The Use of Mushrooms at Humboldt State University's Campus Center for Appropriate Technology

Prepared By:
Asa Spade,
Katherine Testa,
Jacob Brinkerhoff

Prepared For:
ENVS 411: Sustainable Campus
Humboldt State University
Fall 2006

Table of Contents

Problem Statement and Background

Problem statement

Fungi are an integral part of the ecosystem, a potential source of food and bioremediation, yet this great fifth kingdom is currently unrepresented at the Humboldt State University Campus Center for Appropriate Technology (CCAT).

Background

"The mission of CCAT is to demonstrate appropriate technology in a residential setting, to provide hands-on experiential learning opportunities to Humboldt State University and the surrounding community, to collect and disseminate information about appropriate technology, to examine the ethical and social consequences of technology, and to dispel the myth that living lightly on the earth is difficult or burdensome. CCAT is dedicated to sustainability and seeks to help others live likewise" (CCAT website). CCAT demonstrates technology that is appropriate for its location; an area in the redwoods of Northern California.

CCAT showcases technologies by sponsoring workshops and serving as a location for the exhibition of interpretive displays. CCAT provides experience and learning opportunities to 15 HSU classes. CCAT seeks to educate fellow students in particular, and the greater community at large. CCAT has a web presence and reputation that makes its information respectable and available worldwide. In educating others about mushroom cultivation, CCAT can help the community and others move toward a sustainable style of living.

Cultivation of mushrooms can be a highly beneficial sustainable practice, however it is not currently represented at CCAT. **The process of growing mushrooms at CCAT is significant because it reduces the amount of embedded energy present in food when grown onsite, mushrooms can be used to break down common household wastes through a process known as mycoremediation, growing mushrooms can be beneficial to the surrounding ecosystem, mushrooms are easy to grow, and they provide good source of vitamins and minerals.**

"Mainstream agriculture is unsustainable. The average food item in the U.S. travels 1500 to 2100 miles from farm to table. Between production and transportation, it takes up to ten calories to produce one calorie of food in the current system of industrial agriculture" (CCAT website).

One of the ways in which CCAT practices sustainable living is through the consumption of food products with the lowest total amount of embedded energy possible. Embedded energy is all of the energy and resources (including transportation) required to get an item to its final destination where it would be consumed. CCAT strives to produce as much of their residents' food on site as possible. Doing so allows residents and others to be aware of what inputs have gone into producing their food. Mushroom cultivation at CCAT would reduce the amount of food imported from outside sources.

Fungi (mushrooms) are also beneficial in that they can be used to break down organic waste products such as cardboard, wood chips, and coffee grounds through a

Doesn't mycoremediation mostly refer to cleaning up contaminated sites?

process known as mycoremediation. Fungi can be used to build soil, filter water, remove contaminants, break down waste and restore habitat. Fungi provide a vital link between the end of cycles and the beginning of new ones.

Other fungi form beneficial symbiotic relationships with plants. Fungi can be introduced near the roots of plants to stimulate plant growth by increasing the water, nitrogen and micronutrients available to their photosynthetic partners. Fungi can be used to increase the health and production of food crops.

Mushrooms are a low calorie food high in fiber and protein. Many varieties contain relatively high concentrations of such vitamins and minerals as thiamine (B_1), riboflavin (B_2), niacin (B_3), biotin (B_7), cobalamins (B_{12}) and ascorbic acid (C), iron, selenium, potassium and phosphorus. Mushrooms have been eaten by people since before recorded history. Currently many indigenous peoples eat mushrooms and mushrooms play an important role in Chinese, European, and Japanese cuisine.

CCAT is currently in the process of moving due to the construction of HSU's new BSS building. The original building in which the CCAT co-directors lived, the Buck House, was moved to a new permanent foundation. The co-directors currently reside in a building that will be torn down to make room for a garden in the spring of 2007. At that time the co-directors will move back into the Buck House.

CCAT currently has little space for the purpose of gardening. They will need soil in which to grow vegetables when the space is cleared for their garden in 2007. In the mean time they have very little arable land. CCAT is adjacent to a section of redwood forest and a small grove of young pine trees. Some hardwood trees, presumably alder, have been cut down but still remain on the site. Some or all of the Bishop Pine trees will be cut down in the near future.

