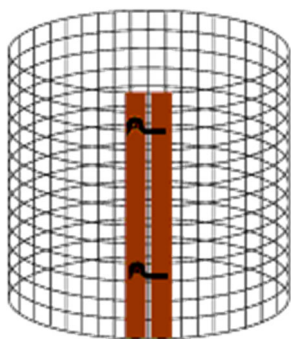
As mentioned above, you can choose to compost in an open pile on the ground or in a bin. Composting in bins can save space, speed up decomposition and can keep your composting area neat. Bins can be very simple structures but need to be designed for a few things such as airflow etc. You can build your own bin or purchase one.

Build your own bin

To build your own bin, you can use any material that is convenient - wooden pallets, plywood, bricks, wire cage etc. Here are some examples of home-built composting bins and websites which describe how to build them:

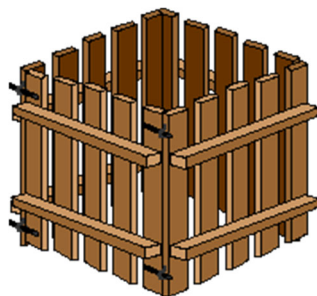
1) Wire Mesh Bin

<https://greenandgrumpy.com/lazy-composting-with-hardware-cloth-bins/>



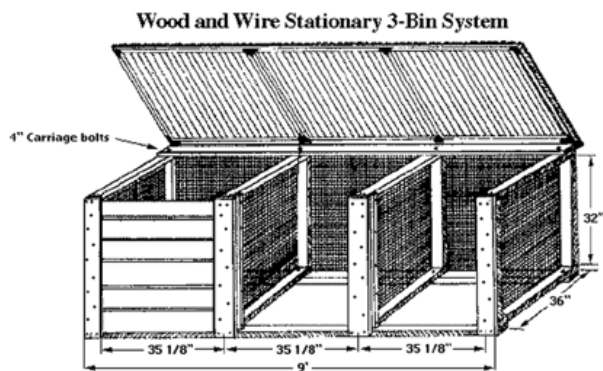
2) Wood Pallet Bin

https://www.youtube.com/watch?v=fW_DVNUt7ms



3) Three-Bin Wood Composter

<https://thehouseandhomestead.com/how-to-build-a-3-bin-composter/>



Purchase a bin

Most commercial bins that you can purchase are made of plastic and are more expensive than do-it-yourself bins. The plastic does help to insulate the compost and allow decomposition later into the cold season, but not enough to really make them that much better than a homemade bin in terms of performance. However, if you don't have the resources to build your own bin, there are many different types of bins you can purchase.



Photo source: Alaska Mill and Feed



Where to purchase composting bins

Alaska Mill and Feed sells small worm composting units for composting kitchen scraps and urban compost tumblers ideal for yard, garden and kitchen wastes.

Contact: (907) 276-6016, 1501 E. 1st Avenue Anchorage, AK 99501

Email: info@alaskamillandfeed.com Web: <https://www.alaskamillandfeed.com/>

Acme Worm Farm Phone: 520-750-8056 <http://www.acmewormfarm.com/wormbins.html>

Composting resources in Alaska

UAF/USDA Cooperative Extension Service

The Cooperative Extension has some great composting publications and a "how to compost video." They also offer composting workshops from time to time. Contact Julie Riley at 786-6306 To view a list of their composting publications, click on the following link <https://www.uaf.edu/ces/pubs/catalog/> and search keyword "compost".

Alaskan Growers School

A new agriculture program out of UAF's Cooperative Extension Service with support from the USDA starts April 20, 2011. The Alaskan Growers School is a unique opportunity intended for Alaska Natives living in remote villages to gain the knowledge and skills to grow and raise food to complement a traditional, subsistence lifestyle. Although the program is open to anyone in Alaska, students from the Tanana Chiefs Conference region will be given priority for enrolling in the course as they are a partner on the grant. After students complete the course, they will gain the knowledge and skills necessary to grow enough food for themselves and 10 other families! Students will also gain a variety of other skills including raising bees, livestock, chickens, starting a business, marketing wild teas and other forest products, and much more! For more information or to apply, please follow this link: <https://uaf.edu/ces/agriculture/ags/>

Mat-Su college

The Mat-Su college in Palmer Alaska offers a course on composting from time to time. <https://matsu.alaska.edu/>

Good Earth Garden School

The Good Earth Garden School has a wealth of information on everything composting. Contact Ellen Vande Visse contact@ellenvandevisse.com or by phone at 907-745-0758. <https://goodearthgardenschool.com/>

Alaska Master Gardener Association - Anchorage Chapter

Email your composting questions and get answers back! Go to: <https://www.alaskamastergardeners.org/>

Composting tips from the Alaska Master Gardener Association

"In Glennallen where -60 F degree temperatures are common December through February, try mulching with tundra moss. In the spring, add it to the compost heap or burn some of it--mosquitoes hate it."

