

Pilot Compost Pickup Program

by

Berl Eldridge
Chiemi Sugiyama
Jeff Hintz

ENVS 411, Richard Hansis
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Problem Statement:

We feel that too much organic food waste is being produced from multi-dwelling housing units in Arcata, as a result of both a lack of composting infrastructure and education.

We intend to implement a pilot composting program at a selected multi-dwelling complex in Arcata to reduce the amount of solid organic food waste sent to landfills from these units. In the past, there have been short lived programs which collected food waste from certain restaurants, but new permitting regulations have been passed in California that restrict the composting of food waste. Currently, 1/3 of Arcata's annual 11-12,000 tons of solid waste could be composted, with food waste accounting for 20% of that total (the other 10% being mostly leaves and grass). There are many multi-dwelling housing complexes (i.e. apartments and townhouses) within the city that produce considerable amounts of food waste, and in addition to the new permitting criteria for handling food waste, those complexes are challenged with having no compost services and very few of them have existing compost bins or gardens.

The city of Arcata's environmental services department actively promotes composting through its distribution of about 150 locally-made backyard green waste bins each year. However, these aren't applicable to multi-dwelling complexes due to their lack of gardens, outdoor space, or adequate compost knowledge, and they don't even deal with food waste.

In Arcata, employee-owned Mad River Compost is the only facility that has ever processed food waste from the city, and it continues to be the only facility in the city which processes green waste. The Humboldt State University Campus Recycling Program operates a limited composting facility which encourages drop-off and educational efforts. However, this site is impermanent, lacks interpretive opportunities, and takes only garden waste. Therefore, we would like to network with the city of Arcata, Mad River Compost, HSU, and a multi-dwelling complex to somehow divert more organic food waste from area landfills.

Goals and Objectives:

Goal 1:

Reduce the amount of organic waste going to landfills from multi-dwelling units.

Objectives:

- We distribute a survey to residents of a selected multi-dwelling complex to determine their willingness to participate in a pilot composting program in their facility.
- We start a pilot composting program at a selected multi-dwelling facility where 40% of residents participate.

Goal 2:

Increase collaboration between the City of Arcata, city waste services, HSU, and multi-dwelling facility owners and managers.

Objectives:

- We distribute a sheet to potential and future program participants that lists references for those interested in the multi-dwelling composting program.
- We increase citizen feedback to city of Arcata by 20 comments by end of 2006.

Goal 3:

Increase composting awareness at multi-dwelling complex.

Objectives:

- We create an easy to understand guideline sheet to residents (distributed with information packet) that provides them with some benefits of and instruction for composting.
- We distribute the sheet to 40% of participating residents by early May, 2006, and provide extras for potential future participants at a selected multi-dwelling complex.

Alternatives for achieving our goals:

Brainstorming

1. Establish curbside compost pickup once per week to multi-dwelling housing unit, with buckets distributed to participating residents along with an information sheet detailing the benefits and instructions of composting.
2. Same as #1, except once per month.
3. Same as #1, but with pickup from Mad River Composting.
4. Same as #1, but with pickup from HSU recycling services.
5. Establish an educational/interpretive drop-off facility at Mad River Compost where residents of a selected multi-dwelling housing complex receive compost buckets and can then take their compost free of charge.
6. Same as #5, but drop-off facility at HSU.
7. Provide residents of a multi-dwelling complex with extensive composting education, through informational packets, networking opportunities, and workshops.
8. Establish drop-off compost facility at a local pig farm for all residents of multi-dwelling units.
9. Establish mandatory composting regulations at a selected multi-dwelling housing complex, as enforced by property manager.
10. Same as #9, except composting regulations established citywide.
11. Establish and onsite compost facility at a selected multi-dwelling unit, complete with a communal compost bin, buckets distributed to individual residents, and interpretive signs detailing the how-to and benefit of composting.
12. Same as #11, but with pickup from Mad River Compost once per month, or when otherwise necessary.
13. Same as #11, but with pickup from HSU recycling services once per month, or when otherwise necessary.
14. Same as #11, but with a volunteer composting manager (provided with incentives).
15. Same as #11, but participating residents willingly contribute to compost management.

16. Establish a centrally located community drop-off facility at the Arcata city hall, where all city residents may take their organic waste.
17. Create an enclosure and provide a goat (or goats) at a selected multi-dwelling unit for the purpose of reducing its organic waste sent to landfill.
18. Begin a propaganda program at a selected multi-dwelling housing complex, designed to reduce overall consumption of organic foods.
19. Establish a program that would take organic waste from a selected multi-dwelling housing complex and convert it into usable methane, which would then provide energy for that particular dwelling.

These above initial solutions were a product of our brainstorming sessions. The following list eliminates any obvious alternatives that don't meet our objectives or that are unfeasible. Note: some of our narrowed-down alternatives may incorporate ideas from the above alternatives.

Alternatives, narrowed down:

1. Establish curbside compost pickup once per week at a selected multi-dwelling housing complex from Mad River Compost, with buckets distributed to participating residents and an information packet detailing the benefits of and instructions for composting.
2. Establish an educational/interpretive drop-off facility at either HSU or Mad River Compost, where residents of a selected multi-dwelling housing complex receive compost buckets and can then take their compost free of charge
3. Establish an onsite compost facility at a selected multi-dwelling unit, complete with a communal compost bin, buckets distributed to individual residents, and interpretive signs detailing the instructions to and benefits of composting.
4. Establish an onsite compost facility at a selected multi-dwelling unit, complete with a communal compost bin, buckets distributed to individual residents, and interpretive signs detailing the how-to and benefit of composting, but with once a month pickup from Mad River Compost (or when otherwise needed).
5. Same as #4, but where a volunteer composting manager is in charge (with incentives provided).
6. Provide residents of a multi-dwelling complex with extensive composting education, through informational packets, networking opportunities, and workshops.

7. Establish a centrally located community drop-off facility at the Arcata city hall, where all city residents may take their organic waste.
8. Establish mandatory composting regulations at a selected multi-dwelling housing complex, as enforced by property manager.

The above eight alternatives were agreed upon to best meet our objectives in reducing the amount of organic food waste going to the landfill. Those that did not make the list were determined to not satisfy our objectives, or they were impractical in regards to time, money, or other constraints. Listed below are the reasons for eliminating five of the eight narrowed-down alternative solutions.

2. Eliminated because we feel that our alternatives should be less interpretative in nature than this one.

5. Eliminated because it would be too time consuming at this stage in the semester. It would also be difficult to find a volunteer to take on such responsibilities and arrange incentives through the city. However, a volunteer will be incorporated if a suitable one is found.

6. Eliminated because it was too education oriented and didn't incorporate any implementation strategy.

7. Eliminated because it wouldn't satisfy all of our objectives. Transportation would still be required, and a centrally located site wouldn't be accessible by all multi-dwelling complexes.