Fungi have been represented at CCAT in the past, but to limited effect. In the fall of 2001 and 2005 two separate groups of students worked with CCAT to grow mushrooms. The focus of both of these groups was primarily the production of food at CCAT. The only resources of these two projects remaining after CCAT's location move are a report and website. All physical products of these projects have been consumed or destroyed or lost in the move.

In searching for similar projects done at other campuses, nothing on mushrooms specifically was found. Projects at other campuses that have received press attention are more likely to be projects with a higher budget and greater magnitude than this project.

Goals and Objectives

Problem Statement: Fungi are an integral part of the ecosystem, a potential source of food and bioremediation, yet this great fifth kingdom is currently unrepresented at the Humboldt State University Campus Center for Appropriate Technology (CCAT).

Goals:

1. Increase student and community knowledge about the benefits and methods of mushroom cultivation for food and as a means of bioremediation.
2. Grow mushrooms for the consumption of CCAT co-directors and HSU students.
3. Reduce the amount of embedded energy present in the food consumed at CCAT.
4. Increase the amount of fertile soil available for future use in CCAT gardens.
5. Create and design future projects for students to do at CCAT
6. Motivate future students and CCAT residents to continue growing and using mushrooms at CCAT.

Objectives:

1. Produce 25 pounds of edible mushrooms for CCAT co-directors and HSU students by December 15th, 2006.
2. Reduce the amount of food provided from outside sources at CCAT by 5%. by when?
3. Produce 50 pounds of fertile soil for use in CCAT's future gardens.
4. Create and design at least 5 feasible projects for CCAT members and HSU students to do in the future. These projects will apply a variety of benefits and methods of mushroom cultivation.
5. Educate and inspire enthusiasm for mushroom cultivation within 5 or more HSU students or community members.

Weighing Alternatives

Alternatives:

1. Host a mushroom workshop at CCAT
2. Administer a survey to workshop participants
3. Supply mushroom growing kits for CCAT residents
4. Create mushroom garden at CCAT
5. Create a permanent interpretive sign for CCAT mushroom garden
6. Create a stapled packet with mushroom growing information
7. Create a 3-ring binder for CCAT library
8. Inoculate logs or organic matter at CCAT with mushrooms
9. Build bunker spawn around cherry tree at CCAT
10. Produce informational tri-fold brochure about mushrooms
11. Generate a list of potential mushroom identification and cultivation books for CCAT's library
12. Update already existing informational mushroom web page
13. Teach CCAT members mushroom identification and foraging techniques

Criteria for Evaluating Alternatives

How well

1. Does alternative provides an educational opportunity to HSU students, staff and/or community members about the benefits and methods of mushroom cultivation.
2. Does alternative produce edible mushrooms for CCAT co-directors, students, staff, and/or community members?
3. Does alternative produces fertile soil for use in CCAT's gardens?
4. Is alternative affordable?
5. Can alternative be completed by the end of the semester?
6. Does alternative pertain to project's continued success and/or provide motivation for future students to continue cultivating mushrooms?

Results of Evaluation (For Matrix, refer to Appendix A. Page 12)

Alternative 1. Hosting a mushroom workshop will provide obvious educational opportunities. This alternative will produces some edibles for participants to eat and the remnants of the kits can be used as compostable soil. The workshop will take place on Nov. 29th (before the end of the semester) but mushrooms won't fruit until several weeks later. There will be some minor costs associated with hosting the workshop.

Alternative 2. Administering a survey to workshop participants will have limited benefits related to our objectives and criteria, but will help demonstrate whether objectives have been met.

Alternative 3. Supplying mushroom kits to CCAT would provide some edibles and would also create some compostable material. This alternative would be fairly costly.

Alternative 4. Creating a mushroom garden at CCAT would have obvious benefits in providing food and soil. This alternative would also lend itself to education of visitors and is fairly inexpensive.

Alternative 5. Creating a permanent interpretive sign for CCAT would have a positive educational impact, but would be too expensive given our allotted budget.