-Tom Thompson, Glennallen

"In Cordova, cold soils, a general absence of heat & a total lack of topsoil has encouraged me to search for new ways to compost. I make soil from composted peat, glacial sand & silt, old sawdust, vermiculite, etc."

-Ruth Fairall, Cordova



What about composting fish?



Fish composting requires a slightly different technique from regular composting due to the extreme odors.

The Petersburg Indian Association, located in Southeast Alaska, has been operating a successful fish waste composting operation for more than five years. The program is funded by PIA's IGAP program. Salmon carcasses are collected from local fish processing plants. Chipped alder is used as the carbon supply ("browns"). They use an in-vessel composting system which takes about five days for the material to go through the machine, making sure it has been at least 130F for three days. After discharge from the machine the compost cures for at least 30 days. Finished compost is sold to the public. When purchased the in-vessel composter was about \$15,000.



Contact: Brandon Thynes, IGAP Director, trd@piatribal.org 907-772-3636 ext 215

To read more about fish composting check out these sites:

Wood and Fish Residuals Composting in Alaska

<http://www.nrs.fs.fed.us/pubs/5378>

For more information about fish and wood composting contact:

US Forest Service

Dave Nicholls, Juneau Alaska, Phone: 907-747-4312



Is dog waste compostable?

The average dog can produce 274 pounds of waste each year. Composting dog waste is a simple and inexpensive method for disposing of dog waste that can enhance the environment, but it does have some limitations.

Dog compost is a safe soil additive for re-vegetation and landscaping when it is composted properly but it should **NOT** be used on crops grown for human consumption as the waste can transmit parasites and infectious disease.

When used in a potting mix or flower beds, a 25 percent compost blend is recommended. The compost has a relatively high salinity and is not recommended for germinating seedlings.

For more information on dog waste composting, Alaska's Natural Resource Conservation Service has a great guide of the whole process that can be downloaded from their website:

<https://greenvillesoilandwater.com/wp-content/uploads/2015/05/dogwastecomposting-NRCS-guide.pdf>



Community-scale composting in Alaska

Composting for an entire community with one operation is more involved than composting for an individual or for a household and there several important things to consider such as:

- How much material is going to be processed in a week, month or year?
- What is the composting method or equipment going to be?
- Is there going to be collections or will users self-haul?
- What is the facility layout?
- Where is the finished compost going to used?

How much material is going to be processed in a week, month or year?

Knowing how much material is going to be processed in an on-going basis helps determine what size of a facility is needed and helps determine how much labor is going to be needed to process the material. It is important to approach the project with the goal of making it sustainable. Often, individuals anticipating setting up a community-scale composting operation with conduct a waste characterization survey to help determine potentially how much material could be collected in in their community for a composting operation.

What is the composting method or equipment going to be?

There are several different ways to compost on a community scale such as: passively aerated static pile ("pile and smile") which is a basic system; a bin or bay system with a dedicated building for the composting process, likely using Aerated Static Pile (ASP) method for aeration; in-vessel composting where the composting process takes place inside a controlled environment; windrow system where material is placed in long rows which are periodically turned for aeration; or even anaerobic digestion where the composting process takes place in an oxygen-free environment and the methane produced is typically captured.

Each method has advantages and disadvantages in terms of initial construction cost and operating cost, labor requirements, capacity, or how much material can be composted over a given length of time, and odor.



Passively aerated static pile, the “pile and smile” method



Bin or bay system with Aerated Static Pile (ASP)



In-vessel composting equipment

Is there going to be collections or will users self-haul?

Determining if there is going to be a collection system, where food waste is collected from businesses and individuals or if business and individuals are going to be responsible for hauling their own material to the processing site, is an important determination. Collection programs will increase how much material is available to an operation but will add to cost and labor. Self-haul systems put the burden of collection on the public and are cheaper to operate but also depend on the interest of the community members to be viable.

