
**ONLINE LEARNING IS EQUALLY AS EFFECTIVE AS TRADITIONAL
CLASSROOM TRAINING FOR MASTER GARDENERS.**

**A PLAN B PROJECT
SUBMITTED TO THE FACULTY OF THE GRADUATE SCHOOL
OF THE UNIVERSITY OF MINNESOTA
BY**

KAREN JOY JEANNETTE

**IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
MASTER OF SCIENCE/HORTICULTURE**

JANUARY 2001

**ONLINE LEARNING IS EQUALLY AS EFFECTIVE AS TRADITIONAL
CLASSROOM TRAINING FOR MASTER GARDENERS.**

**A PLAN B PROJECT
SUBMITTED TO THE FACULTY OF THE GRADUATE SCHOOL
OF THE UNIVERSITY OF MINNESOTA
BY**

KAREN JOY JEANNETTE

**IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
MASTER OF SCIENCE/HORTICULTURE**

JANUARY 2001

Acknowledgements

I would like to thank Mary Meyer for developing and implementing an outstanding online Master Gardener course, suggesting this topic for a thesis project, providing numerous opportunities to learn about teaching horticulture, and for her advice and guidance throughout my Master's program.

I would like to thank committee members Billie Wahlstrom and Emily Hoover for their many suggestions and insight.

I would like to thank the Master Gardeners who participated in this study, without their cooperation this study would not have been possible.

I would like to thank my parents for providing me with a foundation of faith that kept me grounded through many challenges, for their love, support, and encouragement.

Finally, I would like to thank my best friend and husband for his support, encouragement, thoughtfulness, and patience during the last two and a half years.

TABLE OF CONTENTS

I. Online Learning is Equally as Effective as Traditional Classroom Training for Master Gardeners.....	1
A. Summary.....	1
B. Literature Cited.....	15
II. Appendix.....	28
A. Surveys with paired data.....	29
B. Surveys with unpaired data.....	57
C. Online modules.....	65

Online Learning is Equally as Effective as Traditional Classroom Training for Master Gardeners.

Karen J. Jeannette and Mary Hockenberry Meyer

Additional index words. *Internet, distance education, technology, discussion list, chat room, email, extension teaching.*

Summary. The effectiveness of Internet or online training was compared to traditional classroom training in the Master Gardener Core Course/Horticulture 1003 at the University of Minnesota. Overall horticultural knowledge was significantly greater for both groups in post-test results, and there was no significant difference in horticultural knowledge between the two groups. Online learners did not perceive the lack of instructor face-to-face interaction to be as important as did classroom participants. Online learners also placed a greater value on flexibility of class time and no commuting than did the classroom. Each group spent about 75 hours on the class. However, 20% of classroom participants' time was spent on commuting. Online training was an effective method for teaching Master Gardeners in this study.

Since its inception in 1977, the University of Minnesota Extension Service Master Gardener (MG) program has trained over 4,500 people. Over 2,000 Master Gardeners are actively volunteering in Minnesota, by providing horticultural education to the public (Meyer and Hanchek, 1997). The current demand for training is very high, but providing consistent and high quality training throughout the state is expensive, time consuming, and inefficient. Each year program administrators attempt to reach as many people as possible by selecting different training locations throughout the state.

By 1996, expanded Internet access across Minnesota made the possibility of developing an online class for MG training a promising idea. Many university teachers supplement their students' inclass experience with materials from the Internet, but few teach an entire class online. Boldt and Gustavson (1998) found high costs associated with developing online classes, lack of rewards for faculty using the Internet, and concerns about the online teaching benefits partially to blame for this limited use.

Research on technology enhanced learning suggests that courses taught at a distance are successful. Stack (1997) found MG training via interactive television (ITV) to be just as effective as traditional classroom learning. Lippert et al. (2000) found that 55% of county Extension agents who were offered Internet in-service training thought it provided a learning experience as effective as a face-to-face class. The vast majority of the literature reports that distance education using interactive media can be just as effective as traditional education when the curriculum is well planned and task-oriented, and there are ample opportunities for students to receive feedback to acknowledge personal success (Verduin and Clark, 1991). Effectiveness of distance education is further enhanced when a realistic classroom atmosphere is emulated by fully exploiting the interactive nature of the media, and by emphasizing teacher-student and student-student interactions (Moore et al., 1990; Batey and Cowell, 1986). The MG course appeared to be appropriate for distance delivery, not only due to the high demand for training, but also because the majority of MG's tend to be older, well educated, and highly motivated (Schrock et. al., 1999; Rohs and Westerfield, 1996), characteristics of successful distance education participants (Schlosser & Anderson, 1994; Bernt and Bugbee, 1993; Wilkes and Burnham, 1991).

The Internet has many teaching resources that are still being developed. The most noticeable difference is that most Internet communication is asynchronous, with no face-to-face contact. For this reason, instructors and students assume online learning is alienating. Egan et al. (1991) reported that students in learning groups felt their learning experience via television was a "real" class even though their instructor was not physically present.

Bonk and Cummings (1998) propose that rather than distribute all information via lecture, instructors should use the vast resources available on the world wide web, which may be far richer in content than just using a textbook or lecture. They offer guidelines and suggestions for designing and teaching an online course including: using a facilitator rather than a lecturer; providing students immediate feedback on their assignments and quizzes, using public and private forms of feedback to establish a safe environment; and taking advantage of the wide-resources available on the world wide web, rather than simply posting lecture notes or text from a book. Additionally, an online class, with its versatility of information and communication tools, should allow students to capitalize on their individual strengths, while at the same time providing clear expectations and prompt task structuring (Bonk and Cummings, 1998; Nelson, 1998).

The purpose of this study was to determine if online students learned just as much as classroom students, and their level of satisfaction with this new type of learning.

Materials and Methods

In 1996, the Online University of Minnesota MG Core Course was developed into twelve modules each with a list of objectives and tasks for students to complete. A sample of one module, Living with Wildlife, is shown in Figure 1. In 1998, the course was moved to the software program, WebCT 1.3 (WebCT, Inc., Lynnfield, MA).

In 2000, classroom MG training sessions were offered in Brainerd, Litchfield, and Rochester, Minnesota and online (Table 1). In most cases, both online and classroom students were taught by the same instructors. Students in both classes received the same textbook and binder of extension publications. In the classroom, course content was delivered primarily by 48 hours of face-to-face lectures over 4-5 weeks. The online class

students completed a list of assigned tasks (Figure 1) by subject over 10 weeks. The online class placed emphasis on the instructor as a *facilitator* rather than a *lecturer*.

An email discussion list, Mailman (Mailman Software, Boston, MA) where email messages are posted for a group at one address, was the main form of communication for the online course. Instructors facilitated discussion sessions by posting questions for students to respond through the use of an email discussion list.

Because of the asynchronous nature of the email discussion list, instructors were able to post discussion questions several times throughout the week and students could respond at their convenience. Additionally, a voluntary chat room, an electronic space that allows for synchronous group communication, provided additional opportunities for group discussion.

To measure learning, all online students and a random sample of classroom students were given a closed book pre- and post-test consisting of 30 horticulture questions. Students in the online class received their pre-test and post-test by mail and were asked to return the tests as soon as possible, or within one week. Follow-up tests were sent to online students who had not responded within two weeks of the original mailing. Classroom students were asked to complete the pre-test the first day of class and the post-test during the last day of class.

Additional questions, modified from Ward and Newlands (1996) determined the amount of time students spent on the course, their learning preferences, advantages and disadvantages of online and classroom learning, course satisfaction, and student demographics. Students were asked to rate the importance of certain advantages and disadvantages of both classes on a five-point Likert scale, with possible responses on a

continuum from “not important” to “important.” Scores were compiled and subjected to a one-way analysis of variance, (SPSS, 1998).

Results and Discussion

One hundred seventeen matching pre and post-tests were collected (Table 1). The age distribution in this study (Table 2) is consistent with other MG programs where the majority of students were age 40 and over (Schrock et al., 1999; Rohs and Westerfield, 1996). MG trainees in this survey were highly educated, the largest proportion of students held college degrees: 56% and 62% of the classroom and online students respectively had bachelor or graduate degrees.

A significant gain from pre-test to post-test scores resulted for both classes, indicating students learned horticulture (Table 3). There was no significant difference between groups mean pre and post-test scores, indicated both groups' horticulture knowledge was initially similar and both groups learned a similar amount of horticultural by the end of the course. Students in both classes had fairly high knowledge entering class, answering 58 or 61 percent of the horticulture questions correctly in the classroom and online, respectively.

Differences occurred between groups on post-test Question 6: *the amount of sand, silt, and clay in a soil refers to:* was more difficult for all students **even after** they received the training. Here, post-test scores decreased by 38 or 22 percent for the classroom and online participants, respectively, indicating that students were still confused about this concept. Soil structure and texture are often difficult for students. These findings suggest that reinforcement of these concepts in both classes is needed.

