

The Occidental College Compost Project
In conjunction with the Environmental Stewards (ENV 246/247):
A Project Summary and Proposal

Introduction and History

The Occidental College Compost Project is a part of the Environmental Stewards program (ENV246/247), which recently completed its first full year at Occidental College. The program developed from the Eco-Oxy/ Eco-L.A. course, when, in 2002, the Council for a Livable Campus endorsed the Environmental Stewards program as the best way to continue the work begun by Eco-Oxy/Eco-L.A. The idea for the program was to have participating students serve as primary contacts on environmental topics for residence halls. In this capacity, they could serve as a liaison between the administration and the student body and support conservation efforts in the halls and around campus. To complement this work, the program called for the stewards to participate in a 2-credit course (ENV246/247) each semester that would allow them to reflect on their experience, coordinate activities, and put their research about the campus environment into the broader context of local, state, national and international environmental issues.

The overall purpose of the Environmental Stewards program is to improve the sustainability of the Occidental campus while providing training in the skills and perspectives necessary for students to become effective leaders in the environmental field.

Initial discussions with students in the fall of 2002 resulted in the following goals for the Stewards Program:

- To teach the skills of environmental leadership within the context of making Occidental a greener campus.
- To develop a model campus greening program that can be disseminated to other college campuses.
- To build supportive relationships between students that nurture their interest in environmental issues development as environmental leaders.

- To continually seek to improve the sustainability of the Occidental campus.
- To increase the environmental consciousness of Occidental students, faculty and staff.

These goals reinforce the mission of the College and its related themes and supporting principles. Specifically, the program's effort to increase campus sustainability supports the College's commitment to excellence in everything that it does. The program effectively bridges curricular and co-curricular activities and speaks to the future of students, both as alumni and citizens. The program is interdisciplinary. It examines Occidental's contributions and impacts on the surrounding community's environment and puts Occidental's work in this area into a global context. Perhaps most important, its explicit focus on leadership training contributes to the central mission of preparing students "...for leadership in an increasingly complex, interdependent, and pluralistic world." Environmental problems, including those on campus, are by their nature perhaps the best examples of a complex and interdependent world and certainly call for diverse viewpoints and voices in finding solutions.

The Compost Project is one example of the smaller group projects that the Stewards focused on in their waste reduction campaign. This project is part of a national campus ecology movement; many colleges and universities that are urban and rural, private and public, small and large, have successful compost projects. The environmental stewards have reviewed over 25 schools that have composting programs and there are many more. We have explored strategies used at other institutions as possible considerations to be implemented in Phase Three of the Project. Future considerations for the Composting Project will be described in this summary of progress and proposal, but first a summary of the benefits of composting to the college will be discussed in the subsequent section.

Benefits of Composting

The Compost Project is an overall effort to make Oxy a greener campus, which can be seen as a positive aspect and addition to the integrity of the college. The Composting Project can be highlighted to demonstrate that Oxy strives to maintain its commitment to becoming a more environmentally friendly campus. On April 20, 2001 President Ted Mitchell, signed the Talloires Declaration on behalf of the college. The Talloires declaration is a 10-point action plan outlining a commitment to environmental issues on the Occidental campus. The compost project has future benefits that fit the goals of the environmental declaration on many different levels.

On one level are the many monetary benefits of composting which include: first, decreased waste removal costs for green as well as brown waste and second, decreased costs of high quality soil used throughout Occidental's beautiful campus. The creation of a composting program will lead to a measurable reduction in the amount of bulk solid waste that Occidental College generates in the Los Angeles landfill. By decreasing waste on campus, the composting program will reduce the school's waste removal costs. Currently our solid waste collector charges by the weight and the less garbage we send to the landfill, the lower to waste removal costs. There are many cost-benefits to composting on campus, many of which are extremely difficult to quantify.

Composting on campus means keeping business and work within the college and not hiring outside organizations. Compost is created by brown and green waste from the campus and also used on the campus as a highly fertile soil for landscaping and planting.