8. Eliminated because the probability of finding a manager willing to force people to compost is unlikely.

The Final Three:

Our final three feasible alternatives were:

9. Establish curbside compost pickup once per week at a selected multi-dwelling housing complex from Mad River Compost, with buckets distributed to participating residents and an information packet detailing the benefits of, instructions for, and who to contact about composting.
3. Establish an onsite compost facility at a selected multi-dwelling unit, complete with a communal compost bin, buckets distributed to individual residents, and interpretive signs detailing the instructions to and benefits of composting.

4. Establish an onsite compost facility at a selected multi-dwelling unit, complete with a communal compost bin, buckets distributed to individual residents, and interpretive signs detailing the how-to and benefit of composting, but with once a month pickup from Mad River Compost (or when otherwise needed).

Preferred Alternative:

After setting up a meeting with Andrew Jolin (co-owner of Mad River Compost and Environmental Consultant with local GESS Environmental LLC.) to discuss our project, we decided that our best alternative would be to establish a pilot compost pickup program at a selected multi-dwelling complex. Ironically, he had been planning a collection program of his own for biodegradables (i.e. corn-based items, cardboard) and food scraps.

Upon actually meeting with him, Andrew fervently told us all about the Aerobic Digester being constructed in Fairhaven by California Liquid Fertilizer. Aerobic digesters are like bubbling compost cookers with bacteria that simulate and accelerate the natural composting process to create high quality, organic liquid fertilizer. The construction of a new digester fit in perfectly with our plan to reduce food waste from multi-dwelling complexes. Andrew also mentioned his consultation with other organizations to create special compost dumpsters and new pickup trucks designed for their collection, and expressed his enthusiasm in helping us with our project.

Therefore, with the completion of the digester in late September (tentatively), organic food waste will once again be able to be handled by local waste service providers. We would like Mad River Compost to provide us with a food waste pickup service to take out to the aerobic digester. At the advice of Andrew, it will be performed 2-3 times weekly, in order to minimize odor and pest problems, and will then be taken to the aerobic digester and processed by California Liquid Fertilizer. He hopes that the service will eventually serve the municipalities of Arcata and Eureka.

Implementation Strategies

The following strategies would meet our primary goal of reducing the total amount of organic waste going to landfills by establishing a pilot composting program at a local multi-dwelling housing unit where a minimum of 20% of residents would be willing to participate, as determined by our composting survey. The survey would also provide space for citizen feedback on composting.

The strategies would also satisfy our secondary goal of increasing collaboration between the City of Arcata, city waste services, multi-dwelling complex owners and managers, and HSU through our distribution of informational packets to them. These packets will contain a list of composting/waste management resources, and the benefits of and instructions for composting.

Finally, our third goal of increasing composting awareness at a multi-dwelling housing unit would be met through easy to understand composting guidelines distributed with our resource list provided as part of our informational packet, and be providing a composting seminar on site by May 6th.

Strategies:

1. Our group will provide a participating multi-family dwelling with a survey by April 14th to determine its residents' willingness to partake in our program, and to solicit feedback from them.
2. A communal compost bin (obtained through Mad River Compost, the City of Arcata, or the Arcata Community Recycling Center) will be located near the trash dumpsters on site.
3. A small bucket will be distributed to participating residents (if one is needed), along with an informational packet detailing the benefits of composting, proper composting procedures, and resources on who to contact for further composting information.
4. A volunteer compost manager may be selected from participating residents at selected multi-dwelling complex, provided that anyone is willing to accept responsibilities.
5. Through arrangements with Mad River Composting, pickup will be performed 1-3 times each week.

Schedule for implementation of pilot compost program:

The following is a rough timetable beginning on April 10th. It contains all of our important due dates and events.

MON	TUE	WED	THU	FRI	SAT	SUN
April 10 th Implementation strategy due	11	12 Meet with Andrew at Mad River Compost	13 Found willing multi-dwelling complex	14 Distribute survey	15	16
17	18	19	20	21 Decide seminar date	22	23
24 Monitoring and evaluation plan due	25	26 Drop off surveys at River Community Home	27	28	29	30
May 1 st	2	3 Pickup surveys from River Community Home	4	5	6 Seminar at multi-dwelling complex; pick representative for composting; check for more surveys	7
8	9	10 Paper due; Presentation	11	12	13	14

Evaluation and Monitoring Process:

Goal 1:

Reduce the amount of organic waste going to landfills from multi-dwelling complexes.

Objectives:

- We distribute a survey to residents of a selected multi-dwelling complex to determine their willingness to participate in a pilot composting program in their facility.
- We start a pilot composting program at a selected multi-dwelling facility where 40% of residents participate.

Reduction of organic waste going to landfills from multi-dwelling units will be evaluated by the number of residents participating in the pilot program. When 40% of residents are committed to the program, our 1st goal will be achieved.

To obtain 40 % of a multi-dwelling residents participating in our pilot composting program, we will hand out our survey, then evaluate the results. Once we have identified willing participants, we will hold a seminar by May 6th to assure that the proper level of knowledge is achieved for basic composting, as well as on special procedures set forth by Mad River Compost. At that point we hope to have a minimum of 40% of residents at the chosen multi-dwelling site with proper knowledge and the resources to begin composting.

We hope for the monitoring of our 1st goal to be achieved by adopting a compost manager at the multi-dwelling complex, as indicated through the survey or at our composting seminar. His/her responsibilities would include: monitoring and cleaning the area around the communal compost bin, fielding questions, and recruiting new participants. Ideally, the compost manager will frequently report the program's progress, as well as any residents' questions, back to Mad River Compost and other interested parties. Actual amount of liquid fertilizer being produced by aerobic digester, as well as a future survey conducted by Mad River Compost will help determine the success of organic waste reduction.

Goal #2:

Increase collaboration between the City of Arcata, city waste services, HSU and multi-dwelling facility residents and managers.

Objectives:

- Distribute a reference sheet as part of our information packet to current and future program participants that establishes regulations and references for multi-dwelling composting program.
- Increase citizen feedback to city of Arcata by 20 comments by end of 2006.

To evaluate whether our 2nd goal has been met, the number of information packets distributed to potential and future program participants will be used as a measure of collaboration. By providing composting resources in the packets, we hope to increase contact between the residents and managers of the multi-dwelling complex, the city of Arcata, and local waste service providers (i.e. Mad River Compost and Arcata Community Recycling Center). Feedback will hopefully be provided for the City of Arcata on our initial survey of residents, which we will then forward to Arcata's Resource Specialist Julie Neander. A subsequent survey will be distributed by Mad River Compost 50 days after the program's initiation to determine the program's success rate, and any increases in the amount of composting happening at the selected multi-dwelling complex will also be used as indicators of success. When all of our information packets have been distributed and citizen feedback has increased by 20 comments by the end of 2006, our 2nd goal will have been met.