Questions that varied significantly between online and in class are listed in Table

4. Classroom students scored significantly better on Question 7: *Failure of young fruit trees to bear fruit is related to a particular growth stage known as juvenility*. The textbook contains this information, but it appears that it may have been stressed by the lecture and not in the learning resources for the online students. Online students scored significantly higher on the pre-test question 8: *Which of the following series of plants would be good for a rotation plan for disease reduction?* and question 12: *What do springtails, fungus gnats, and slugs have in common?* However, post-test results for these questions indicated no significant differences between the groups, it appeared that both classes learned material equally as well. Question 17: *Leaving lawn clippings after mowing can account for:* showed a large difference between the classroom and online students. Only 61% of the online students learned the answer, compared to 98% of classroom students. Landscaping and turfgrass are taught as two different units in the classroom, but are combined into one unit in the online class. Although other turfgrass questions on the pre-test and post-test reveal that online and classroom scores are similar, questions 17 suggests that two separate modules for landscaping and turfgrass are needed.

Classroom students indicated that they spent an average of 9-12 hours in addition to the 48 hours of inclass time for a total of 60 hours over four weeks of class (Table 5). The online students indicated they spent an average of 70-80 hours on the course, over a ten-week period. Additionally, 80% of classroom students and 85% of online students rated the workload of the course as being "just right", data not shown.

Online students worked at their own pace, spending more or less time on topics of their choice. One student said, "In a face-to-face class I couldn't ask the speaker to back up if I drifted off." Another student commented, "I found that I investigated more on a web site than was required during a module which benefited me in two ways: I discovered information that I will probably need at some point and I learned how to find information faster." Other students spent more time participating in the email discussion list and chat room sessions. As with a classroom group discussion, participation is optional so some of the online students participated in the discussion session while others did not. Students that spent time in the chat room were often the same students that spent time involved in online discussion list sessions.

Classroom students reported an average driving distance of 26 to 40 miles, or 1.25 hours or 15 hours for the entire course (Table 5). Interestingly, online students reported the average distance they would be willing to drive was also 26 to 40 miles. All activities combined, the average classroom student spent a total of 72 to 75 hours commuting, attending class, and studying, whereas the average online student spent 70 to 80 hours studying or working on the class. Forty-eight percent of online students spent 9 or more hours on the course per week, slightly above the class average (Table 6). Thus, online students reportedly spending 16.5 hr. or 22 % more time on the course.

One online student said, "Reading the text, looking at brochures – all the web sites have probably given those of us in this class a broader range of materials, more reinforcement of the text, and most certainly, a lot of valuable resources for helping others with their plant problems."

The two groups' views were sometimes shared on the pre-test, but were significantly different from each other on the post-test in response to learning questions, Table 7. Not surprisingly, online students tended to favor elements of an online class, and classroom students tended to favor traditional classroom learning elements.

When asked how important the advantage of a structured learning environment was in a face-to-face class, classroom students thought it was very important on both the pre-test and post-test. Online students responded much differently, showing only a slight to moderate advantage on both the pre-test and post-test results (Table 7).

When asked how important the advantage of face-to-face contact was with the instructor, neither class denied that this was an important advantage in pre-test data. By the post-test, however, classroom students thought face-to-face contact to be a significantly more important advantage, while the online students thought this contact to be significantly less important (Table 7).

When asked how important the advantages of having a greater choice of when to study and not having to drive or spend commuting time in an online class, the classroom students saw these as slight advantages on the pre-test and the online students saw these as very important. By the post-test, classroom students rated these advantages as moderately important, indicating that they thought these time factors were more important advantages than they originally had thought. However, they still didn't rate these advantages as highly as online students (Table 7).

Classroom and online students perceived the lack of flexibility and the task of driving to and from class as a disadvantage. Classroom students perceived these as being moderately unimportant to slightly important in pre-test data, but changed their view

from being moderately to not an important disadvantage on the post-test; where as, online students thought that these were moderately important disadvantages at the beginning and even more so on post-test (Table 7). The issue of time and distance plays a role in how students perceive each type of class. Students who can take the classroom course find less advantages in taking the course online. Students that are constrained by time and distance issues find the online class a great opportunity and are more enthusiastic about taking the course online.

Classroom and online students didn't perceive technical frustrations, (hardware and software issues), as much of a problem. On the pre-test, both the classroom and online students thought technical frustrations would be a moderately important disadvantage (Table 7). Surprisingly, the post-test showed that online students didn't find this to be a bigger disadvantage, but classroom students, who hadn't even taken the course over the Internet did feel this would be more of a disadvantage, (which may explain why they took the class in the traditional classroom in the first place). Ward and Newlands (1998) indicated students rated technical frustration as high. Technical frustrations that stem from dealing with the online content or system crashes are important issues that can distract student learning. The MG course has created several online hyperlinks that provide tools for aiding students in understanding technical aspects of the course and their computers.

On the pre-test, both classroom and online students rated the loss of contact with the instructor in an online class as a slightly important disadvantage. The post-test revealed that classroom students increased their rating of loss of contact with the instructor as greater disadvantage, while online students continued to perceive this

disadvantage as only slightly important (Table 7). These differences suggest that classroom students thought the inclass contact with the instructor was necessary for training, while the online students were able to learn with less instructor involvement.

Both groups rated "an alienating learning experience" of an online class, as a slightly important disadvantage on the pre-test. However, the online students thought this was less of a disadvantage on the post-test, while the classroom students thought that taking a class online would be fairly alienating, and thus a large disadvantage (Table 7).

Classroom students may have reacted this way because they really enjoyed the interaction they had with the instructors and thought an Internet class would not give them the same opportunity. The responses of online students may be interpreted in two ways. Even though learning online may have been perceived as an alienating learning experience, the students weren't as concerned about being connected to the class as a community.

Students may have preferred to do their work with little interruption. However, many online students reported they were able to network and form an online community.

Students commented on how surprised they were that communication between with the instructors and other students seemed personable, despite the fact that they never had face-to-face contact with either. One student said, "I was quite concerned about trying to learn this way...It is still a little weird I guess, but I do feel that it is a lot more personal than I could have guessed. The instructors have been very helpful. There was probably a lot more communication between students than there would have been in a classroom setting. Everyone would be in a hurry to get traveling after class."

Online MG students were also positive about the advantage of being able to take the training and become a MG no matter how far they were from the training site. One

student commented, "I can not tell you how wonderful it is to take the Internet class. Without this opportunity I wouldn't have been able to take the training!" In addition, others really enjoyed working on their own and were excited about using a new medium to research and learn about horticulture. They felt that taking the course this way provided them with improved technical research skills.

Overall student perceptions of the online class were favorable. Wards and Newlands (1996) substituted one quarter of undergraduate economics classroom lectures with online materials, reported that students rated disadvantages of an online class, such as the loss of contact with the instructor and having an alienating learning experience to be more important than this study. Demographics, familiarity with computers, subject matter, differences in course content and layouts, and a wide-array of other factors may account for these differences.

Online communication tools

Eighty nine percent of the online students ranked their satisfaction with email as good or very good. Most students were familiar with this communication tool before the class began. Bonk and Cummings (1998) suggest that web-based courses should establish a safe environment, while also using public and private forms of feedback. Email served as the primary method of private or personalized feedback for students. Therefore, the familiarity students have with using email combined with the opportunity for private instructor feedback seems to make satisfaction with using email quite high, especially when email messages are answered in a prompt manner.

All online students were subscribed to the email discussion list, but 11% never posted a message, leaving 89% who actively used the email discussion list. Sixty-five

percent rated their satisfaction with this communication tool as good or very good.

Complaints associated with the email discussion list were usually related to getting too many messages, similar to other reports (VanVranken and Cowgill, 1996). Some students felt that it was inappropriate to ask personal learning questions over the email discussion list, rather than sending a personal email to an instructor. However, other students felt that sharing questions was a valuable learning experience. After discussion between students about whether or not there were too many messages being sent over the email discussion list, one student made an interesting point, "An up-side to many emails is that they have created an atmosphere that there are real students out there in my "class". It's been great to meet some of you!"

The chat room, the only source of synchronous communication, functioned at two different times each week, averaging ten to twenty students in attendance per time. Smaller chat groups tended to encourage more participation from every person. The sessions were held so students could ask any outstanding questions concerning the weekly units, but a portion of the chat session was used to discuss other important topics related to the unit or to simulate plant diagnostic situations that they may encounter while volunteering. Eighty seven percent of students said they had used the chat room at least once during the course and 63% rated their satisfaction with the use of this tool as good or very good. When chat room groups were larger in the online class, fewer students actively initiated questions and responses, quite the opposite of smaller group discussions. In a distance ITV course, Egan et al. (1991) reported students working in smaller learning groups felt there was a sense of community, were less likely to drop out, and that smaller groups stimulated active discussions. For students who weren't able to

attend chat room sessions, a taped log of the chat room, was sent via email the following day. Other studies have found less student satisfaction with using chat rooms (Paparozzi and Williams, 2000).