According to Ron Seymour, Assistant Director of Services within the Facilities Department, the compost the pilot Compost Project generated is tantamount to the quality of Cottonseed meal fertilizer, which he said costs the school \$10.50 for a 50 pound bag containing 1 ½ cubic feet of fertilizer. Mr. Seymour said that he would like to use the compost created from the pilot Compost Project on the flowerbeds and other areas around campus. Using the aforementioned costs of Cottonseed meal fertilizer as a guideline, the 9 cubic feet of compost generated

by the pilot program will save the school approximately \$65. If this was done every week, for 30 weeks (approximately two semesters), this would save the college \$1,950 by using this compost instead of purchasing compost, plus transportation savings.

In 1995 and 1996 a survey was done on solid waste at Oxy. It was estimated that Oxy produces 809 tons of trash a year; 40% of it was organic (Stewards Handbook). This does not include paper, which could be used in compost, which was another 12.8% of Oxy's waste (Stewards Handbook). While this proposal does not encompass composting on such a large scale, and composting would decrease costs even on a smaller scale, it is important to keep in mind how much waste Oxy generates and how much of it is organic and potentially could be composted. According to the Stewards Handbook, in 1996 Oxy paid Bradley Landfill \$32.25/ton to haul solid waste, which would equate to average total cost of \$26,090 in 1996 and in 2003, Oxy's solid waste disposal costs had increased to \$80,000 to \$100,000 (Stewards Handbook¹). In 1998, Solid Waste Recycling (SWR) collected 14 tons of food waste per year, but from this study it is unclear if this was pre- or post- consumer food waste. Food waste is compacted in one compacting bin located behind the cafeteria (Stewards Handbook²).

This compost program would reduce the amount of green waste sent to the landfill as well. The compost program uses woodchips from facilities that otherwise would sit in a pile until they were used around campus. As of 1998, the green waste program on campus includes mulching through a chipper machine, which breaks down leaves and small branches. Green waste that isn't mulched is taken to the landfill. The College sends 40 yards of green waste to this landfill every month (Stewards Handbook³). The compost project would, in effect, reduce the amount of green waste sent to the landfill because more of the green waste could be composted and used.

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SWR is Oxy's hauler for green waste. In 1999, they charged \$29.50/ton to haul contaminated waste away or \$23/ton for clean waste. Green waste is "contaminated" if it includes stumps, limbs larger than 6" in diameter or greater than 8' long, weeds, ivy, palm, fronds, banana leaves, trash, concrete, piping, dirt of other non green waste material. In 1998 Oxy paid \$1,768.72 for contaminated waste and \$941.82 for clean. In 1998, contamination of green waste cost Occidental \$372/yr in extra hauling fees. The green waste is cleaned and grinded up and used by the city as compost, however, the reason the college discontinued purchasing compost from the city was because it usually had plastic and/or trash in it. Our compost has no trash or plastic in it and this would be certain to continue because we would only use the green waste directly from facilities and preconsumer waste from the Marketplace. In 1998, the college purchased \$1,778.87 worth of compost and also mulch, which has not been quantified in terms of cost. 36,000 lbs (16.3 tons)/yr of green waste is currently recycled (Stewards Handbook⁴).

The Compost Project achieves the goals of the Talloires Declaration on another level because it will increase environmental consciousness and education on campus and in the communities. Having classes such as the Environmental Stewards be the initiators of the project, as well as part of the student labor for the project, means that these students are learning about methods of increasing sustainability and decreasing waste on campus. This student initiated project in conjunction with various departments on campus such as Campus Dining and Facilities will enable students, faculty, and staff to practice institutional ecology. Furthermore, the education campaign that the Environmental Stewards and the Environmental Action Coalition (EAC, formerly the Environmental Club) will initiate around composting as part of an ongoing Mt. Fiji sustainability campaign will increase awareness of environmentally sustainable development for years to come. Hopefully, the success of this project will help to increase the school's acceptance of new environmental projects and

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will increase the number of environmentally responsible projects that the school undertakes.