Mad River Compost is currently working on its own monitoring plan for the program. In addition to the distribution of a future survey to monitor the collaborative success of the compost program, it will involve:

1. GESS staff assisting each participant with monitoring volumes of compost, contamination, and any problems and solutions.
2. GESS will write several reports evaluating the data and results of the pilot.

Goal 3:

Increase composting awareness at a multi-dwelling complex.

Objectives:

- Create easy to understand composting guidelines as a resource for where, how and who to contact for composting information.
- Distribute to both participants and potential participants of multi-dwelling units.

To determine if our 3rd goal has been met, we will hold a seminar at the participating multi-dwelling residence after our survey has been distributed and the results analyzed. At this time, any uncertainty and questions on the residents' behalf will be resolved. By educating a group of citizens within the residence, we hope that the overall composting knowledge within the community will be increased. If successful, the seminar will promote an easy way for additional multi-dwelling residents across Arcata to learn about, and participate in future composting efforts.

Each willing participant in the composting program will be given an information packet by our team at the seminar. Additional informational packets will be available at the manager's office for potential future participant.

The monitoring of our 3rd goal will be achieved at the seminar when our team is sure that at least 40% of residents can compost properly. The seminar will augment our information packets by providing residents with any additional information they may need to begin composting. Guidelines will be set forth on the sheet by Mad River Compost as to the specifics involved with their pick up procedure. The subsequent survey conducted by Mad River Compost 50 days after the initiation of the program will assist in the monitoring of compost awareness among multi-dwelling residents. This will also be a great opportunity for new residents to join our composting program.

Script:

We developed the following script for calling nearly a dozen different multi-dwelling complexes in the city of Arcata, to find one that is willing to participate:

-Hi, how are you today? My name is _____, and I'm a student at HSU enrolled in an Environmental Science senior project class where we are attempting to solve a perceived community problem.

-My group and I feel that there is too much organic, compostable waste going into regional landfills. We would like to implement a curbside composting program at your complex, where composting buckets and information sheets would be provided to willing residents, along with a communal compost bin for them to dump in their waste. The information sheets would contain the benefits and guidelines of composting, along with phone numbers of local composting resources. Then, a truck from Mad River Compost would come by once a week to collect the organic waste to minimize the chances of odor or pest problems.

-By diverting all that organic waste from the dump, you will save money on your overall garbage bill for the complex. You will also be creating a sellable product which acts to condition soils, minimize weeds, and suppress certain types of plant disease at schools and gardens in the area. Not to mention that you'll be helping Arcata meet its waste reduction requirements by the state.

-Would you like to hear more about our project?

-Your commitment to this endeavor would entail only minor responsibilities on your part, which would include: keeping the area around the communal bin clean and distributing information sheets to residents willing to participate. If you decide to participate, we would request your permission to distribute a survey to all residents of your complex determining whether or not anyone would be willing to act as a volunteer compost manager, which would relieve you of additional responsibility.

-Do you have any questions or concerns about our proposal?

-Well, are you interested in becoming the pilot member of our project?

-If yes: then we would like to set up a meeting with you to discuss the details of our project in person and to release our survey so that you can distribute them to residents in the complex.

Thank you!

We were finally able to find a multi-dwelling complex that is excited about participating in our pilot compost program. River Community Home, a 40 unit co-housing complex off Hallen Dr., currently has a compost bin as well as a small garden and a greenhouse where its residents can grow vegetables and fruits. However, the apartment manager, Amanda, told us that she would like to have a pickup service because much of the compost doesn't get used and just creates a hassle.

Composting Survey:

Our first step was to determine the overall willingness to participate in our program by residents of the River Community Home. We distributed the following survey to residents to make this determination:

Hello. We are a group of students at HSU working on a senior project for Environmental Science. We're would like to implement a pilot compost program at your multi-dwelling residence to help reduce the amount of compost-able material being sent to the landfill in Oregon. The program would provide a large compost dumpster that would be emptied a 2-3 times each week. There will also be small bins given out to those who need one, for individual use and transportation of your compost to the dumpster. We hope that participants will properly separate organic compostable materials from the main waste stream. Responsibilities might include limited maintenance at the communal compost bin's site. Below is a survey to give us some feedback as to how many people are willing to participate in our program and your concerns associated with the program. Please take a couple of minutes to fill it out. Your feedback is welcomed!

1.) Do you compost?

Yes or No

If no, please check reason(s) why you don't compost?

- I don't want to deal with odor and/or pests
- I don't know how to start
- I lack the space for a compost bin
- I don't want any responsibility for taking care of the bin
- I don't know what compost is
- Other: _____

2.) Are you interested in learning more about how to compost?

Yes or No

3.) Would you be willing to participate in a pilot compost project at your complex by taking your compost in a bucket issued to you down to an onsite compost dumpster, which would then be emptied on a regular basis? **Yes or No**

4.) If you answered yes to #3, would you also be willing to engage in minimal active participation in helping manage this program, performing tasks like: answering questions from other residents, keeping the drop off site clean, and separating compost from other garbage? **Yes or No**

If yes, please provide your name, phone number, and apartment unit number so that we may contact you.

Questions or comments:

Thank you for your time. Please return this survey to the front office.

After getting Amanda's permission to clip the surveys next to each resident's front door and placing a collection box for them in the front office, we allowed a week for residents to respond. When Jeff went to collect the surveys, the lack of turn out was somewhat disappointing: nine surveys in the box. However, what the surveys told us was that there is indeed a need for a compost pickup program among River Community Home residents who compost.

The surveys were valuable sources of insight. In addition to helping us find a resident who is willing to be the onsite compost manager at the River Community Home, the survey helped us in considering:

- That some people are concerned about odors and pests, the need to lift heavy objects and their lack of space for a composting bucket.
- That two survey respondents don't know how to compost but are interested in learning.
- That many interested residents have their own compost bucket already.
- That there is the potential for multiple compost managers at the site.

Residents also brought up a couple valid arguments that we hadn't even thought about. For instance, one woman was concerned that if all the compost if picked up and taken away, there wont be any for residents to use in their own

gardening. To remedy this concern, we will make sure that the existing composting bin remains in its location for residents to put some of their compost if they so desire, and the compost dumpster will act as a supplement to it. Another concern that was brought up was that people must keep their garbage out of the compost. We hope that the residents who have expressed interest in managing the composting operation will monitor the compost for items which do not belong (i.e. plastics, and metal).

Information packets:

We put together the following packet containing useful information about the benefits of composting, instructions for composting food waste properly, and local resources for additional composting information. We intend these packets to be beneficial not only for the current and future participants in our pilot composting program, but also for those residents who compost but choose not to participate, apartment managers, city officials, local businesses, and interested students and faculty at Humboldt State University.

These packets were distributed to resident of the River Community Home during our seminar on May 6th. While the seminar never materialized as such, the time allotted was well spent going door-to-door handing out information packets to participating residents, answering questions, collecting any additional surveys, and becoming more familiar with the environment and residents of the complex in general.