Conclusion

The results of this study suggest that online learning is just as effective as classroom learning for MG training. Other studies have found similar findings using ITV (Stack, 1997; Warmond and Schrock, 1999), suggesting that distance education is an appropriate way to educate MGs. Differences between online and classroom groups should be noted. The information students learn is often reflected in the way information is organized, presented, and emphasized in each unit and can be seen where students have similar pre-test scores on a specific question, but have significantly different post-test scores. These findings stress *it is not necessarily the method used to deliver the information as the way in which material is organized, presented, and emphasized that creates an effective learning environment.*

Classroom and online students also show distinct differences in attitudes toward the course. This study and Batey and Cowell (1986) indicate that self-motivated students appear to learn well through distance education. However, Wilkes and Burnham (1991) report satisfaction in using electronic education is likely to be attributed to external factors. External factors such as time and energy put forth for development and instruction, and the clarity in which information is provided. If motivation is an essential key to learning and external factors are the key to satisfaction with a learner, then motivated students taking a well organized and presented class, should do well and find the experience satisfying. The results of this study indicate classroom students are highly

motivated to take the course in the classroom, while online students are highly motivated to take the course online. Students in both classes did equally as well on the post-tests and rated their satisfaction with their class as fairly high, indicating that either method is appropriate for teaching MGs.

Future evaluations monitoring student proficiency may provide insight as to what pace of learning is appropriate for online learners, while also providing information about the rate people are becoming computer literate. Additionally, knowing what types of computers, operating systems, and other software students commonly use can provide valuable information too ensure that instructional technologies are in synch with students' computers and computer literacy levels.

Online students are required to actively access the course materials and search for responses in online site visits and by reading the text. At the end of the course, several online students mentioned how confident they had become in finding reliable reference information over the web. Classroom students, however appear to learn primarily by listening to lectures, which requires less active participation in looking for information.

Flexibility and convenience of online learning are major advantages. As one student said, "If it weren't for the Internet, I do not know when I could have taken this class." Although designing, coordinating, and administering the program may be time consuming initially, the benefits, according to participants, make an online course well worth the investment.

Literature Cited

- Batey, A. and R.N Cowell. 1986. Distance education: an overview. Northwest Regional Educational Laboratory. Portland, OR.
- Bonk, C. J. and J.A.Cummings. 1998. A dozen recommendations for placing the student at the centre of web-based learning. Ed. Media Intl. 25: 82-89.
- Bernt, F.L. and A. C. Bugbee. 1993. Study practices and attitudes related to academic success in a distance learning programme. Dist. Ed. 14: 97-112.
- Boldt, D.J., and L. V. Gustafson. 1998. Integrating the Internet in the classroom: Examples from Economics. Col. Stu. J. 32: 405-415.
- Egan, M.W., J. Sebastian, and M.Welch.1991. Effective television teaching: Perceptions of those who count most...distance learners. 17-20 March 1991. Proc. of the Rural Educ. Symp., Nashville, TN.
- Lippert, R., O. Plank., and R. Radhakrishna. 2000. Beyond Perception: A pretest and posttest evaluation of a regional internet extension training. Journal of Extension. 38. 11November 2000<<http://www.joe.org/joe/2000april/a2.html>>
- Meyer, M.H. and A. M. Hanchek. 1997. Master Gardener training costs and payback in volunteer hours. HortTechnology. 7: 368-370.
- Moore, M.G. and M. M. Thompson, A. B. Quigley, G. C. Clark, and G. G. Goff. 1990. The effects of distance learning: A summary of literature. ACSDE. College of Ed. Penn State. Univ. Park, PA.
- Nelson, G. 1998. Internet/web-based instruction and multiple intelligences. Educ. Media Intl. 35: 90-94.
- Paparozzi, E.T and K.A. Williams. 2000. Using chat rooms in a plant nutrition course: Bane or boon? HortTechnology. 10: 280-282.
- Rohs, F.R. and R.R. Westerfield. 1996. Factors influencing volunteering in the Master Gardener program. HortTechnology. 6: 281-285.
- Stack, L.B. 1997. Interactive television delivers Master Gardener training effectively. HortTechnology. 7: 357-359.
- Schlosser, C.A., and M. I. Anderson. 1994. Distance education: A review of the literature. Iowa Dist. Educ. Alliance, Iowa State Univ., Ames, IA.

Schrock, D.S, M. Meyer, P. Ascher, and M. Snyder. 1999. Missouri Master Gardener demographics. *Journal of Extension*. 37. 4 November 1999
<<http://www.joe.org/joe/1999october/rb4.html>>

VanVranken, R.W. and W.P. Cowgill. 1996. Using electronic-mail discussion groups on the Internet to enhance communication in specific commodity groups. *HortTechnology*. 6: 318-324.

Verduin, J.R. and T. A. Clark. 1991. *Distance education: The foundations of effective practice*. Jossey-Bass. San Francisco, CA.

Ward, M. and D. Newlands. 1998. Use of the web in undergraduate teaching. *Comp. and Ed.* 31: 171-184.

Warmond, M. and D. Schrock. 1999. Clientele perceptions of Master Gardener training delivered via interactive television versus face to face. *HortTech*. 9: 116-121.

Wilkes, W.C. and B.R. Burnham. 1991. Adult learner motivations and electronic distance education. *Amer. J. of Dist. Educ.* 5: 43-50.

Figure 1: Living with Wildlife, an Example of One Module of the MG Online Course.

Living with Wildlife

Objectives

1. Understand the biology and habitat requirements of urban wildlife.
2. Recognize various types of wildlife and their damage.
3. Become aware of solutions that may help to prevent or reduce wildlife damage.
4. Help others in effectively dealing with animal related problems.

Tasks

1. Read the section on Living with Wildlife in the Core Course text and binder of Extension publications.
2. Review the Living with Wildlife slides.
3. Visit the following sites and submit your answers to the questions using the online assignment form.

Visit this Ohio State Extension Service Factsheet about Controlling Rabbits in the Landscape.

- Which is the BEST way to control rabbits?
 - a. Moth balls and dial soap
 - b. Have-a-heart traps
 - c. Protective netting over top of plants
 - d. Habitat modification and exclusion techniques

The Minnesota DNR is always a good source to turn to for current information regarding wildlife. Take a look at the nuisance animal section of the MN DNR site. Pay special attention to the following links: "Taking a Nuisance Animal" and "Woodchucks", then answer the following questions.

- A nuisance animal normally protected by MN statute can be taken without license or permit if they are doing damage and if a conservation officer is called within 24 hours of the "taking".
 - a. true
 - b. false
- Which of the following methods is NOT legal for controlling woodchucks?
 - a. live trapping
 - b. poisons

- c. shooting or hunting where permissible by law
- d. none of the above

The [Deer Damage and Control](#) site at the University of Connecticut is a good resource for understanding the life history and habits of deer even though this site deals with a different U.S. region. It discusses many different ways to attempt to prevent deer from eating your favorite plants. [Rhode Island's Sustainable Plants](#) site lists plants deer do not like. At the link, scroll down to Appendix 2 then click on the list of Deer Resistant Plants.

- Which is the BEST long term way to control deer?
 - a. Moth balls and dial soap
 - b. Predator manure scattered around plants
 - c. Protective netting over top of plants
 - d. Habitat modification and exclusion techniques

Northwest Gardening, a gardening television series out of Oregon State University has a [Sights and Sounds](#) page that includes a video clip. The video clip is about deer damage. See the instructions for downloading the clip and then rate your experience with this clip in the online assignment form.

Instructions for downloading clip

Your browser should prompt you to download QuickTime(computer video software) if you do not already have it on your computer. Once you have found the sights and sounds page, scroll down and click on video clip #103 so you can see the video. Depending on the speed of your modem, it may take awhile to download. You may want to read part of the core course text book while you're waiting.

- Please rate this method of online learning by choosing 1 answer that best describes how you feel. If you choose the last answer (other), please email the TA and mention why you chose this.
 - a. I liked watching the clip
 - b. I liked watching the clip and would like to see more video clips throughout this course.
 - c. I watched, but the tech problems interfered with learning. Couldn't hear it or see it, poor quality.
 - d. I was unable to watch the video, don't know why.
 - e. other

Here is another video clip taken from the University of Wisconsin's Backyard Wildlife. [Rabbit damage](#) is a familiar problem with many homeowners. You may watch this video clip using the same directions as the bird damage video.

The University of Nebraska has published a large three ring binder with wildlife information. Many county Extension offices have this publication and Master Gardeners should become familiar with it. View some of these publications online at the [University of Nebraska Extension Site](#). Many of these publications are great resources and are similar to the ones in your maroon binder.