Alternative 6. Creating a staple packet with mushroom growing information would have educational benefits, would be relatively inexpensive, and would encourage continuation of mushroom cultivation at CCAT.

Alternative 7. Creating a 3- ring binder for the CCAT library, like the staple packet, would provide for education and continuation of mushroom cultivation. This alternative would also be relatively inexpensive and could be completed in a timely manner.

Alternative 8. Inoculating organic matter or logs at CCAT provides minimal educational opportunities without an interpretive sign, but it would create some edibles and possibly some beneficial soil. An interpretive sign for the inoculated matter would be an excellent future project for students and would help maintain interest in mushroom cultivation.

Alternative 9. A bunker spawn around the cherry tree at CCAT again without an interpretive sign has limited educational impact, but is good for producing edibles and excellent for creating fertile soil. There are some costs associated with this alternative, but it is within our budget.

Alternative 10. Producing a tri-fold brochure about mushrooms would be educationally beneficial and would help to maintain motivation and interest about mushroom cultivation.

Alternative 11. Generating a list of mushroom identification and cultivation books for CCAT's library would educational benefits for visitors and future co-directors to CCAT. This would be relatively easy and free of costs.

Alternative 12. Updating the already existent mushroom cultivation web page would aid in mushroom education, but is logistically difficult. There are technical hoops to jump through in order to carry out this alternative such as getting permission and access to update the page. Also, this would require html code knowledge.

Alternative 13. Teaching CCAT members cultivation and foraging techniques would be somewhat beneficial on the educational front, but would have limited benefits otherwise.

Conclusion

Based on our analysis we have elected to carry out a number of the alternatives we generated; those best matched to our objectives and constraints. The following are the alternatives that we plan to carry out: the mushroom workshop, the mushroom garden, which will combine the inoculation of some logs and developing the bunker spawn, the 3-ring binder, the staple packet, and the generation of a mushroom booklist. We eliminated the other alternatives based on their respective lack of merits.

Implementation Strategy

Note: Refer to timeline for specific intended dates.

Since this took place before the project was due, you should be describing results in a more thorough way than you write in "Conclusions and Results"

Workshop

All three members of our group, Asa, Jacob, and Katherine will host a workshop at CCAT. Here we will provide the group of workshop participants with the necessary contents to construct mushroom growing kits. The materials provided will include plastic bags, coffee grounds, straw and Oyster mushroom (*Pleurotus ostreatus*) mycelium grain spawn. Group members will instruct participants on how to assemble and care for their kits. We will also provide participants with information on growing mushrooms along with the many benefits.

The workshop will be held at 2:00 on Wednesday the 29th of November. We will discuss the basic biology of fungi and the formation of mushroom fruiting bodies. We will pasteurize straw using a barrel of water and a propane torch then lay out the straw on a clean tarp to cool off. Workshop participants will be informed of the importance of sterile culture techniques, don gloves and mix oyster grain spawn with the pasteurized straw. Each participant will pack a filter patch bag with the straw mixture and be given a packet of information on its care. About a week prior to the workshop we will run through process of the workshop and produce some mushroom kits to be used as demonstration models. Jacob and Katherine will monitor these kits and update a website with pictures. Because their kits will be a week ahead of the workshop participants' kits they will be able to demonstrate the amount of growth expected and anticipate possible problems that workshop participants might have with their kits.

One weakness of this approach is that our workshop will educate a limited, and somewhat few for that matter, number of HSU students and members of the community due to the limited amount of space that will be available in the workshop and the amount of funds available.

Mushroom Garden at CCAT

We will order a five pound bag of Garden Giant (*Stropharia rugoso-annulata*) mushroom spawn on wood chips and create a mushroom bed within the CCAT garden path area near the herb spiral. CCAT residents will remove the vegetation on a 100 square foot area, transplanting native plants such as redwood sorrel onto other spots on the CCAT grounds. Asa will obtain wood chips from a City of Arcata drop site and soak them in water. All members of our group will be involved in placing the wood chips at the garden site and sowing in the inoculated wood chips. We will provide information to the CCAT residents on the care of this garden plot and create a permanent document with this information to be kept in a file on site.