The Composting Project is already an important part of environmental education for students on and off campus. As previously discussed, Occidental students, as part of the ENV 247- Environmental Problem Solving class, initiated the pilot project and learned much about environmental science and practical problem solving, leadership, and team building skills while working together on the project. The Composting Project gave environmental stewards the opportunity to employ outreach and organizing tactics and as such they sent out e-mails to Occidental students and wrote a newspaper article that was published in the Occidental Weekly encouraging support and participation in the project. Over twenty five students participated in phase one of the composting program, which lasted from May 10, 2004, to the end of April, and by doing so students learned how to effectively compost waste into very valuable, nutrient rich soil.

The environmental stewards connected with teachers at Delevan Drive Elementary, a local school, to teach students about environmental science through hands-on experiential learning. About forty-eight Occidental students volunteers taught earth science to a total of 125 Delevan Drive Elementary School students throughout the 2003-2004 school year. As a culmination to the garden-based education program, Occidental biology students led Delevan Dr. students on a walking nature tour of Occidental. The composting project was a highlight of the walking tour. Environmental stewards gave a mini-lesson on compost, decomposers, how compost is part of a natural cycle, and why compost is important for the earth. The students were encouraged to actively participate in the lesson through asking questions as well as touching and smelling the compost. The engagement of Occidental students and the local elementary students was very evident. The elementary students were eager to learn more about compost (especially the visible decomposers) and the Oxy student were more than happy to be sharing the composting project with the community (please see the photographs included).

These types of community connections and learning experiences will only expand in subsequent phases of the composting program.

Composting

We see the compost project as unfolding into three phases. The initial pilot program was successfully completed in the spring semester of 2004. We are now ready to move into phase two, which will hopefully begin in the fall of 2004. All three phases of the proposed project will be discussed.

Phase One

The first phase of pilot compost program was implemented during the spring of 2004. The program composted one day of pre-consumer waste from the Marketplace.⁵ On May 10, 2004, the environmental stewards collected approximately 7.5 cubic feet of pre-consumer waste, an approximate measurement calculated based upon the amount of bin space filled by the pre-consumer waste. We divided the pre-consumer waste into two bins, each which could hold a capacity of 13 cubic feet. After we added an equal amount of brown waste to each bins, the two bins were half full; therefore, we estimate that had a total amount of 7.5 cubic feet of pre-consumer waste. When the material was fully composted, it compacted into approximately one third of each container, or 5 cubic feet of compost.

This effort was coordinated with Campus Dining and Facilities. We met with Campus Dining and determined that Wednesday was the best day for the pickup of pre-consumer waste and 1:00 p.m. was the appropriate time when the prep cooks are finished preparing food for the day. There were 5 or 6 boxes filled with preconsumer waste that the campus dining staff prepared. It is estimated it took one Campus Dining employee an extra half an hour of work to prepare the preconsumer food waste. In return, Campus Dining did not have to pay tipping fees to haul this waste away.

Facilities assisted us in finding a suitable location for the compost bins, which are currently by the baseball field on upper campus. For the pilot project we hauled water and a shovel to turn the bins. The bins did not attract pests of any kind and were not did not give off a noticeable odor, according to the volunteers who turned the compost, a few students who run by the compost bins regularly, and facilities staff members, who had no complaints about the bins, pests, or odors during the pilot program. Ron Seymour frequently inspected the compost and noted that he was “quite pleased” by the pilot composting program, and particularly the quality of the compost, which will be used in the flowerbeds and other areas on campus (May 10, 2004).

It took approximately 6 weeks (around 45 days) to compost. Student volunteers turned and watered the compost every four days. We had a great deal of student support. Although, the only form of advertisement about the compost project were a few emails sent to the EAC, the Outdoor Adventure Klub, and No Bull, and there was an overwhelming response of students willing to volunteer to turn the compost and in support of composting on campus.

Phase One is considered backyard composting and therefore did not require a permit with the city of Los Angeles.