- Which of the following about skunks is NOT true:
 - a. skunks may leave small holes in the ground where they've fed
 - b. skunks are nocturnal
 - c. skunks feed only on plant material
 - d. skunks can carry rabies

Other useful wildlife resources

The [Extension Forestry](#) pages from North Carolina State University contain a wealth of information on wildlife management. Enter on the glossary page and review these terms. Twenty-five other publications about the most common types of wildlife are listed at the end of the glossary. This site is concerned with increasing wildlife--not limiting it. In the case of hummingbirds and butterflies, most people are happy to see these, but not so for the deer and rabbits!! This is a good resource for further information.

This Minnesota Extension site provides information for planning for wildlife, managing wildlife, and enhancing wildlife. Visit the [Managing Your Land for Wildlife](#) site.

4. If possible, watch the University of Wisconsin Extension Service video "Backyard Wildlife". It is a good resource for additional training for this online class. Contact your county Extension office to borrow the video.
5. Participate in the email discussion this week.
6. Take the [Living with Wildlife Quiz](#).
7. Fill out the [Living with Wildlife Feedback Form](#).

© 2000, Regents of the University of Minnesota and the Department of Horticultural Science. All rights reserved.



Table 1. Total number of surveys used to measure learning online and in the classroom, Minnesota MG Course, 2000.

Location	Distributed	Completed	%
Brainerd	30	25	83
Litchfield	26	23	88
Rochester	18	15	83
Online	67	54	81
Total	141	117	84

Table 2. Demographic information of participants in online and inclass Minnesota Master Gardener training, 2000.

Variable	Responses(%) ^z			
	Brainerd	Litchfield	Rochester	Online
Gender				
Female	68	70	80	81
Male	24	13	13	15
Age				
18 -25	0	0	7	4
26 -35	4	13	7	11
36 - 45	16	17	33	30
46 - 60	56	52	27	46
60+	16	13	27	5
Education level completed				
High school diploma	12	13	20	17
Vocational/technical degree	28	17	27	20
Bachelor's degree	32	44	33	30
Graduate degree	20	17	13	32

^z Not all participants answered all questions

Table 3. Mean percentage of correct responses for horticulture questions taken by classroom and online students in the Minnesota Master Gardener Core Course.^z

Questions		Correct Responses (%)			
		Pre-test		Post-test	
		Classroom	Online	Classroom	Online
1	Food manufactured in the leaves moves to the roots through the:	24	33	65	59
2	A perfect flower has:	71	80	86	96
3	The metabolic process where a plant uses carbohydrates produced during photosynthesis for growth is known as:	13	20	64	67
4	Working garden soils when very wet destroys soil:	49	50	67	76
5	Most soil nutrients needed for plant growth are most available in a soil range of:	83	76	97	100
6	The amount of sand, silt, and clay in a soil refers to:	65	48	27	26
7	Failure of young fruit trees to bear fruit is related to a particular growth stage known as juvenility.	60	54	81**	63**
8	Which of the following series of plants would be good for a rotation plan for disease reduction?	57**	82**	84	96
9	The purpose of mulch in the vegetable garden is to:	89	82	98	98
10	Insects with piercing -sucking mouth parts cause damage by:	84	83	94	87
11	The best time to control a caterpillar defoliator is:	22	30	60	33
12	What do springtails, fungus gnats, and slugs have in common?	44**	70**	71	87
13	Powdery mildews are easy to recognize by:	94	89	100	96
14	Viral diseases are spread primarily by:	27	32	38	35
15	To help prevent oak wilt disease in Minnesota DO NOT PRUNE oaks in:	48	43	83	83
16	If a homeowner decides on fertilizing their lawn once a year, which is the best time to fertilize?	44	52	76	80
17	Leaving lawn clippings after mowing can account for:	40	41	98**	61**
18	A person wishing to establish a lawn in a sunny area with low maintenance should select:	33	30	57	50
19	The MOST limiting factor in growing indoor plants in Minnesota is:	83	96	98	98
20	When is the best time to fertilize a houseplant?	62	52	95	96
21	Annual and perennial flowers have different needs, such as:	81	83	86	85
22	Winter mulch should be applied:	52	43	76	72
23	Which should NOT be included for hardening annuals prior to planting into the garden?	56	57	14**	70**
24	The BEST way to reduce animal pest problems is to:	60	61	95	100
25	Moles primarily feed on:	16	24	64	69
26	The reentry statement on a pesticide label states how much time must pass before:	38	44	89	98
27	You should read the pesticide label before you:	94	96	94	98

28	A good evergreen for hedges in Minnesota is:	83	80	89	87
29	Renewal pruning is accomplished for older or overgrown shrubs by:	73	72	86	85
30	Shigo indicates that trees form four walls of barriers to disease entering around a wound. Of all the walls, the last wall or barrier to form is the strongest disease barrier, but the weakest structurally.	49	57	67	67
Grand Mean:		58 ^{aY}	61 ^a	79 ^b	80 ^b

^z Pre-test or post-test responses that were ** significantly different at P=.01.

^y Grand mean followed by different letters are significant at p=.01

Table 4. Horticulture questions with significantly different responses between classroom and online students.^z

Questions	Correct Responses (%)			
	Pre-test		Post-test	
	Classroom	Online	Classroom	Online
Failure of young fruit trees to bear fruit is related to a particular growth stage known as juvenility.	60	54	81**	63**
Which of the following series of plants would be good for a rotation plan for disease reduction?	57**	82**	84	96
What do springtails, fungus gnats, and slugs have in common?	44**	70**	71	87
Leaving lawn clippings after mowing can account for:	40	41	98**	61**
Which should NOT be included for hardening annuals prior to planting into the garden?	56	57	14**	70**

^z ** are significantly different at P=.01

Table 5. Time spent on course activities by students in the Minnesota MG course.

Activity	Average Total Hours	
	Classroom	Online
Driving	15	0
In class time	48	0
Studying	9 - 12	70 - 80
Total	72 - 75	70 - 80

Table 6. Average number of hours spent each week by students in the online MG Course, 2000.

Hours	Participants (%)
2 - 4	8
5 - 6	16
7 - 8	29
9 - 10	16
11 - 12	32
Mean Range	7 - 8

Table 7. Student perceptions regarding advantages and disadvantages of classroom and online classes.

Questions	Mean ^z			
	Pre-test		Post-test	
	Classroom	Online	Classroom	Online
What advantages of a face-to-face class do you perceive as important?				
Structured learning environment (where instructor/class provides the tempo for assignments and tasks)	3.8** ^y	3.0**	4.2**	2.6**
Face-to-face interaction with the instructor	4.1	3.8	4.5**	3.5**
What advantages of an Internet class do you perceive as important?				
Greater choice of when to study (you can access the course anytime, day or night)	3.2**	4.7**	3.8**	4.7**
No driving or commuting time	3.0**	4.8**	4.0**	4.8**
What disadvantages of a face-to-face class do you perceive as important?				
Driving/commuting time to get to class	2.7**	4.1**	3.0**	4.2**
Class time is not flexible	2.8**	4.4**	3.3**	4.6**
What disadvantages of an Internet class do you perceive as important?				
Technical frustrations (understanding the computer and programs)	3.0	2.6	3.6**	2.8**
Loss of contact with instructor	3.3	3.2	4.2**	3.1**
An alienating learning experience (the impersonality of interacting with a computer)	3.0	2.7	4.2**	2.4**
^z 1 =not important, 5=very important.				
^y Pre-test or post-test classroom and online means with ** are significantly different at p=.01.				

APPENDIX

Surveys with paired data.....29

Brainerd survey and frequencies of responses (pre-test and post-test)
Distributed in class to a random sample of Master Gardener trainees

Litchfield survey and frequencies of responses (pre-test and post-test)
Distributed in class to a random sample of Master Gardeners trainees

Rochester survey and frequencies of responses (pre-test and post-test)
Distributed in class to a random sample of Master Gardeners trainees

Online Class survey and frequencies of responses (pre-test and post-test)
Mailed January 1999 to all members of online class trainees

Surveys without paired data.....57

Table comparing learned horticulture outcomes for pre-test and post-test between
outstate classes (Brainerd, Litchfield, Rochester scores averaged together), St.
Paul, and online classes.

St. Paul survey and frequencies of responses (pre-test and post-test)

Online modules for the Master Gardener Course (printed for appendix in March 2001,
after the course).....65

- Home Page
- Course Module Page
- Master Gardener State and Local Overview
- Indoor Gardening
- Herbaceous Plants
- Botany
- Plant Pathology
- Pesticide Use and Safety
- Soils
- Entomology
- Turfgrass
- Landscaping
- Fruits and Vegetables
- Living with Wildlife
- Trees and Shrubs

UNIVERSITY OF MINNESOTA

Extension

S E R V I C E

**Master Gardener
Program**

January 2000

MINNESOTA LANDSCAPE
ARBORETUM375 Arboretum Dr.
P.O. Box 39
St. Paul, MN 55317-0039PHONE
(612) 443-2460FAX
(612) 443-2521

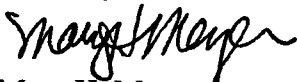
Dear Master Gardener Core Course/Horticulture 1003 Student,

You are invited to participate in a research study to evaluate the effectiveness of a traditional, face-to-face class with an Internet or online class. The information you provide is extremely important to the results of this study. The project is being conducted by Dr. Mary H. Meyer, assistant professor, and Karen Jeannette, teaching assistant and graduate student, Department of Horticultural Science. If you have questions please contact contact me at 612- 443-2460 x 639, or mmeyer@extension.umn.edu.