Five pounds of wood chip spawn will only be enough to inoculate a small area. Asa will attempt to create more wood chip spawn by using some of the spawn we order to seed additional wood chips before they are spread on site. It can take from six months

to two years for this species of mushroom to produce large flushes of edible mushrooms and the plot may be forgotten about if information is not passed on as future residents move in while current residents move on.

We will inoculate several alder, Victorian box, and Monterey pine logs with pearl oyster (*Pleurotus ostreatus*), Shitake (*Lentinula edodes*) and conifer coral (*Hericium abietis*) plug spawn respectively. The logs are already located and will be drilled on site. Plug spawn will be tapped into the holes and sealed with cheese wax. We will situate the logs in appropriate places on site.

Distribution of Information

The literary information that our group plans to distribute will be through a staple packet and a 3-ring binder for CCAT's library. The staple packet will be available at CCAT near the main entrance of the building (in the living room). Any interested persons may take a copy.

The 3-ring binder will be available on one of the library shelves at CCAT. Any interested persons may look through it for information on mushroom growing and the benefits of, how to search for mushrooms, any future projects involving mushrooms which can be done at CCAT or HSU (these will be recommended projects by our group members), and references for further information.

A weakness of this approach is that while this information is available to any interested persons, he or she must know that it is there before they can access it. Our group members will refer to the 3-ring binder within the contents of our informational staple packet. These staple packets will be on display to anyone who visits CCAT, along with other informational tri-fold brochures and staple packets. Visitors to CCAT will more than likely take notice of these sources.

Timeline:

August:
21st: Class begins
23rd-28th: Discuss possible problem situations
30th: Commit to problem statement

September:
6th-11th: Brainstorm and discuss goals and objectives
13th: Meet with Zach, co-director at CCAT to discuss goals and objectives
20th: Tour CCAT site, inventory possible resources available
25th-27th: Research problem background
28th: Inoculate jars of grain with oyster mushroom spawn

October:
2nd: Have problem background and statement evaluated by instructor
4th: Begin discussing possible solutions to the problem defined
9th: Review goals and objectives with instructor
11th: Meet with Zach at CCAT to discuss progress so far, barriers and strategies; order wood chip and sawdust spawn from Fungi Perfecti
18th: Choose date for mushroom cultivation workshop for publication in CCAT schedule
23rd: Review alternative selection with instructor
25th: Begin discussing monitoring and evaluation strategies
27th: Create more grain spawn jars; get wood chips from City of Arcata dump site

November:
1st: Review implementation strategies with instructor; begin putting together informational packet and binder for CCAT
3rd: Build bunker spawn at CCAT; inoculate logs at CCAT with plug spawn
5th: Wilderness survival fair at CCAT inform visitors about edible mushrooms
15th: Review monitoring and evaluation plan with instructor
18th: Inoculate final batch of grain spawn to be used at workshop
19th: Run through mock workshop to work out any problems and create mushroom kits to be used as examples for actual workshop
29th: Hold mushroom cultivation workshop at CCAT
30th: Add pictures of workshop to power point presentation

December:
4th: Present project to sustainable campus class
6th: Finalize and turn in written project
11th: Party hearty Marty

Monitoring and Evaluation

Beginning on November 15th, 2007 the three group members, Asa, Katherine, and Jacob will begin monitoring our progress using techniques described below. The main purpose of monitoring is to figure out whether or not our objectives are being met. The most significant problem that the group has encountered during evaluation is time constraint. Mushroom cultivation is a process that takes a considerable amount of time. It will be impossible for us to yield the desired amount of products by the end of this semester. We wrote our objectives without a full understanding of the amount of time it would take to produce mushrooms and soil. If we were to begin the project again we would have focused our objectives in a different way. Our goals will be met by the project we designed but the achievements will come further down the road.