Information contained in the packet:

Benefits of Compost Use

As more and more compost is produced and utilized and as the body of end-use related research grows, the benefits of using compost have become more evident and measurable. Because of its many attributes, compost is extremely versatile and beneficial in many applications. Compost has the unique ability to improve the properties of soils and growing media physically (structurally), chemically (nutritionally), and biologically. Although many equate the benefit of compost use to lush green growth, caused by the plant-available nitrogen, the real benefits of using compost are long-term and related to its content of living-organic matter.

Physical Benefits

Improved Structure

Compost can greatly enhance the physical structure of soil. In fine-textured (clay, clay loam) soils, the addition of compost will reduce bulk density, improve friability (workability) and porosity, and increase its gas and water permeability, thus reducing erosion. When used in sufficient quantities, the addition of compost has both an

immediate and long-term positive impact on soil structure. It resists compaction in fine-textured soils and increases water-holding capacity and improves soil aggregation in coarse-textured (sandy) soils. The soil-binding properties of compost are due to its humus content. Humus is a stable residue resulting from a high degree of organic matter decomposition. The constituents of the humus act as a soil 'glue,' holding soil particles together, making them more resistant to erosion and improving the soil's ability to hold moisture.

Moisture Management

The addition of compost may provide greater drought resistance and more efficient water utilization, therefore, the frequency and intensity of irrigation may be reduced. Recent research also suggests that the addition of compost in sandy soils can facilitate moisture dispersion by allowing water to more readily move laterally from its point of application.

Chemical Benefits

Modifies and Stabilizes pH

The addition of compost to soil may modify the pH of the final mix. Depending on the pH of the compost and of the native soil, compost addition may raise or lower the soil/compost blend's pH. Therefore, the addition of a neutral to slightly alkaline compost to an acidic soil will increase soil pH if added in appropriate quantities. In specific conditions, compost has been found to affect soil pH even when applied at quantities as low as 10-20 tons per acre. The incorporation of compost also has the ability to buffer or stabilize soil pH, whereby it will more effectively resist pH change.

Increases Cation Exchange Capacity

Compost will also improve the cation exchange capacity of soils, enabling them to retain nutrients longer. It will also allow crops to more effectively utilize nutrients, while reducing nutrient loss by leaching. For this reason, the fertility of soils is often tied to their organic matter content. Improving the cation exchange capacity of sandy soils by adding compost can greatly improve the retention of plant nutrients in the root zone.

Provides Nutrients

Compost products contain a considerable variety of macro and micronutrients. Although often seen as a good source of nitrogen, phosphorous, and potassium, compost also contains micronutrients essential for plant growth. Since compost contains relatively stable sources of organic matter, these nutrients are supplied in a slow-release form. On a pound-by-pound basis, large quantities of nutrients are not typically found in compost in comparison to most commercial fertilizers. However, compost is usually applied at much greater rates; therefore, it can have a significant cumulative effect on nutrient availability. The addition of compost can affect both fertilizer and pH adjustment (lime/sulfur addition). Compost not only provides some nutrition, but often makes current fertilizer programs more effective.

Biological Benefits

Provides Soil Biota

Soil microorganisms include bacteria, protozoa, actinomycetes, and fungi. They are not only found within compost, but proliferate within soil media. Microorganisms play an important role in organic matter decomposition which, in turn, leads to humus formation and nutrient availability. Microorganisms can also promote root activity as specific fungi work symbiotically with plant roots, assisting them in the extraction of nutrients from soils. Sufficient levels of organic matter also encourage the growth of earthworms, which through tunneling, increase water infiltration and aeration.

Suppresses Plant Diseases

Disease incidence on many plants may be influenced by the level and type of organic matter and microorganisms present in soils. Research has shown that increased population of certain microorganisms may suppress specific plant diseases such as pythium and fusarium as well as nematodes. Efforts are being made to optimize the composting process in order to increase the population of these beneficial microbes.

Additional Benefits of Compost

Some additional benefits of compost have been identified, and has led to new uses for it. These benefits and uses are described below.

Binds Contaminants

Compost has the ability to bind heavy metals and other contaminants, reducing both their leachability and absorption by plants. Therefore, sites contaminated with various pollutants may often be improved by amending the native soil with compost. The same binding affect allows compost to be used as a filter media for storm water treatment and has been shown to minimize leaching of pesticides in soil systems.

Degrades Compounds

The microbes found in compost are also able to degrade some toxic organic compounds, including petroleum (hydrocarbons). This is one of the reasons why compost is being used in bioremediation of petroleum contaminated soils.

Wetland Restoration

Compost has also been used for the restoration of native wetlands. Rich in organic matter and microbial population, compost and soil/compost blends can closely simulate the characteristics of wetland soils, thereby encouraging the re-establishment of native plant species.

Erosion Control

Coarser composts have been used with great success as a mulch for erosion control and have been successfully used on sites where conventional erosion control methods have not performed well. In Europe, fine compost has been mixed with water and sprayed

onto slopes to control erosion.

Weed Control

Immature composts or ones which possess substances detrimental to plant growth (phytotoxins), are also being tested as an alternative to plastic mulches for vegetable and fruit production. While aiding in moisture conservation and moderating soil temperatures, immature composts also act as mild herbicides.

Benefits of Using Compost

- Improves the soil structure, porosity, and density, thus creating a better plant root environment.
- Increases moisture infiltration and permeability of heavy soils, thus reducing erosion and runoff.
- Improves water-holding capacity, thus reducing water loss and leaching in sandy soils.
- Supplies a variety of macro and micronutrients.
- May control or suppress certain soil-borne plant pathogens.
- Supplies significant quantities of organic matter.
- Improves cation exchange capacity (CEC) of soils and growing media, thus improving their ability to hold nutrients for plant use.
- Supplies beneficial micro-organisms to soils and growing media.
- Improves and stabilizes soil pH.
- Can bind and degrade specific pollutants.

Food Wastes: Vermicomposting and Food Digesters

Vermicomposting or worm composting is the easiest way to recycle food wastes and is ideal for people who do not have an outdoor compost pile. Composting with worms avoids the needless disposal of vegetative food wastes and enjoy the benefits of a high quality compost. It is done with "redworms" (*Eisenia foetida*) who are happiest at temperatures between 50= and 70= F and can be kept indoors at home, school, or the office. As with outdoor composting, it is best to avoid putting bones, meats, fish, or oily fats in the worm box as they emit odors and may attract mice and rats. When cared for properly, worms process food quickly and transform food wastes into nutrient-rich "castings." Worm castings are an excellent fertilizer additive for gardens or potted plants.

The redworms are placed in a box or bin which can be built or purchased, along with "bedding" of shredded cardboard and/or paper moistened to about 75% water content. The container should be wide enough so that food scraps can be buried in a different location each time. The dimensions of the container and the amount of

worms required initially will depend on how much organic food waste will need to be composted each week.