The purpose of the project is to compare online teaching with a traditional class. Also, student satisfaction, workload, and flexibility will be evaluated to provide a well-rounded view of the total learning experience. Please take a few minutes to complete the attached evaluation and pretest. Answer the questions to the best of your current ability, **DO NOT** use additional resources to answer the horticulture questions, or worry about the correct answer, we are interested in your current knowledge **BEFORE** the course.

Your input in this project will be kept private, in a locked file; only the researchers will have access to the records. **DO NOT INCLUDE YOUR NAME** on the evaluations, they will be kept anonymous. Your input **WILL NOT** affect your grade or participation in the class or the volunteer program and cannot be tracked to a particular individual. If you choose not to participate in this evaluation, it will not affect your relations with the instructors or your grade. Your input is highly valued. **PLEASE RETURN THE EVALUATION IN CLASS TODAY.** Thank you for your participation.

Sincerely,



Mary H. Meyer
Extension Horticulturist

Master Gardener Core Course/ Hort 1003
Pre-Test, Spring 2000

FREQUENCIES = (#)

1. Food manufactured in the leaves moves to the roots through the:
 - a) xylem (4)
 - b) cambium (9)
 - c) phloem (4)
 - d) epidermis (5)
2. A perfect flower has:
 - a) both stamens and pistil (18)
 - b) both petals and sepals (4)
 - c) only petals
 - d) only stamens
3. The metabolic process where a plant uses carbohydrates produced during photosynthesis for growth is known as:
 - a) transpiration (10)
 - b) absorption (12)
 - c) respiration (2)
 - d) evapotranspiration
4. Working garden soils when very wet destroys soil:
 - a) texture (9)
 - b) color (1)
 - c) structure (13)
 - d) organic matter (2)
5. Most soil nutrients needed for plant growth are most available in a soil pH range of:
 - a) pH 8-9 (2)
 - b) pH 6-7 (19)
 - c) pH 3-4 (2)
 - d) pH 10-11 (1)
6. The amount of sand, silt, and clay in a soil refers to:
 - a) soil texture (4)
 - b) soil structure (19)
 - c) soil chemical composition (2)
 - d) soil pH
7. Failure of young fruit trees to bear fruit is related to a particular growth stage known as juvenility.
 - a) True (13)
 - b) False (12)
8. Which of the following series of plants would be good for a rotation plan for disease reduction?
 - a) squash, pumpkin, cucumber (3)
 - b) corn, potatoes, beans (10)
 - c) tomato, eggplant, pepper (5)
 - d) broccoli, cauliflower, Brussels sprouts (6)

9. The purpose of mulch in the vegetable garden is to:
- conserve moisture (2)
 - keep the soil cool in summer (1)
 - keep the produce clean
 - eliminate cultivation
 - all of the above (22)
10. Insects with piercing-sucking mouthparts cause damage by:
- removing plant juices (5)
 - causing growth distortions by injecting foreign enzymes
 - transmission of plant viruses (1)
 - all of the above (19)
11. The best time to control a caterpillar defoliator is:
- when the caterpillars are most noticeable (1)
 - whenever the damage is noticed
 - when the damage is just beginning (10)
 - when the eggs are present (14)
12. What do springtails, fungus gnats, and slugs have in common?
- moisture control will help reduce their population (13)
 - they are not true insects (4)
 - none do any damage (1)
 - they are all predators (6)
13. Powdery mildews are easy to recognize by:
- the powdery white fungal growth on foliage (22)
 - lower leaf yellowing
 - large spots with yellow borders (1)
 - branch dieback (1)
14. Viral diseases are spread primarily by:
- aphid feeding
 - wireworm feeding (5)
 - grasshopper feeding
 - wind (19)
15. To help prevent oak wilt disease in Minnesota DO NOT PRUNE oaks in :
- January, February, March (1)
 - April, May, June (15)
 - July, August, September (2)
 - October, November, December
16. If a homeowner decides on fertilizing their lawn once a year, which is the best time to fertilize?
- April - early June (14)
 - July
 - September (1)
 - November

17. Leaving lawn clippings after mowing can account for:
- a) all the fertilizer a lawn needs in a year (6)
 - b) one application of fertilizer a year (8)
 - c) two applications of fertilizer a year (2)
 - d) little nutritional value for a lawn (9)
18. A person wishing to establish a lawn in a sunny area with low maintenance should select:
- a) improved bluegrasses (5)
 - b) improved perennial ryegrasses (7)
 - c) common bluegrasses & fine leaved fescues (10)
 - d) annual or Italian ryegrasses & fine leaved fescues (2)
19. The MOST limiting factor in growing indoor plants in Minnesota is:
- a) oxygen
 - b) water (6)
 - c) light (20)
 - d) temperature (4)
20. When is the best time to fertilize a houseplant?
- a) when you want the plant to produce new growth (5)
 - b) as often as the label recommends (4)
 - c) when the plant is growing actively (6)
 - d) whenever you see yellow foliage
21. Annual and perennial flowers have different needs, such as:
- a) annuals require more division
 - b) perennials need spring fertilization (2)
 - c) annuals need deadheading, but not perennials (1)
 - d) annuals require more water and fertilizer, perennials require division (22)
22. Winter mulch should be applied:
- a) after the first frost (7)
 - b) after the ground is frozen (14)
 - c) after all the leaves have fallen from silver maples (1)
 - d) anytime after Halloween (3)
23. Which should NOT be included for hardening annuals prior to planting into the garden?
- a) moving the plants outdoors
 - b) fertilizing (12)
 - c) withholding water (13)
 - d) lowering the temperature
24. The best way to reduce animal pest problems is to:
- a) eliminate the pest's habitat (12)
 - b) use chemical repellants (1)
 - c) use plant repellants (9)
 - d) keep a large dog in the area (3)

25. Moles primarily feed on:
- underground plant roots (21)
 - soil invertebrates (4)
 - smaller rodents
 - lawn clippings and humus
26. The reentry statement on a pesticide label states how much time must pass before:
- another pesticide may be applied (5)
 - produce may be harvested (10)
 - produce may be sold in interstate commerce
 - people may reenter a treated area without proper clothing (9)
27. You should read the pesticide label before you:
- purchase a pesticide
 - apply the pesticide (1)
 - dispose of a pesticide
 - all of the above (24)
28. A good evergreen for hedges in Minnesota is:
- Northern Lights azaleas, *Rhododendron prinophyllum* hybrids
 - Arborvitae, *Thuja occidentalis* (19)
 - Lombardy poplar, *Populus nigra 'Italica'* (3)
 - American larch, *Larix laricina*
29. Renewal pruning is accomplished for older or overgrown shrubs by:
- cutting the plant back half way to the ground (6)
 - cutting the plant off at the ground line
 - cutting 1/3 of the plant out this year and 1/3 out for each of the next two years (18)
 - cutting 1/3 of the plant out this year and 2/3 next year
30. Shigo indicates that trees form four walls or barriers to disease entering around a wound. Of all the walls, the last wall or barrier to form is the strongest disease barrier but the weakest structurally.
- True (17)
 - False (6)

*Please answer the following questions to the best of your ability.

1. Rate the importance you expect the following items will have in your learning experience in this class.

	Not Important		Important			Don't Know	
a. instructor's lecture	1	2	3 (3)	4 (3)	5 (18)	6	
b. handouts /text that accompanied lecture	1	2	3 (1)	4 (5)	5 (18)	6	
c. reading the textbook	1	2	3 (2)	4 (9)	5 (13)	6	
d. reading the extension publications	1	2	3 (2)	4 (10)	5 (12)	6	
e. quizzes/examinations		1 (1)	2 (4)	3 (11)	4 (5)	5 (3)	6
f. interaction with classmates	1	2	3 (5)	4 (8)	5 (9)	6 (1)	
g. other _____							

How comfortable are you in asking questions during class?