The following is a description of how the group will monitor each of the 5 objectives our group has proposed for this project. The objectives are included, followed by the monitoring/evaluation technique:

Objectives:

1. Educate and inspire an enthusiasm for mushroom cultivation within 5 or more HSU students and/or community members.
2. Produce 25 pounds of edible mushrooms for CCAT co-directors and HSU students by December 15th, 2006.
3. Reduce the amount of food provided from outside sources at CCAT by 5%.
4. Produce 50 pounds of fertile soil for use in CCAT's future gardens.
5. Create and design at least 5 feasible projects for CCAT members and HSU students to do in the future. These projects will apply a variety of benefits and methods of mushroom cultivation.

Monitoring/Evaluation Technique:

Objective 1: Issue survey at the end of mushroom workshop to gauge the interest and enthusiasm of workshop goers. Specifics of the survey will include: Simplicity of techniques learned at workshop, was workshop worthwhile, and whether participants intend to continue practicing and learning about methods used in workshop.

Objective 2: Time constriction; will not be met by the end of the semester, therefore group members will rely on CCAT to monitor progress and measure finished product. The infrastructure to produce the desired mushrooms, however, will be in place by the end of the semester. It can take up to a year for mushrooms to begin to fruit from some substrates. We have little doubt that 25 pounds of mushrooms will be produced but it is difficult to predict when this will occur due to the variability of working with complex organisms and variable weather.

Objective 3: We learned that this criterion would be very difficult to measure. If CCAT members take something from the garden, they eat it directly afterward. There is no record of how much was produced. When we designed this project we thought that

there was more accounting of food consumption amounts and sources but learned that this is not the case. [Does CCAT have food budget? More research needs to be done]

Objective 4: Like mushroom fruit bodies, soil takes a great deal of time to produce. We will be placing approximately 200 pounds of wood chips onto the site. The amount of soil that these wood chips degrade into and the amount of time it take this to occur is extremely variable and difficult to measure. Much of the benefit of the degrading wood chips will come from the process of their being metabolically broken down in place. Nutrients will be released into the soil and the wood chips will eventually be completely integrated with the natural system. It would be difficult and counterproductive to attempt to separate and measure the end product.

Objective 5: A copy of these projects will be placed within the contents of the 3-ring binder. We will include a log sheet within the binder that can be signed by future users. We can gauge how useful the binder was by reviewing the log sheet from time to time. If future classes or other groups desire, they may insert reference to their own projects that may have grown from ideas that we contributed.

In summary, future CCAT residents and visitors will be encouraged to take care of the CCAT mushroom garden and continue to expand and improve the mushroom project. The garden will have interpretive display sign with basic care instructions and reference to more detailed information within the contents of the 3-ring binder. Group members will also design a calendar which will include dates and information on suggested care for the mushroom garden.

If problems should arise or reevaluation should need to be done on the project, future CCAT residents and any interested future ENVS 411 class members (or members of any similar class) will be encouraged to reevaluate. Our project will include an evaluation of our progress, successes and shortcomings. Any interested persons may use this information as a resource and reference when designing the goals, objectives and strategies of their own project. The evaluation of our project could potentially be a major focus of a future project. In addition to this, future classes could add to our 3-ring binder and use one or more of the projects we've suggested as their own.

Conclusion and Results

In the end, our group was generally satisfied with the results of our project. We solved our problem, at least for the time being. We have made an effort to ensure that the kingdom fungi will continue to be represented at the Campus Center for Appropriate Technology. Given that this class is only one semester long, the evaluation and monitoring obligation for our group will expire.

Our efforts have resulted in a mushroom garden at CCAT, the addition of information on mushroom cultivation and its benefits available at CCAT, and the designing of future projects involving mushroom at CCAT.

There are several approaches our group would have taken differently throughout this project. They include:

- Our group would have collaborated with the HSU Mycology Club to strengthen the outcome of our project. We couldn't do this is because the Club was formed while we were in the midst of our project; halfway through the semester. On October 23rd our group had already committed to the selected alternatives which we then planned to implement.
- We would have constructed our problem statement and background through consensus rather than delegating certain sections to each group member. The result would have been better communication amongst group members and a stronger statement of problem. This weakness was a result of time constraints.
- Lastly, the group feels they should have performed more research on a person to person basis instead of making assumptions based on CCAT's website. These assumptions were in regards to CCAT's method of taking inventory on the food they consume. Based on the group's experience with visiting the website, we obtained the impression that CCAT keeps a record of where all their food comes from. The group constructed their goals and objectives under the impression that this information would be available so that we could measure any changes that had occurred.