The worms will gradually reproduce or die according to the amount of food they receive. A sudden addition of a large amount of food waste may attract fruit flies, so increases should be made gradually. In a healthy box, worms can build large populations and consume four to six pounds of food scraps per week. About four to six months after the box has been started, the worms will have converted all of the bedding and most of the food waste into "castings" which will need to be harvested so the process can begin again.

Food waste digesters are an option for people who want to reduce the amount of food waste they produce but do not have a compost pile. They are designed to accept food wastes otherwise inappropriate for composting such as meats, fish, fats, or oily food scraps. In general they are built to prevent odors from being released and prevent rodents from entering the unit. Food waste digesters are fundamentally different from worm boxes and compost piles, because the digesters do not ultimately produce a soil enhancing product. Their purpose is to cut down on the volume of food waste generated. Food waste digesters are not a "magic hole in the ground" however, and the decomposed food residue must periodically be emptied into the trash.

Following is a chart listing common composting materials:

Type of Material	Use it?	Carbon/ Nitrogen	Details
Algae, seaweed and lake moss	Yes	N	Good nutrient source.
Ashes from coal or charcoal	No	n/a	May contain materials bad for plants.
Ashes from untreated, unpainted wood	Careful	Neutral	Fine amounts at most. Can make the pile too alkaline and suppress composting.
Beverages, kitchen rinse water	Yes	Neutral	Good to moisten the middle of the pile. Don't over-moisten the pile.
Bird droppings	Careful	N	May contain weed seeds or disease organisms.
Cardboard	Yes	C	Shred into small pieces if you use it. Wetting it makes it easier to tear. If you have a lot, consider recycling instead.
Cat droppings or cat litter	No	n/a	May contain disease organisms. Avoid.
Coffee ground and filters	Yes	N	Worms love coffee grounds and coffee filters.

Compost activator	Not required, but ok.	Neutral	You don't really need it, but it doesn't hurt.
Cornstalks, corn cobs	Yes	C	Best if shredded and mixed well with nitrogen rich materials.
Diseased plants	Careful	N	If your pile doesn't get hot enough, it might not kill the organisms, so be careful. Let it cure several months, and don't use resulting compost near the type of plant that was diseased.
Dog droppings	No	n/a	Avoid.
Dryer lint	Yes	C	Compost away! Moistening helps.
Eggshells	Yes	O	Break down slowly. Crushing shells helps.
Fish scraps	No	n/a	Can attract rodents and cause a stinky pile.
Hair	Yes	N	Scatter so it isn't in clumps.
Lime	No	n/a	Can kill composting action. Avoid.
Manure (horse, cow, pig, sheep, goat, chicken, rabbit)	Yes	N	Great source of nitrogen. Mix with carbon rich materials so it breaks down better.
Meat, fat, grease, oils, bones	Careful	n/a	Avoid. Note: Only acceptable for use with aerobic digesters
Milk, cheese, yogurt	Careful	Neutral	Put it deep in the pile to avoid attracting animals.
Newspaper	Yes	C	Shred it so it breaks down easier. It is easy to add too much newspaper, so recycle instead if you have a lot. Don't add slick colored pages.
Oak leaves	Yes	C	Shredding leaves helps them break down faster. They decompose slowly. Acidic.
Sawdust and wood shavings (untreated wood)	Yes	C	You'll need a lot of nitrogen materials to make up for the high carbon content. Don't use too much, and don't use treated woods.
Pine needles and cones	Yes	C	Don't overload the pile. Also acidic and decomposes slowly.
Weeds	Careful	N	Dry them out on the pavement, then add later.
Sod	Careful	N	Make sure the pile is hot enough, so grass doesn't continue growing.

Source: US Composting Council, at www.compost.org and www.compostingcouncil.org

Some waste statistics for Arcata:

Household Disposal Rates (2000)

Total Household Waste Disposal (Tons/Yr.)	4,873
Resident Daily Disposal (lbs. per Resident/Day.)	2

Top 4 Specific Materials in Household Disposal (Based on 1999 Statewide Estimates)

Specific Material Type	%	Tons
Food	20.0%	1,443
Leaves and Grass	10.5%	756
Remainder/Composite Organic	9.5%	684
Remainder/Composite Paper	8.1%	582

Source: California Integrated Waste Management Board

Composting references:

This sheet provides a comprehensive list of local composting resources. Please feel free to contact them if you have any questions, comments, or concerns!

- Mad River Compost: (707) 840-WORM.
Your compost pickup service provider.
- River Community Home- Amanda: (707) 825- 8371. 1061 Hallen Dr. Arcata.
Your onsite complex manager.
- Humboldt State University's Campus Recycling Program: (707) 826-4162.
Innovative recycling program with a great composting demonstration site located at HSU.
- Arcata Community Recycling Center: (707) 822-4321. 1380 9th St. Arcata.
The oldest community recycling center in the U.S.
- Gess Environmental LLC- Andrew: (707) 840-9610. Consulting firm working with Mad River Compost to divert your organic waste.
- California Liquid Fertilizer (CLF): 1-877-675-8600. Your food waste will go to their Aerobic Digester being constructed in Fairhaven, where it will become high quality liquid fertilizer.
- City of Arcata Environmental Services department: (707) 822-8184.
Email: eservices@arcatacityhall.org
Keeping Arcata beautiful.
- City of Arcata Resource Specialist Juli Neander: (707) 825-2151.
Good resource for general waste management information.

The future of our program:

Our group encountered certain problems in trying to accomplish our three goals during the course of the semester. First, there was a lack of time. One semester was a considerably short period of time to develop this project. Although our first goal of reducing the amount of organic waste going to the landfill has yet to be fully accomplished, we have laid the foundation to facilitate the implementation of the food waste pickup at the River Community Home, once the CLF aerobic digester has been constructed in Fairhaven around October 2006.

A second problem involved establishing formal connections with Mad River Compost, people from the city of Arcata, HSU, and multi-dwelling facility owners and managers. Presumably due to their busy schedules, our contacts weren't always available, and their lack of prompt feedback frequently resulted in delays to our project. Our second goal has only been partially achieved, with our distribution of our information packet to said parties. We hope to further collaboration between them, but achieving this goal completely will require much more time and work than our group was able to allow for.

One final significant problem was our falling short on the number of residents willing to participate in the pilot compost pickup program. Perhaps we set the bar too high, with our objective being 40% of residents, when our time and resources were fairly prohibitive. Also, it remains unclear whether or not composting awareness has yet been increased at the multi-dwelling complex, because those people who are willing to participate already possessed considerable knowledge about composting and because we are not yet aware of any formal communication between the entities listed on our reference sheet.

In conclusion, our program has great potential to reduce the amount of organic food waste produced by a multi-dwelling complex. However, due to the complexity of arranging the program, we feel that much more time and effort will be needed in order to actually receive any tangible benefits from it. Therefore, we hope for a future HSU Environmental Science class to be able to pick up where we left off; working to divert food waste where it is sorely needed, Arcata's multi-dwelling complexes.