Not Comfortable 1 (1) 2 (1) 3 (6) 4 (8) 5 (8) Very Comfortable

3. What advantages of a face-to-face class do you perceive as important?

	Not Important		Important		
a. better learning resources (lectures, instructor-given, handouts or overheads)	1	2	3 (3)	4 (8)	5 (12)
b. structured learning environment (instructor/class provides the tempo for assignments and tasks.)	1	2 (1)	3 (5)	4 (8)	5 (9)
c. regular scheduled time (lectures/class participation are set and do not vary)	1 (1)	2 (1)	3 (6)	4 (7)	5 (8)
d. more guidance for when and how to studying	1 (1)	2 (2)	3 (9)	4 (5)	5 (6)
e. face to face interaction with other students	1	2	3 (7)	4 (8)	5 (8)
f. face to face interaction with the instructor	1	2	3 (3)	4 (8)	5 (12)

4. What advantages of an Internet class do you perceive as important?

	Not Important		Important		
a. better learning resources (class resources, other web sites, textbook)	1 (1)	2 (6)	3 (7)	4 (7)	5 (1)
b. more flexible pace of learning (you set your own pace)	1	2	3 (4)	4 (10)	5 (8)
c. greater choice of when to study (you access the course anytime, day or night)	1	2	3 (5)	4 (11)	5 (5)
d. increase self-reliance (a computer based system may improve your ability to work on you own)	1	2 (2)	3 (11)	4 (9)	5
e. improved computer literacy	1 (2)	2 (2)	3 (9)	4 (6)	5 (3)
f. more interaction with fellow classmates (access to send messages at anytime)	1 (3)	2 (8)	3 (7)	4 (1)	5 (2)
g. no driving or commuting time	1 (4)	2	3 (6)	4 (7)	5 (8)

5. What disadvantages of a face-to-face class do you perceive as important ?

	Not Important		Important		
a. poorer learning resources (the instructor and live presentation are inadequate)	1 (2)	2 (4)	3 (7)	4 (5)	5 (2)
b. class time is not flexible	1	2 (4)	3 (10)	4 (5)	5 (3)
c. limited interaction with other students outside of class	1 (2)	2 (6)	3 (10)	4 (4)	5
d. limited interaction with the instructor outside of class	1 (1)	2 (8)	3 (8)	4 (4)	5 (1)
e. no opportunity to use the Internet as a resource	1 (3)	2 (6)	3 (7)	4 (5)	5 (1)
f. driving/commuting time to get to class	1 (2)	2 (4)	3 (10)	4 (2)	5 (5)

6. What disadvantages of an Internet class do you perceive as important?

	Not Important		Important		
a. poorer learning resources (internet resources are inadequate)	1	2 (3)	3 (7)	4 (9)	5 (1)
b. an alienating learning experience (the impersonality of interacting with a computer)	1	2 (4)	3 (6)	4 (8)	5 (3)
c. technical frustration (understanding the computer and programs)	1	2 (2)	3 (4)	4 (9)	5 (6)
d. inadequate access to computer	1 (1)	2 (5)	3 (4)	4 (5)	5 (6)
e. loss of contact with instructor	1	2 (1)	3 (4)	4 (10)	5 (1)
f. loss of contact with other students	1 (1)	2 (3)	3 (4)	4 (10)	5 (2)

7. Choose the answer that best explains your experience with the following Internet tools. Use all responses that apply.

a=16 e=5
d=1 f=1

email

a=7 e=13

listserve/mailling list

d=1 f=1

chat room

a=1 e=16

d=1 f=1

bulletin board

a=4 e=15

d=2 f=1

- A. I've used this tool before.
 B. Technical aspects made it difficult to use.
 C. I had difficulty finding time to use this tool.
 D. I don't know what this tool does.
 E. I have no experience using this tool.
 F. Other _____

8. Please rate your level of satisfaction with the following:

	Unsatisfied			Satisfied			Have not used
a. email	1	2	3	4 (5)	5 (1)		6 (6)
b. chat room	1	2	3 (3)	4	5 (1)		6 (18)
c. listserve/mailling list	1	2	3 (2)	4 (2)	5 (2)		6 (16)
d. bulletin board	1	2 (17)	3 (1)	4 (1)	5 (1)		6 (18)

9. Why did you decide to take the face-to-face class instead of the Internet class?

10. In **ADDITION TO** the 12 hours in class each week, how much time do you expect to spend studying for this class per week ?

- a. 0-1 hours (1)
 b. 2-3 hours (4)
 c. 4-5 hours (6)
 d. 5-6 hours (12)

11. How much time do you spend commuting for this class each day?

- a. less than 1 hour (12)
 b. 1-2 hours (7)
 c. 2-3 hours (2)
 d. more than 3 hours (1)

12. How many miles do you drive to and from the class?

- a. less than 10 miles (2)
 b. 10 - 25 miles (6)
 c. 26 - 40 miles (6)
 d. 60 + miles (9)

13. Your Age Group

- a. 18-25
 b. 26-35 (1)
 c. 36-45 (4)
 d. 46-60 (14)
 e. 60+ (4)

14. Gender:

- a. female (17)
- b. male (6)

15. Educational Background

- a. high school diploma (3)
- b. vocational/technical degree (7)
- c. college degree: (8) bachelor's degree (5) graduate

16. Why are you taking this class?

- a. to fulfill a degree requirement
- b. for university credit
- c. to become a University of Minnesota Extension Service Master Gardener (5)
- d. professional improvement
- e. personal improvement (8)
- e. other:

Thank you for your cooperation. Your input is very helpful.

Please feel free to add any additional comments here:

Master Gardener Core Course/ Hort 1003
Post-Test, Spring 2000

FREQUENCIES = (#)

1. Food manufactured in the leaves moves to the roots through the:
 - a) xylem (3)
 - b) cambium (1)
 - c) phloem (19)
 - d) epidermis (1)

2. A perfect flower has:
 - a) both stamens and pistil (19)
 - b) both petals and sepals (3)
 - c) only petals (1)
 - d) only stamens

3. The metabolic process where a plant uses carbohydrates produced during photosynthesis for growth is known as:
 - a) transpiration (9)
 - b) absorption (1)
 - c) respiration (15)
 - d) evapotranspiration

4. Working garden soils when very wet destroys soil:
 - a) texture (7)
 - b) color
 - c) structure (18)
 - d) organic matter

5. Most soil nutrients needed for plant growth are most available in a soil pH range of:
 - a) pH 8-9 (1)
 - b) pH 6-7 (24)
 - c) pH 3-4
 - d) pH 10-11

6. The amount of sand, silt, and clay in a soil refers to:
 - a) soil texture (20)
 - b) soil structure (5)
 - c) soil chemical composition
 - d) soil pH

7. Failure of young fruit trees to bear fruit is related to a particular growth stage known as juvenility.
 - a) True (21)
 - b) False (3)

8. Which of the following series of plants would be good for a rotation plan for disease reduction?
 - a) squash, pumpkin, cucumber (1)
 - b) corn, potatoes, beans (20)
 - c) tomato, eggplant, pepper (2)
 - d) broccoli, cauliflower, Brussels sprouts (2)

9. The purpose of mulch in the vegetable garden is to:
- conserve moisture (1)
 - keep the soil cool in summer
 - keep the produce clean
 - eliminate cultivation
 - all of the above (24)
10. Insects with piercing-sucking mouthparts cause damage by:
- removing plant juices (1)
 - causing growth distortions by injecting foreign enzymes
 - transmission of plant viruses
 - all of the above (24)
11. The best time to control a caterpillar defoliator is:
- when the caterpillars are most noticeable (20)
 - whenever the damage is noticed (2)
 - when the damage is just beginning (3)
 - when the eggs are present
12. What do springtails, fungus gnats, and slugs have in common?
- moisture control will help reduce their population (20)
 - they are not true insects (2)
 - none do any damage (3)
 - they are all predators
13. Powdery mildews are easy to recognize by:
- the powdery white fungal growth on foliage (25)
 - lower leaf yellowing
 - large spots with yellow borders
 - branch dieback
14. Viral diseases are spread primarily by:
- aphid feeding (9)
 - wireworm feeding
 - grasshopper feeding
 - wind (16)
15. To help prevent oak wilt disease in Minnesota DO NOT PRUNE oaks in :
- January, February, March (1)
 - April, May, June (21)
 - July, August, September (3)
 - October, November, December
16. If a homeowner decides on fertilizing their lawn once a year, which is the best time to fertilize?
- April - early June (2)
 - July
 - September (20)
 - November (3)

7. Leaving lawn clippings after mowing can account for:

- all the fertilizer a lawn needs in a year
- one application of fertilizer a year (25)
- two applications of fertilizer a year
- little nutritional value for a lawn

8. A person wishing to establish a lawn in a sunny area with low maintenance should select:

- improved bluegrasses
- improved perennial ryegrasses
- common bluegrasses & fine leaved fescues (24)
- annual or Italian ryegrasses & fine leaved fescues (1)

9. The MOST limiting factor in growing indoor plants in Minnesota is:

- oxygen
- water
- light (24)
- temperature (1)

10. When is the best time to fertilize a houseplant?

- when you want the plant to produce new growth
- as often as the label recommends
- when the plant is growing actively (25)
- whenever you see yellow foliage

11. Annual and perennial flowers have different needs, such as:

- annuals require more division
- perennials need spring fertilization
- annuals need deadheading, but not perennials (1)
- annuals require more water and fertilizer, perennials require division 24