Appendix A: Weighing Alternatives Matrix

Weighing Alternatives							
		Criterion 1.	Criterion 2.	Criterion 3.	Criterion 4.	Criterion 5.	Criterion 6.
Alternative 1.		+	+	0	0	0	+
Alternative 2.		-	-	-	+	-	+
Alternative 3.		0	+	0	-	+	-
Alternative 4.		+	+	0	0	0	+
Alternative 5.		+	-	-	-	+	+
Alternative 6.		+	-	-	+	+	+
Alternative 7.		+	-	-	+	+	+
Alternative 8.		0	+	-	0	+	+
Alternative 9.		0	+	++	0	+	0
Alternative 10.		+	-	-	+	+	+
Alternative 11.		+	-	-	+	+	0
Alternative 12.		+	-	-	+	+	0
Alternative 13.		+	-	-	+	+	0

+ indicates good fit with criteria
0 indicates neutral for criteria
- indicates poor fit with criteria

Appendix B: Survey for CCAT Mushroom Workshop Participants

Survey for CCAT Mushroom Workshop Participants
Fall 2006

Please rate the following based on the following numerical code:
1: Excellent 2: Good 3: Fair 4: Poor

1) Techniques learned were clearly presented and easy to understand.
(please circle) 1 2 3 4

2) Techniques learned were easy to do.
(please circle) 1 2 3 4

3) Amount of time invested in workshop was appropriate in relation to the amount of information given and experience obtained; workshop was worthwhile.
(please circle) 1 2 3 4

4) Workshop has inspired you, the participant, to continue practicing and/or learning about methods used in workshop and mushroom cultivation in general.
(please circle) 1 2 3 4

Additional Questions:

1) What would you like to see added to this workshop?

2) What, if anything, should we have done differently?

3) Which parts were difficult to understand? Any suggestions in regards to making them easier to understand?

4) Which aspect/technique learned did you enjoy the most? Why?

Any Questions of Comments (use room on back of survey if additional writing space is needed)**:**

Thank you for Participating!

Appendix C: Results of Survey for CCAT Mushroom Workshop Participants

Survey for CCAT Mushroom Workshop Participants
Fall 2006

Please rate the following based on the following numerical code:
1: Excellent 2: Good 3: Fair 4: Poor

1) Techniques learned were clearly presented and easy to understand.
(please circle) 1 2 3 4

2) Techniques learned were easy to do.
(please circle) 1 2 3 4

3) Amount of time invested in workshop was appropriate in relation to the amount of information given and experience obtained; workshop was worthwhile.
(please circle) 1 2 3 4

4) Workshop has inspired you, the participant, to continue practicing and/or learning about methods used in workshop and mushroom cultivation in general.
(please circle) 1 2 3 4

Additional Questions:

1) What would you like to see added to this workshop?
Maybe

2) What, if anything, should we have done differently?
nothing it was Great

3) Which parts were difficult to understand? Any suggestions in regards to making them easier to understand?
NO

4) Which aspect/technique learned did you enjoy the most? Why?
how to cultivate mushrooms

Any Questions of Comments (use room on back of survey if additional writing space is needed): 65

Thank you for Participating!

Survey for CCAT Mushroom Workshop Participants
Fall 2006

Please rate the following based on the following numerical code:
1: Excellent 2: Good 3: Fair 4: Poor

1) Techniques learned were clearly presented and easy to understand.
(please circle) (1) 2 3 4

2) Techniques learned were easy to do.
(please circle) (1) 2 3 4

3) Amount of time invested in workshop was appropriate in relation to the amount of information given and experience obtained; workshop was worthwhile.
(please circle) (1) 2 3 4

4) Workshop has inspired you, the participant, to continue practicing and/or learning about methods used in workshop and mushroom cultivation in general.
(please circle) (1) 2 3 4

Additional Questions:

1) What would you like to see added to this workshop?