What is the facility layout?

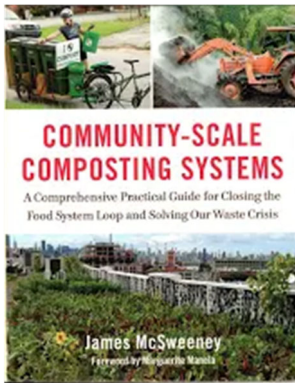
Facility layout is important. How are environmental factors like rain, snow, birds and bears going to be addressed? How easy is it for food waste to be delivered, processed and placed in composting area? Is there going to be a small garden for showing uses of the compost?

Where is the finished compost going to be used?

Knowing if the material is going to be used in local food production or is simply going to be land-spread helps determine how much quality control need to go into the process and how the finished compost will get to the people who want to use it. Will users come to facility and collect it?



Good resources for community-scale composting



Book - Community-scale composting systems, A comprehensive practical guide for closing the food system loop and solving our waste crises, James McSweeney, Chelsea Green Publishing. www.chelseagreen.com

This book provides an in-depth description of the composting process and composting systems. An excellent resource for anyone exploring community-scale composting

Institute For Local Self-Reliance <https://ilsr.org/composting/>

ISLR's composting website has a lot of resources for composting in communities. While much of their information is geared for cities in the lower-48, ISLR's overall approach to community and composting is very useful anywhere.

Good training programs for community-scale composting

Training is important when doing larger, community-scale composting operations. Training provides an opportunity to see how other composting facilities are conducting their operations, provides education into the science involved in composting and provides networking with other composting facility operators.

Washington Organic Resource Council Compost Facility Operator training

<https://www.compostwashington.org/compost-facility>

5-day training held in Puyallup, Washington. Usually scheduled for October.

US Compost Council, Compost Research and Education Foundation offers compost training programs in the lower-48 throughout the year in a variety of locations.

<https://www.compostfoundation.org/Education/COTC>

Great composting examples in Alaska

Gustavus

The Gustavus Disposal & Recycling Center (located in southeast) has had a great food waste composting program in place since 1996. Their operation composts between 40,000 - 70,000 pounds of food waste a year. They are currently using the passively aerated static pile method. Their program produces 10 - 20 yards of compost per year which is sold back to the community. The compost is used in many local gardens.

Community Contact: If you would like to talk to Gustavus about their composting program, call the DRC Operator at 907-697-2118 or email at: dumpmaster@gustavus-ak.us Also, you can see their Food Waste Composting Operating Plan at: https://cms.gustavus-ak.gov/sites/default/files/fileattachments/disposal_recycling_center/page/20091/2020_food_waste_composting_plan.pdf



Juneau

Juneau Composts! Is a private, commercial composting operation located in Alaska's capital City. They have been in operation since April 2017 and have collected and composted over one million pounds of food scraps since they started. Operating on an $\frac{1}{2}$ acre lot, their operation is lean and well run. They have an excellent Facebook page with frequent postings.

<https://www.facebook.com/juneaucomposts>

<https://www.juneaucomposts.com/>

Contact: Lisa Daugherty 907-419-5763
juneaucomposts@gmail.com



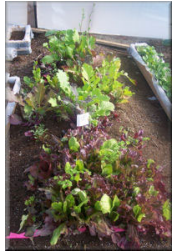
Akiak

In Akiak, compost is separated into three groups; dog scraps, rabbit scraps and worm scraps. The rabbits and worms provide excellent fertilizer for their vegetables and herbs grown in the community. Large plastic coffee cans and food cans are recycled to grow plants in them. The project is partially funded by the Alaska State Division of Behavioral Health.



Igiugig

Through a combination of funding sources including EPA IGAP, AK Food Coalition and AK Marketplace, Igiugig has started a community composting project. The Environmental program supplies the composting buckets. The village residents and local lodges then bring their compost to a centralized location. While they are still working out bear issues with their outside compost piles, the vermicomposting (using live worms) bins stay indoors and have been very successful. Food scraps, wood chips and chicken litter make a nutrient rich soil additive to use in their community greenhouse. Residents can sign up for a plot to grow their own vegetables and students help grow flowers for community beautification. Some of the herbs and vegetables grown are sold to local fishing lodges for their guests to enjoy fresh, locally grown produce.