12. Winter mulch should be applied:

- after the first frost (6)
- after the ground is frozen (18)
- after all the leaves have fallen from silver maples.
- anytime after Halloween (1)

13. Which should NOT be included for hardening annuals prior to planting into the garden?

- moving the plants outdoors
- fertilizing (23)
- withholding water
- lowering the temperature (2)

14. The best way to reduce animal pest problems is to:

- eliminate the pest's habitat (24)
- use chemical repellants
- use plant repellants
- keep a large dog in the area

25. Moles primarily feed on:
- underground plant roots (10)
 - soil invertebrates (13)
 - smaller rodents (1)
 - lawn clippings and humus
26. The reentry statement on a pesticide label states how much time must pass before:
- another pesticide may be applied (1)
 - produce may be harvested (1)
 - produce may be sold in interstate commerce (22)
 - people may reenter a treated area without proper clothing
27. You should read the pesticide label before you:
- purchase a pesticide
 - apply the pesticide (2)
 - dispose of a pesticide (22)
 - all of the above
28. A good evergreen for hedges in Minnesota is:
- Northern Lights azaleas, *Rhododendron prinophyllum* hybrids (4)
 - Arborvitae, *Thuja occidentalis* (19)
 - Lombardy poplar, *Populus nigra 'Italica'* (1)
 - American larch, *Larix laricina*
29. Renewal pruning is accomplished for older or overgrown shrubs by:
- cutting the plant back half way to the ground (1)
 - cutting the plant off at the ground line (1)
 - cutting 1/3 of the plant out this year and 1/3 out for each of the next two years (20)
 - cutting 1/3 of the plant out this year and 2/3 next year
30. Shigo indicates that trees form four walls or barriers to disease entering around a wound. Of all the walls, the last wall or barrier to form is the strongest disease barrier but the weakest structurally.
- True (18)
 - False (5)

*Please answer the following questions to the best of your ability.

1. Rate the importance the following items had in your learning experience in this class.

	Not Important		Important			Don't Know
a. instructor's lecture	1	2	3 (1)	4 (2)	5 (19)	6
b. handouts /text that accompanied lecture	1	2	3 (1)	4 (5)	5 (18)	6
c. reading the textbook	1	2	3 (4)	4 (8)	5 (12)	6
d. reading the extension publications	1	2	3 (5)	4 (8)	5 (10)	6 (1)
e. quizzes/examinations	1 (3)	2 (2)	3 (10)	4 (6)	5 (2)	6 (1)
f. interaction with classmates	1 (1)	2	3 (6)	4 (8)	5 (9)	6
g. other _____						

2. How comfortable were you in asking questions during class?

Not Comfortable 1 (1) 2 (2) 3 (2) 4 (5) 5 (13) Very Comfortable

3. What advantages of a face-to-face class do you perceive as important?

	Not Important		Important		
a. better learning resources (lectures, instructor-given, handouts or overheads)	1	2	3(4)	4(10)	5(10)
b. structured learning environment (instructor/class provides the tempo for assignments and tasks.)	1	2	3(5)	4(10)	5(9)
c. regular scheduled time (lectures/class participation are set and do not vary)	1(1)	2(1)	3(3)	4(7)	5(12)
d. more guidance for when and how to studying	1(2)	2(2)	3(10)	4(5)	5(5)
e. face to face interaction with other students	1(1)	2	3(5)	4(7)	5(11)
f. face to face interaction with the instructor	1	2(1)	3(3)	4(5)	5(15)

4. What advantages of an Internet class do you perceive as important?

	Not Important		Important		
a. better learning resources (class resources, other web sites, textbook)	1(2)	2(2)	3(12)	4(3)	5(3)
b. more flexible pace of learning (you set your own pace)	1(1)	2(3)	3(4)	4(16)	5(5)
c. greater choice of when to study (you access the course anytime, day or night)	1(1)	2(6)	3(6)	4(8)	5(5)
d. increase self-reliance (a computer based system may improve your ability to work on you own)	1(3)	2(1)	3(9)	4(6)	5(4)
e. improved computer literacy	1(2)	2(3)	3(10)	4(4)	5(4)
f. more interaction with fellow classmates (access to send messages at anytime)	1(4)	2(4)	3(11)	4(2)	5(2)
g. no driving or commuting time	1(1)	2	3(6)	4(7)	5(8)

5. What disadvantages of a face-to-face class do you perceive as important?

	Not Important		Important		
a. poorer learning resources (the instructor and live presentation are inadequate)	1(5)	2(1)	3(9)	4(2)	5(4)
b. class time is not flexible	1(6)	2(3)	3(7)	4(4)	5(3)
c. limited interaction with other students outside of class	1(2)	2(4)	3(8)	4(4)	5(4)
d. limited interaction with the instructor outside of class	1(3)	2(3)	3(9)	4(4)	5(4)
e. no opportunity to use the Internet as a resource	1(4)	2(5)	3(7)	4(5)	5(2)
f. driving/commuting time to get to class	1(5)	2(2)	3(7)	4(3)	5(5)

6. What disadvantages of an Internet class do you perceive as important?

	Not Important		Important		
a. poorer learning resources (internet resources are inadequate)	1(2)	2(5)	3(11)	4(1)	5(3)
b. an alienating learning experience (the impersonality of interacting with a computer)	1(2)	2(4)	3(9)	4(5)	5(3)
c. technical frustration (understanding the computer and programs)	1(2)	2(2)	3(8)	4(5)	5(6)
d. inadequate access to computer	1(4)	2(1)	3(5)	4(5)	5(7)
e. loss of contact with instructor	1(1)	2	3(5)	4(9)	5(8)
f. loss of contact with other students	1(1)	2(2)	3(6)	4(8)	5(6)

7. Choose the answer that best explains your experience with the following Internet tools. Use all responses that apply.

email $a=15$ $e=5$
 $c=2$ $f=1$

listserve/mailling list $a=6$ $e=10$
 $d=1$ $f=1$

chat room $a=4$ $d=1$
 $c=1$ $e=17$
 $f=1$

bulletin board $a=1$ $e=17$
 $d=1$ $f=1$

- A. I've used this tool before.
- B. Technical aspects made it difficult to use.
- C. I had difficulty finding time to use this tool.
- D. I don't know what this tool does.
- E. I have no experience using this tool.
- F. Other _____

8. Please rate your level of satisfaction with the following:

	Unsatisfied		Satisfied			Have not used
a. email	1	2	3 (2)	4 (1)	5 (12)	6 (8)
b. chat room	1 (3)	2	3 (4)	4 (1)	5 (2)	6 (18)
c. listserve/mailling list	1	2	3 (2)	4 (1)	5 (1)	6 (19)
d. bulletin board	1	2 (1)	3	4 (1)	5 (2)	6 (19)

9. In ADDITION TO the 12 hours in class each week, how much time did you spend studying for this class?

- a. 0-1 hours (4)
- b. 2-3 hours (8)
- c. 4-5 hours (9)
- d. 5-6 hours (1)

10. How would you rate the workload of the class?

- a. Too much work (2)
- b. Just right (18)
- c. Too little work (3)

Comments:

11. My daily commute to and from class was 1.45 hours.

12. Based on the amount of time you spend commuting to and from this class, please rate how worthwhile it was for you to drive to this class.

Not Worthwhile		Very Worthwhile		
1	2	3	4 (4)	5 (20)

Comments:

LITCHFIELD

UNIVERSITY OF MINNESOTA
Extension
S E R V I C E

**Master Gardener
Program**

MINNESOTA LANDSCAPE
ARBORETUM
3675 Arboretum Dr.
P.O. Box 39
Chanhassen, MN 55317-0039

PHONE
(612) 443-2460

FAX
(612) 443-2521

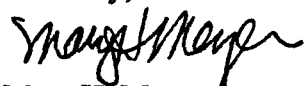
January 2000

Dear Master Gardener Core Course/Horticulture 1003 Student,

You are invited to participate in a research study to evaluate the effectiveness of a traditional, face-to-face class with an Internet or online class. The information you provide is extremely important to the results of this study. The project is being conducted by Dr. Mary H. Meyer, assistant professor, and Karen Jeannette, teaching assistant and graduate student, Department of Horticultural Science. If you have questions please contact contact me at 612- 443-2460 x 639, or mmeyer@extension.umn.edu.

The purpose of the project is to compare online teaching with a traditional class. Also, student satisfaction, workload, and flexibility will be evaluated to provide a well-rounded view of the total learning experience. Please take a few minutes to complete the attached evaluation and pretest. Answer the questions to the best of your current ability, **DO NOT** use additional resources to answer the horticulture questions, or worry about the correct answer, we are interested in your current knowledge **BEFORE** the course.