More species

2) What, if anything, should we have done differently?

3) Which parts were difficult to understand? Any suggestions in regards to making them easier to understand? No!

4) Which aspect/technique learned did you enjoy the most? Why?

· cultivation & culinary experience

Any Questions or Comments (use room on back of survey if additional writing space is needed)**:**

Thank you for Participating!

Survey for CCAT Mushroom Workshop Participants
Fall 2006

Please rate the following based on the following numerical code:
1: Excellent 2: Good 3: Fair 4: Poor

1) Techniques learned were clearly presented and easy to understand.
(please circle) (1) 2 3 4

2) Techniques learned were easy to do.
(please circle) (1) 2 3 4

3) Amount of time invested in workshop was appropriate in relation to the amount of information given and experience obtained; workshop was worthwhile.
(please circle) (1) 2 3 4

4) Workshop has inspired you, the participant, to continue practicing and/or learning about methods used in workshop and mushroom cultivation in general.
(please circle) (1) 2 3 4

Additional Questions:

1) What would you like to see added to this workshop?
Jars

2) What, if anything, should we have done differently?

3) Which parts were difficult to understand? Any suggestions in regards to making them easier to understand?

4) Which aspect/technique learned did you enjoy the most? Why?
Free Starter bag

Any Questions or Comments (use room on back of survey if additional writing space is needed):

Thank you for Participating!

Survey for CCAT Mushroom Workshop Participants
Fall 2006

Please rate the following based on the following numerical code:
1: Excellent 2: Good 3: Fair 4: Poor

1) Techniques learned were clearly presented and easy to understand.
(please circle) (1) 2 3 4

2) Techniques learned were easy to do.
(please circle) (1) 2 3 4

3) Amount of time invested in workshop was appropriate in relation to the amount of information given and experience obtained; workshop was worthwhile.
(please circle) (1) 2 3 4

4) Workshop has inspired you, the participant, to continue practicing and/or learning about methods used in workshop and mushroom cultivation in general.
(please circle) (1) 2 3 4

Additional Questions:

1) What would you like to see added to this workshop?
Nothing

2) What, if anything, should we have done differently?
11

3) Which parts were difficult to understand? Any suggestions in regards to making them easier to understand?
11

4) Which aspect/technique learned did you enjoy the most? Why?
How to MAKE Oyster Mushrooms

Any Questions or Comments (use room on back of survey if additional writing space is needed)**:**

Thank you for Participating!

Survey for CCAT Mushroom Workshop Participants
Fall 2006

Please rate the following based on the following numerical code:
1: Excellent 2: Good 3: Fair 4: Poor

1) Techniques learned were clearly presented and easy to understand.
(please circle) 1 2 3 4

2) Techniques learned were easy to do.
(please circle) 1 2 3 4

3) Amount of time invested in workshop was appropriate in relation to the amount of information given and experience obtained; workshop was worthwhile.
(please circle) 1 2 3 4

4) Workshop has inspired you, the participant, to continue practicing and/or learning about methods used in workshop and mushroom cultivation in general.
(please circle) 1 2 3 4

Additional Questions:

1) What would you like to see added to this workshop?

2) What, if anything, should we have done differently?
had a handout to keep us on track

3) Which parts were difficult to understand? Any suggestions in regards to making them easier to understand?
the steps

4) Which aspect/technique learned did you enjoy the most? Why?
the coffee filter & coffee medium

Any Questions or Comments (use room on back of survey if additional writing space is needed)**:**

Thank you for Participating!

Survey for CCAT Mushroom Workshop Participants
Fall 2006

Please rate the following based on the following numerical code:
1: Excellent 2: Good 3: Fair 4: Poor

1) Techniques learned were clearly presented and easy to understand.
(please circle) (1) 2 3 4

2) Techniques learned were easy to do.
(please circle) (1) 2 3 4

3) Amount of time invested in workshop was appropriate in relation to the amount of information given and experience obtained; workshop was worthwhile.
(please circle) (1) 2 3 4

4) Workshop has inspired you, the participant, to continue practicing and/or learning about methods used in workshop and mushroom cultivation in general.
(please circle) (1) 2 3 4

Additional Questions:

1) What would you like to see added to this workshop?
methods of inoculating mediums, ie oils pastes etc.