Community Contact: Igiugig Village Council, Christina Salmon, Environmental Coordinator: 533-3211

Haines

Community Waste Solutions (CWS) is currently using the first in-vessel municipal waste composting operation in Alaska in place since 2003. The process requires raw sewage and will decontaminate both solid waste and sewage. CWS is producing as close to a "Class A" compost as possible using municipal garbage!



Community Contact: If you would like more information about Haines's composting project, contact: 907-766-2736, info@communitywastesolutions.com

Yakutat

In 2019 the Yakutat Tlingit Tribe started exploring the idea of doing community-scale composting. They did research including conducting a solid waste characterization study so they could determine, on average, how much food waste could be expected from each household and how many households and businesses could potentially use the service. They identified the in-vessel type of composting process was the best fit for their operation and located an area for doing the composting project. Project funding was through federal grants.



Community Contact: Penney James 907-784-2338 pjames@ytttribe.org

Using Biodegradable and Compostable Products

Companies are now making biodegradable or compostable products to use in the food packaging or service industry such as coffee cups and lids, napkins, cutlery, and to go containers. The products are made from plant-based materials that breakdown more quickly compared to the petroleum-based plastic and offer a healthy alternative to Styrofoam. The products need a commercial composting facility to efficiently and effectively biodegrade into soil, but these products will break down in the landfill without leeching toxins. Here are two distributors of compostable products in Alaska that have been in operation for a while:

Green Alaska Solutions™ located in Anchorage, Phone: (907) 351-4195

E-mail: deborah@greenalaskasolutions.com

www.greenalaskasolutions.com

Loopy Lupine LLC based out of Homer, Phone: (907) 235-5100

E-mail: orders@loopylupine.com

<http://loopylupine.com/>

Funding Sources

Funding Opportunities and EPA Programs Related to the Food System

<https://www.epa.gov/sustainable-management-food/funding-opportunities-and-epa-programs-related-food-system>

United States Department of Agriculture (USDA)

The USDA's Community Food Projects (CFP) Competitive Grants Program provides the major funding source for community-based food and agriculture projects nationwide.

<https://www.usda.gov/foodlossandwaste/funding>

Natural Resource Conservation Service

The Environmental Quality Incentives Program (EQIP) provides a voluntary conservation program that promotes agricultural production and environmental quality. EQIP offers financial and technical help to assist eligible participants install or implement structural and management conservation practices on eligible agricultural land. www.nrcs.usda.gov/programs-initiatives/eqip-environmental-quality-incentives and https://cig.sc.egov.usda.gov/?utm_source=nrcs-cig&utm_medium=site&utm_campaign=obv-redirect

NRCS offers Seasonal High Tunnel Systems through EQIP. Seasonal High Tunnels are polyethylene (plastic) covered structures that are used to cover crops to extend the growing season. For more information visit their website,

<http://www.ak.nrcs.usda.gov/programs/Seasonal%20HighTunnel%20QandA.html>

or contact your local NRCS Field office: <http://www.ak.nrcs.usda.gov/contact/fieldoffices.html>

Alaska Food Coalition Mini-grants

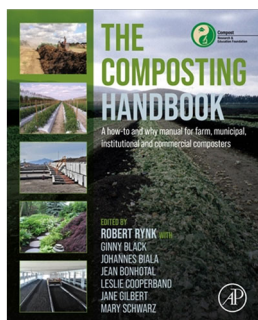
The Alaska Food Coalition offers mini-grants of up to \$1,000. These grants help food and nutrition programs build their capacity to distribute food. To be eligible you must be an existing member. For information on becoming a member: http://dnr.alaska.gov/ag/ag_grants.htm

Additional books about the composting process



On-Farm Composting Handbook, Editor Robert Rynk, Plant and Life Sciences Publishing (PALS).

This is a popular book used by educators. Contains a lot of useful reference material.



The Composting Handbook, A how-to and why manual for farm, municipal, institutional and commercial composters

Editors Robert Rynk et al, Academic Press.

Good reference for anyone setting up a community-scale composting operation.

Additional composting websites

<https://www.epa.gov/recycle/composting-home>

<https://extension.umn.edu/how-manage-soil-and-nutrients-home-gardens/composting-home-gardens>

<https://www.compostguide.com>

<http://www.plantea.com/compost.htm>