* Email from Andrew Jolin *

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----- Original Message -----

Subject: Re: composting senior project**From:** [Chiemi Sugiyama](#)**Date:** Wed, March 29, 2006 18:11**To:** [j2081@aol.com](#)

Chiemi, Burl, and Jeff:

Your e-mail is timely, because I am just now planning a pilot two-stream collection program for biodegradables and food scraps. The senior project that you describe will fit in well.

If it is OK with you I would like to add your multi-dwelling housing unit to the work scope of our pilot that we are launching on Earth Day (April 22). I have revised and attached the proposal for your reference.

Just yesterday we submitted the draft proposal to the local municipalities, and today Eureka and Arcata agreed to fund it. We are waiting to here from Fortuna and NatureWorks (the manufacturer PLA - biodegradable plastic).

As you can see, we have included HSU as one of the participants, meaning we are planning on working with Alec Cooley to organize two-stream collection (food and biodegradables) at HSU for the fall semester. In the meantime, we could make your multi-dwelling housing unit part of the first phase of this pilot, which is biodegradables only.

Please understand that we will collect no food waste until California Liquid Fertilizer (CLF) has their aerobic digester plant up and running in Fairhaven in about 6-9 months, because we have no permit to take food waste. There is no compost facility in the County that is permitted to take food waste, but we are in a very unique position to have CLF building their model plant here in Humboldt. It makes our jobs much easier, because aerobic digestion of food waste into high-end organic liquid fertilizer is the way to go.

We can fit your ideas into our pilot including:

"buckets distributed to participating residents and an information sheet detailing the benefits and how-to's of composting.

"analyzing potential problems we would encounter such as a mixture of

1.) What kinds of biodegradables will you want to accept before biogas?

a.) Bins? Goal: complete service provided - monthly bill

3.) Cost of pickups, how many trucks? \$90/ton - flat fee for dumpster

4.) What will be the impact? Goal: talk to City Arcata - total waste generated? what % food waste?

5.) How far are trucks willing to go for pickup? Will service mun. that funding the service.

Working in design in compost + trucks - business

- Bokashi - amazing absorbent material

- Biogas digester? Bubbling cooker

CA. 1.6 with bacteria & aerobic. www.liquidfertilizer.com

- recycling cardboard is better than composting

- Mad River Compost is an employee-owned. 25-30 people in the whole process. private trash. Spent packaging.

* - Will send us the plan for giving to managers &

- Raw food waste: Anything but meat.

- Biodegradable: Corn-based items, potato starch

- 1 LB. / running foot of worms in worm bins.

heavy, stinky fish

- Food waste: digester has the ability to process a high vol. high quality. 1. Digested - produces "a compost tea", a. solid residual taken sold

- Never kept more than a couple days - consistent pickup necessary.

- Financial incentive to separate food waste from other trash. \$90/ton -> \$50/ton - Saves money

* Email from Andrew Jolin *

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From: "Chiemi Sugiyama" <cs77@humboldt.edu>

Date: Thu, March 30, 2006 11:23 am

To: j2081@aol.com (you)

Priority: Normal

Options: [View Full Headers](#) | [View Printable Version](#) | [View Message Details](#)

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We can fit your ideas into our pilot including:

"buckets distributed to participating residents and an information sheet detailing the benefits and how-to's of composting.

"analyzing potential problems we would encounter such as a mixture of

non-compostables in food waste and odor/pests at the pick up site. We have some ideas of overcoming the issues like providing the residents information sheet and providing buckets with lids.

"Analyzing potential barriers like:
odor/pest
lack of knowledge
convenience
extra work for managers
educating new residents"

As further background, here is some information we provided the cities:

"We are in a unique position to track biodegradables locally, because in addition to composting, we also supply biodegradables to event producers, stores and others, so we know who is using what volumes and types of biodegradables locally.

Eureka Public Schools and the State Waste Board also contact us regularly to encourage us to get set up to take food and biodegradables. However, first we must have the collection system in place to divert these materials. As you may know, last year we tried to work with events, like Organic Planet Festival, to divert biodegradables. However, we did not yet have the processing capabilities and there was a need to first do a pilot to create a new collection system where food waste was removed from biodegradables, so that we could take them with our current permit.

Several recent developments have put us in a better position to now do a pilot:

1. New drop-off and composting site at West End Road.
2. Cover-All building being constructed at West End Road.
3. California Liquid Fertilizer (CLF) being constructed at Fairhaven.

CLF is breaking ground in May in Fairhaven and we will be breaking ground on our Cover-All building at West End Road around the same time. CLF's state-of-the-art aerobic digester will be able to take all food waste we collect and we will back haul the solid residual from CLF to West End Road for composting. As for biodegradables (corn, potato and bagasse-based service ware and packaging) we will also compost together with the green material and food residual under our Cover-All at West End Road.

To get food scrap and biodegradables collection going for Humboldt County events, restaurants, stores, HSU, United Indian Health Services and others, we have drafted the attached pilot proposal, and would appreciate your feedback."

Best Regards,

Andrew Jolin
Managing Member
GESS Environmental LLC
(707) 840-9676

Chiemi Sugiyama

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* GESS Env. LLC Research Plan *

In addition to the EA Notification requirements set forth in Title 14, California Code of Regulations, Division 7, Chapter 5.0, Article 3.0, section 18103.1 (a)(3), the operator shall provide a description of the research to be performed, research objectives, methodology/protocol to be employed, data to be gathered, analysis to be performed, how the requirements of this subchapter will be met, and the projected timeframe for completion of the research operation.

1. Description of Research

There are two components to the Two-Stream Organics Diversion Pilot:

a) "Source Separation"

As background, in the past 2 years several event producers have tried to become zero waste events including Reggae on the River, Organic Planet Festival, Jacoby Creek School and others. To do so, these event producers used biodegradable plates, utensils, cups and packaging with the hope of diverting it from the landfill. Currently there is no facility in Humboldt County that accepts biodegradables, but GESS Environmental LLC is considering accepting them if we can prove through this pilot that we can successfully separate, collect and deliver them to our current Green Material Compost Operation on West End Road in Arcata.

By successfully separate, we mean removing close to 100% of the food scraps from the biodegradables so that it can be composted at West End Road, with the food waste collected separately and delivered to California Liquid Fertilizer (CLF) in Fairhaven. Of the previous events listed above, only Jacoby Creek School's Fall Festival successfully separated food scraps from biodegradables through point-of-disposal education on separation. By using "source separation" before food scraps get mixed in with biodegradables, contamination is avoided.

b) CLF Inoculant

Until now the event producers listed above did not have the option of GESS' more sophisticated compost facility with new Cover-All building, which allows more effective control of moisture levels and temperatures; and they did not have the unique opportunity of having a local liquid fertilizer plant to send its food waste. CLF's new plant in Fairhaven not only provides a diversion option for event producers and other local food scrap generators, but it also produces a stable solid residual that GESS will use to inoculate its compost windrows, increasing temperatures and increasing GESS' ability to compost biodegradables.