2) What, if anything, should we have done differently?
N/A

3) Which parts were difficult to understand? Any suggestions in regards to making them easier to understand?
N/A

4) Which aspect/technique learned did you enjoy the most? Why?
culturing / Agars

Any Questions or Comments (use room on back of survey if additional writing space is needed): OR
Can a variety / strain be depleted over time in turn degrading quality of fungi

Thank you for Participating!

Survey for CCAT Mushroom Workshop Participants
Fall 2006

Please rate the following based on the following numerical code:
1: Excellent 2: Good 3: Fair 4: Poor

1) Techniques learned were clearly presented and easy to understand.
(please circle) 1 (2) 3 4

2) Techniques learned were easy to do.
(please circle) (1) 2 3 4

3) Amount of time invested in workshop was appropriate in relation to the amount of information given and experience obtained; workshop was worthwhile.
(please circle) (1) 2 3 4

4) Workshop has inspired you, the participant, to continue practicing and/or learning about methods used in workshop and mushroom cultivation in general.
(please circle) (1) 2 3 4

Additional Questions:

1) What would you like to see added to this workshop?

✓

2) What, if anything, should we have done differently?

✓

3) Which parts were difficult to understand? Any suggestions in regards to making them easier to understand?

4) Which aspect/technique learned did you enjoy the most? Why?

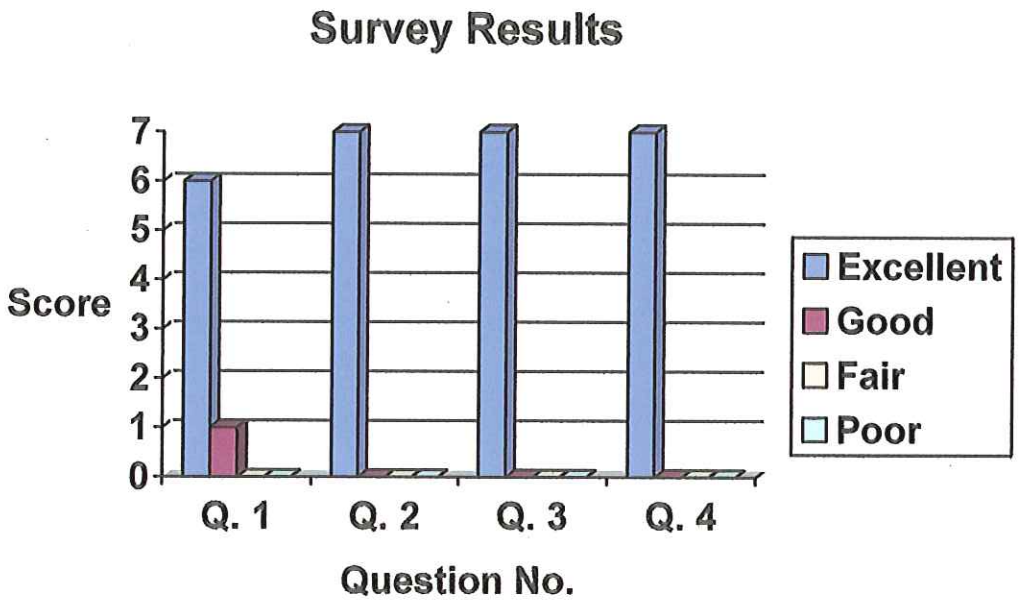
Making the kits is a great thing

Any Questions or Comments (use room on back of survey if additional writing space is needed): Very well done. Right amount of info for time. Good discussion w/ students!

Thank you for Participating!

Appendix D: Overview of CCAT Mushroom Workshop Survey Results

Graphical Results:



Data:

	Q. 1	Q. 2	Q. 3	Q. 4
Excellent	6	7	7	7
Good 1	0	0	0	0
Fair 0	0	0	0	0
Poor 0	0	0	0	0