Phase Two

Our proposal for Phase Two of the compost program involves expanding the project to include regular pickup of pre-consumer waste from the Marketplace. It is recommended that Phase Two begin in fall 2004, and would involve picking up the pre-consumer waste from the Marketplace once every week. Amy Munoz, director of Hospitality Services, recommends Wednesday at 1:00 p.m. would be a convenient time to pick up the pre-consumer waste from the Marketplace. The labor needed would be someone to pick up the boxes of pre-consumer waste from Campus Dining on Wednesdays at 1:00p.m. and haul

⁵ Pre-consumer waste or brown waste is anything used in the campus dining facilities that can be composted such as fruit and vegetables and peels, vegetable soup, flowers, dry egg shells, tea leaves and bags, coffee grounds and filters, cereal, flour, rice, oatmeal, and peanut shells.

it to the compost site. Additionally, the compost would need to be turned and watered approximately every four or five days.

We have purchased eight compost bins and because of calculations based on the results of Phase One, it can be assumed that eight is an adequate number of bins to compost the amount of waste picked up one every week during the school year. We have arranged with facilities to have water at the site, as well as the shovel so that turning the compost takes less organization and will hopefully be easier. This will decrease the time it will take students to coordinate the volunteers, however recruitment will still be necessary for volunteers.

It is recommended that the Compost Project would continue to be integrated into the Environmental Stewards class, with participation from the EAC, as well as other student volunteers and alumni. The compost will be entirely student run, except for the packaging of the preconsumer waste and it may be possible to arrange with Facilities to use an electric vehicle to haul the brown waste to the compost site.

In Phase One, the compost was turned every four days. In phase two, the compost would also be turned every four days, but if there is a school holiday or other reason students cannot turn the compost, it will not significantly affect the progress of composting.

There are several types of activities, classified by the California Code of Regulations, that are excluded from normal composting permit requirements. Section 17855 of the California Code of Regulations, Section 14, states that: Within- vessel composting process activities with less than 50 cubic yard capacity are excluded. In other words, a permit would not be required for the Second Phase because we are not composting more than 50 cubic yards, or 1,350 cubic feet of compost, at one time (Dave Thompson, May 27, 2004). We will not go over this amount, because based on the amount of compost collected during Phase One of the project, we will only collect 7.5 cubic feet of pre-consumer waste per week. The pre-consumer waste will be combined with 7.5 cubic feet of green waste for a total of 15 cubic feet of non-compacted material every week. The material will be composted and ready for removal after six to

eight weeks, and thus we will only have approximately 120 cubic feet of compost at one time (15 X 8), which is 1,230 cubic feet less than the amount that would require a permit. Dave Thompson, LA Program Manager for the Solid Waste Local Enforcement division of the Environmental Affairs Department, said that, “this sounds like a great project” and was pleased to hear that the compost will be used on campus and will use pre-consumer waste prepared in our dining facility (Thompson, May 27th, 2004).

Phase Three

Phase Three involves composting all preconsumer waste generated by the campus. This phase may take advantage of the compost bins or it may take shape of one large bin or storage container, similar to Johnson State College’s system, which is a compost pile rested on a 30-by-30-foot concrete slab, which slopes toward a catchment wall where moisture runoff can pool and evaporate. The compost is not tilled, but is aerated passively by PV pipe running through its center. The passive system is efficient- and most likely cheaper than trying to turn a large amount of compost (Keniry, 1995).

Using the bins we already have and another type of bin or pile is a second option. The other type of bin would be constructed for worm composting or vermicomposting, which is only used when composting brown waste. This is similar to Cal Poly Pomona, and Berkeley’s compost programs, which use a variety of methods such as an electric mixer to turn the compost, compost bins, vermicomposting, and static piles.

The legal issues around Phase Three are still being explored and discussed with Mark Rosen and Dave Thompson of the Solid Waste Local Enforcement division of the Environmental Affairs Department. If is possible for us to design a composting structure that has a capacity of less than 50 cubic yards, or 1,350 cubic feet, and in this case, we may again be exempt from purchasing a regular permit from the City of LA. However, the College may be required to purchase a permit and maintain measurements of pH and temperature of the compost. This would be a wise investment for the College to

make to decrease the amount of waste it sends to the landfill, have a valuable resource for landscaping around campus, an educational tool, and a sign of accomplishment in our endless efforts to foster an environmentally friendly campus.

Works Cited

The Environmental Stewards Handbook (Draft) 2003

Keniry, Julian Ecodemia: Campus Environmental Stewardship at the Turn of the 21st Century (1995)