GESS has learned that some Green Material Compost Operations have tried unsuccessfully to compost biodegradables because their moisture levels vary and bring compost temperatures down, thus making it difficult to compost biodegradables that require good compost temperatures (130 degrees) to break down. However, with GESS' new Cover-All building on West End Road, along with the inoculant from CLF, GESS can keep compost temperatures high enough to successfully compost biodegradables.

2. Research Objective

City of Eureka and City of Arcata will sponsor this Pilot Two-Stream Organics Diversion project with the objective of developing diversion options for food scraps and biodegradables. By first sending food waste to CLF digester in Fairhaven, GESS will not have to take raw food waste, reducing potential odor, vector and water quality issues related to food scraps. In addition, the inoculant from CLF will increase GESS' ability to effectively compost biodegradables.

3. Methodology/Protocol

To prove the viability of Two-Stream Collection, we must create and validate methods of "source separation" at the events and venues; and methods of maintaining good compost temperatures at the compost facility.

a) "Source Separation"

GESS learned at Jacoby Creeks' Fall Festival that constant monitoring and education at the point-of-disposal is essential to complete separation of food scraps from biodegradables. Methods of "source separation" to be validated at events and venues include constantly staffed collection stations and clear signage.

- Event producer staff and volunteers will interface with all biodegradable users at collection stations. Users will be directed to separate bins for biodegradables and food scraps, and educated on the reason for this separation.
- Clear signage will also be placed at each collection station to reinforce the efforts of staff and volunteers at collection stations.

To test these methods, a control collection station will also be set up where no event staff or volunteers are working, but only signage to direct users to separate bins. If significant food scrap contamination of the biodegradables bin occurs at this unmanned station, the biodegradable will be disposed of as trash at the Hawthorne St. transfer station.

b) CLF Inoculant

The primary method of maintaining good compost temperatures to be validated by this pilot is inoculation by CLF solid residual. The CLF aerobic digestion process has already proven in the Central Valley to create a valuable and stable solid residual from food scraps that is good for increasing the nutrient level and quality of compost. Now we will test to see if the inoculant can also effectively increase compost temperatures to assist in the break down of biodegradables.

To test this method, a control compost windrow will be made where CLF inoculant is not added.

4. Data to be Gathered

A report will be written by GESS Environmental including data gathered through "source separation" and CLF inoculant tests. Volumes and percentages of food scraps contaminating biodegradable bins with or without monitors will be illustrated, and compost temperatures with or without CLF inoculant will be compared in a final report after the 9-month pilot.

5. **Analysis to be Performed**

a) **“Source Separation”**

Waste audits to be performed by GESS staff at West End Road before composting or sending to landfill. Biodegradable bins to be dumped on specially designed compost pad under Cover-All building at West End Road to absorb potential food waste contamination. Food contamination volumes to be estimated through this waste audit.

b) **CLF Inoculant**

A temperature probe will be used to take temperatures of compost windrows with or without inoculant. For the typical 90 turned compost period temperatures will be recorded and analyzed to make conclusions for the final report.

6. **Timeframe**

Approximately 9 months between April, 2006 – December, 2006

* Respondents' surveys *

Survey

Hello. We are a group of students at HSU working on a senior project for Environmental Science. We're hoping to implement a pilot compost pickup program at your multi-dwelling residence to help reduce the amount of compost-able material going to the landfill in Oregon. The program would provide a large compost dumpster that would be emptied 2-3 times per week. There will also be individual buckets given out to each participating resident to use and transport their organic waste to the dumpster. Below is a survey to give us some feedback as to how many people are willing to participate and to determine any concerns associated with the program. Please take a couple of minutes to fill it out. Your feedback is welcomed!

1.) Do you compost?

Yes or No

If no, please check reason(s) why you don't compost?

- I don't want to deal with odor and/or pests
- I don't know how to start
- I lack the space for a compost bin
- I don't want any responsibility for taking care of the bin
- I don't know what compost is
- Other: _____

2.) Are you interested in learning more about how to compost?

Yes or No

3.) Would you be willing to participate in a pilot compost project at your complex by taking your compost in a bucket issued to you down to an onsite compost dumpster, which would then be emptied on a regular basis?

Yes or No

I already have a bucket

4.) If you answered yes to #3, would you also be willing to engage in minimal active participation in helping manage this program, performing tasks like: answering questions from other residents, keeping the drop off site clean, and separating compost from other garbage?

Yes or No

but people need to keep their garbage out

If yes, please give us your name, phone number, and apartment unit number:

Rachael Iverson 1031A 825-1733

We will host a half hour composting seminar on Saturday, May 6th at 1:00 pm, where buckets and information sheets will be provided. You are cordially invited to attend to learn more about our project and to ask us questions!

Questions or comments:

We already compost here and I use the soil frequently if it is hauled off how can I use it?

Thank you for your time. Please return this survey to the front office.

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Yes or No

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Yes or No

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Yes or No

If yes, please give us your name, phone number, and apartment unit number:

Joyce Seehaver 822-2874 1071-A

We will host a half hour composting seminar on Saturday, May 6th at 1:00 pm, where buckets and information sheets will be provided. You are cordially invited to attend to learn more about our project and to ask us questions!

Questions or comments:

This could go well here as long as you do not try to ask people here to turn it.

Thank you for your time. Please return this survey to the front office.

Survey

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Yes or No

If yes, please give us your name, phone number, and apartment unit number:

Brandy Hinrichs 825-0927 1031 F

We will host a half hour composting seminar on Saturday, May 6th at 1:00 pm, where buckets and information sheets will be provided. You are cordially invited to attend to learn more about our project and to ask us questions!

Questions or comments:

YEAH!!!! Thank you sooo much -
We desperately need help from enthusiastic
composters!

Thank you for your time. Please return this survey to the front office.

I won't be able to make it to the workshop due to other obligations → Please leave info. for me on my door bucket. Thanks!!!

* Composting manager *

Hello. We are a group of student at HSU working on a senior project for Environmental Science. We're hoping to implement a pilot compost program at your multi-dwelling residence to help reduce the amount of compost-able material going to the landfill in Oregon. The program would provide a large compost dumpster that would be emptied a few times per week. There will also be small bins given out for individual use and transport to the dumpster. Participates will properly separate organic compost-able materials from the main waste stream, and duties might include limited maintenance at community site. Below is a survey to give us some feed back of how many people are willing to participate and concerns associated with the program. Please take a couple of minutes to fill it out. Your feedback is welcomed!

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||| |
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Yes or No
||| |

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Yes or No
|| | *don't know*
||

If yes, please give us your name, phone number, and apartment unit number.

Questions or comments:

Chris Pontillo unit #7
(707) 822-5129 1011

Thank you for your time. Please return this survey to the front office.

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Yes or No

If yes, please give us your name, phone number, and apartment unit number.

Questions or comments:

What can I do without lifting

822-5737

Thank you for your time. Please return this survey to the front office.

Hello. We are a group of student at HSU working on a senior project for Environmental Science. We're hoping to implement a pilot compost program at your multi-dwelling residence to help reduce the amount of compost-able material going to the landfill in Oregon. The program would provide a large compost dumpster that would be emptied a few times per week. There will also be small bins given out for individual use and transport to the dumpster. Participates will properly separate organic compost-able materials from the main waste stream, and duties might include limited maintenance at community site. Below is a survey to give us some feed back of how many people are willing to participate and concerns associated with the program. Please take a couple of minutes to fill it out. Your feedback is welcomed!

1.) Do you compost?

Yes or No

If no, please check reason(s) why you don't compost?

- I don't want to deal with odor and/or pests
- I don't know how to start
- I lack the space for a compost bin
- I don't want any responsibility for taking care of the bin
- I don't know what compost is
- Other: _____

2.) Are you interested in learning more about how to compost?

Yes, or No

3.) Would you be willing to participate in a pilot compost project at your complex by taking your compost in a bucket issued to you down to an onsite compost dumpster, which would then be emptied on a regular basis?

Yes or No

4.) If you answered yes to #3, would you also be willing to engage in minimal active participation in helping manage this program, performing tasks like: answering questions from other residents, keeping the drop off site clean, and separating compost from other garbage?

Yes or No

If yes, please give us your name, phone number, and apartment unit number.

Questions or comments:

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Yes or No

I HAVE
I STOPPED
BECAUSE

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* Additional compost info *

Composting Guide



Why
Benefits
Basics
References

Why Compost?

Recycling the organic waste of a household into compost allows us to return organic matter to the soil. In this way, we participate in nature's cycle, and cut down on garbage going into landfills.

Amount of trash thrown out by average person annually: 1,500 pounds. Amount of trash thrown out by person who composts: 375 pounds.

Some waste statistics for Arcata:

Household Disposal Rates (2000)

Total Household Waste Disposal (Tons/Yr.)	4,873
Resident Daily Disposal (lbs. per Resident/Day.)	2

Top 4 Specific Materials in Household Disposal (Based on 1999 Statewide Estimates)

Specific Material Type	%	Tons
Food	20.0%	1,443
Leaves and Grass	10.5%	756
Remainder/Composite Organic	9.5%	684
Remainder/Composite Paper	8.1%	582

Benefits

Composting has numerous benefits that reduce overall waste to creating a healthy ecosystem. The more humans utilize composting in our everyday lives; we can build a culture that emphasizes research and development for an “eco-economy”.

- Improves the soil structure, porosity, and density, thus creating a better plant root environment.
- Increases moisture infiltration and permeability of heavy soils, thus reducing erosion and runoff.
- Improves water-holding capacity, thus reducing water loss and leaching in sandy soils.
- Supplies a variety of macro and micronutrients.
- May control or suppress certain soil-borne plant pathogens.
- Supplies significant quantities of organic matter.
- Supplies beneficial micro-organisms to soils and growing media.
- Improves and stabilizes soil pH.
- Can bind and degrade specific pollutants.

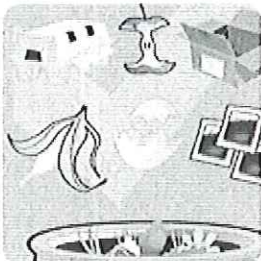
Composting basics

Step One – Placing Your Bin



It's best to site your bin on a level, well-drained spot. This allows excess water to drain out and makes it easier for helpful creatures such as worms to get in and get working on breaking down the contents. For indoor composting its best in dark mild climate such as under sink.

Step Two - Put these in



Like any recipe, your compost relies on the right ingredients to make it work. Good things you can compost include vegetable peelings, fruit waste, teabags, plant pruning's and grass cuttings. These

are considered "**Greens.**" Greens are quick to rot and they provide important nitrogen and moisture. Other things you can compost include cardboard egg boxes, scrunched up paper and fallen leaves. These are considered "**Browns**" and are slower to rot. They provide fiber and carbon and also allow important air pockets to form in the mixture. Crushed eggshells can be included to add useful minerals.

Step Three - Keep these out



Certain things should never be placed in your bin. No cooked vegetables, no meat, no dairy products, no diseased plants, and definitely no dog poop or cat litter, or baby's nappies. Putting these in your bin can encourage unwanted pests and can also create odor. Remember that plastics, glass and metals are not suitable for composting and should be recycled separately.

Step Four - Making Good Compost



The key to good compost lies in getting the mix right. You need to keep your Greens and Browns properly balanced. If your compost is too wet, add more Browns. If it's too dry, add some Greens. Making sure there is enough air in the mixture is also important. Adding scrunched up bits of cardboard is a simple way to create air pockets that will help keep your compost healthy. Air can also be added by mixing the contents. After approximately 6-9 months your finished compost will be ready.

Resources-

<http://www.recyclenow.com>

http://supak.com/organic_gardening/farming.htm

<http://www.earth911.org>

<http://vegweb.com/composting/>

Mad River Compost- (707) 840-WORM

Arcata recycling center- (707) 822-4321. 1380 9th St. Arcata

Campus Recycling Program

Humboldt State University

Warren House 53

Arcata CA, 95521

(707)826-4162

recycle@humboldt.edu <http://www.humboldt.edu/~recycle/Composthtml.html>

Bio-dégradable sources & supplies-

<http://www.ecowareonline.com/>

<http://www.simplybiodegradable.com/>

Composting references:

This sheet provides a comprehensive list of local composting resources. Please feel free to contact them if you have any questions, comments, or concerns!

- Mad River Compost: (707) 840-WORM.
Your compost pickup service provider.
- River Community Home- Amanda: (707) 825- 8371. 1061 Hallen Dr. Arcata.
Your onsite complex manager.
- Humboldt State University's Campus Recycling Program: (707) 826-4162.
Innovative recycling program with a great composting demonstration site located at HSU.
- Arcata Community Recycling Center: (707) 822-4321. 1380 9th St. Arcata.
The oldest community recycling center in the U.S.
- Gess Environmental LLC- Andrew: (707) 840-9610. Consulting firm working with Mad River Compost to divert your organic waste.
- California Liquid Fertilizer (CLF): 1-877-675-8600. Your food waste will go to their Aerobic Digester being constructed in Fairhaven, where it will become high quality liquid fertilizer.
- City of Arcata Environmental Services department: (707) 822-8184.
Email:eservices@arcatacityhall.org
Keeping Arcata beautiful.
- City of Arcata Resource Specialist Juli Neander: (707) 825-2151.
Good resource for general waste management information.