Your input in this project will be kept private, in a locked file; only the researchers will have access to the records. **DO NOT INCLUDE YOUR NAME** on the evaluations, they will be kept anonymous. Your input **WILL NOT** affect your grade or participation in the class or the volunteer program and cannot be tracked to a particular individual. If you choose not to participate in this evaluation, it will not affect your relations with the instructors or your grade. Your input is highly valued. **PLEASE RETURN THE EVALUATION IN CLASS TODAY.** Thank you for your participation.

Sincerely,

Mary H. Meyer
Extension Horticulturist

Master Gardener Core Course/ Hort 1003
Pre-Test, Spring 2000

FREQUENCIES = (#)

1. Food manufactured in the leaves moves to the roots through the:
 - a) xylem (5)
 - b) cambium (8)
 - c) phloem (6)
 - d) epidermis
2. A perfect flower has:
 - a) both stamens and pistil (17)
 - b) both petals and sepals (2)
 - c) only petals
 - d) only stamens
3. The metabolic process where a plant uses carbohydrates produced during photosynthesis for growth is known as:
 - a) transpiration (15)
 - b) absorption (10)
 - c) respiration (1)
 - d) evapotranspiration
4. Working garden soils when very wet destroys soil:
 - a) texture (12)
 - b) color (11)
 - c) structure
 - d) organic matter
5. Most soil nutrients needed for plant growth are most available in a soil pH range of:
 - a) pH 8-9
 - b) pH 6-7 (20)
 - c) pH 3-4 (1)
 - d) pH 10-11
6. The amount of sand, silt, and clay in a soil refers to:
 - a) soil texture (7)
 - b) soil structure (13)
 - c) soil chemical composition (1)
 - d) soil pH (1)
7. Failure of young fruit trees to bear fruit is related to a particular growth stage known as juvenility.
 - a) True (5)
 - b) False (5)
8. Which of the following series of plants would be good for a rotation plan for disease reduction?
 - a) squash, pumpkin, cucumber
 - b) corn, potatoes, beans (15)
 - c) tomato, eggplant, pepper (4)
 - d) broccoli, cauliflower, Brussels sprouts (1)

9. The purpose of mulch in the vegetable garden is to:
- a) conserve moisture (1)
 - b) keep the soil cool in summer
 - c) keep the produce clean
 - d) eliminate cultivation
 - e) all of the above (22)
10. Insects with piercing-sucking mouthparts cause damage by:
- a) removing plant juices (1)
 - b) causing growth distortions by injecting foreign enzymes
 - c) transmission of plant viruses
 - d) all of the above (22)
11. The best time to control a caterpillar defoliator is:
- a) when the caterpillars are most noticeable (1)
 - b) whenever the damage is noticed
 - c) when the damage is just beginning (3)
 - d) when the eggs are present (18)
12. What do springtails, fungus gnats, and slugs have in common?
- a) moisture control will help reduce their population (17)
 - b) they are not true insects (1)
 - c) none do any damage
 - d) they are all predators (12)
13. Powdery mildews are easy to recognize by:
- a) the powdery white fungal growth on foliage (22)
 - b) lower leaf yellowing
 - c) large spots with yellow borders (1)
 - d) branch dieback
14. Viral diseases are spread primarily by:
- a) aphid feeding (6)
 - b) wireworm feeding
 - c) grasshopper feeding
 - d) wind (15)
15. To help prevent oak wilt disease in Minnesota DO NOT PRUNE oaks in :
- a) January, February, March (1)
 - b) April, May, June (10)
 - c) July, August, September (10)
 - d) October, November, December
16. If a homeowner decides on fertilizing their lawn once a year, which is the **best** time to fertilize?
- a) April - early June (8)
 - b) July (13)
 - c) September (1)
 - d) November

17. Leaving lawn clippings after mowing can account for:
- a) all the fertilizer a lawn needs in a year (1)
 - b) one application of fertilizer a year (10)
 - c) two applications of fertilizer a year (3)
 - d) little nutritional value for a lawn (7)
18. A person wishing to establish a lawn in a sunny area with low maintenance should select:
- a) improved bluegrasses (10)
 - b) improved perennial ryegrasses (6)
 - c) common bluegrasses & fine leaved fescues (16)
 - d) annual or Italian ryegrasses & fine leaved fescues
19. The MOST limiting factor in growing indoor plants in Minnesota is:
- a) oxygen
 - b) water (1)
 - c) light (20)
 - d) temperature (2)
20. When is the best time to fertilize a houseplant?
- a) when you want the plant to produce new growth (8)
 - b) as often as the label recommends (3)
 - c) when the plant is growing actively (11)
 - d) whenever you see yellow foliage (1)
21. Annual and perennial flowers have different needs, such as:
- a) annuals require more division
 - b) perennials need spring fertilization (2)
 - c) annuals need deadheading, but not perennials
 - d) annuals require more water and fertilizer, perennials require division (20)
22. Winter mulch should be applied:
- a) after the first frost (10)
 - b) after the ground is frozen (11)
 - c) after all the leaves have fallen from silver maples (1)
 - d) anytime after Halloween (1)
23. Which should NOT be included for hardening annuals prior to planting into the garden?
- a) moving the plants outdoors
 - b) fertilizing (8)
 - c) withholding water (13)
 - d) lowering the temperature (2)
24. The best way to reduce animal pest problems is to:
- a) eliminate the pest's habitat (16)
 - b) use chemical repellants
 - c) use plant repellants (4)
 - d) keep a large dog in the area (3)

25. Moles primarily feed on:

- a) underground plant roots (18)
- b) soil invertebrates (3)
- c) smaller rodents (1)
- d) lawn clippings and humus (1)

26. The reentry statement on a pesticide label states how much time must pass before:

- a) another pesticide may be applied (4)
- b) produce may be harvested (8)
- c) produce may be sold in interstate commerce (9)
- d) people may reenter a treated area without proper clothing

27. You should read the pesticide label before you:

- a) purchase a pesticide
- b) apply the pesticide (1)
- c) dispose of a pesticide
- d) all of the above (22)

28. A good evergreen for hedges in Minnesota is:

- a) Northern Lights azaleas, *Rhododendron prinophyllum* hybrids (1)
- b) Arborvitae, *Thuja occidentalis* (20)
- c) Lombardy poplar, *Populus nigra 'Italica'* (1)
- d) American larch, *Larix laricina* (1)

29. Renewal pruning is accomplished for older or overgrown shrubs by:

- a) cutting the plant back half way to the ground (4)
- b) cutting the plant off at the ground line
- c) cutting 1/3 of the plant out this year and 1/3 out for each of the next two years (17)
- d) cutting 1/3 of the plant out this year and 2/3 next year

30. Shigo indicates that trees form four walls or barriers to disease entering around a wound. Of all the walls, the last wall or barrier to form is the strongest disease barrier but the weakest structurally.

- a) True (9)
- b) False (7)

*Please answer the following questions to the best of your ability.

1. Rate the importance you expect the following items will have in your learning experience in this class.

	Not Important		Important			Don't Know
a. instructor's lecture	1	2	3 (1)	4 (3)	5 (1)	6
b. handouts/text that accompanied lecture	1	2	3	4 (4)	5 (19)	6
c. reading the textbook	1	2	3 (3)	4 (6)	5 (14)	6
d. reading the extension publications	1	2	3	4 (12)	5 (11)	6
e. quizzes/examinations		1	2 (4)	3 (6)	4 (9)	5 (4) 6
f. interaction with classmates	1 (1)	2	3 (4)	4 (16)	5 (8)	6
g. other						

2. How comfortable are you in asking questions during class?

Not Comfortable 1 (1) 2 3 (3) 4 (7) 5 (1) Very Comfortable

3. What advantages of a face-to-face class do you perceive as important?

	Not Important		Important		
a. better learning resources (lectures, instructor-given, handouts or overheads)	1	2	3(2)	4(10)	5(9)
b. structured learning environment (instructor/class provides the tempo for assignments and tasks.)	1	2	3(2)	4(13)	5(6)
c. regular scheduled time (lectures/class participation are set and do not vary)	1	2(2)	3(2)	4(8)	5
d. more guidance for when and how to studying	1(1)	2(2)	3(5)	4(9)	5(4)
e. face to face interaction with other students	1	2(1)	3(3)	4(10)	5(7)
f. face to face interaction with the instructor	1	2	3	4(7)	5(14)

4. What advantages of an Internet class do you perceive as important?

	Not Important		Important		
a. better learning resources (class resources, other web sites, textbook)	1(3)	2(2)	3(6)	4(2)	5(2)
b. more flexible pace of learning (you set your own pace)	1(2)	2	3(5)	4(6)	5(6)
c. greater choice of when to study (you access the course anytime, day or night)	1(2)	2	3(3)	4(6)	5(7)
d. increase self-reliance (a computer based system may improve your ability to work on you own)	1(3)	2(3)	3(9)	4(3)	5(1)
e. improved computer literacy	1(4)	2(1)	3(8)	4(4)	5(1)
f. more interaction with fellow classmates (access to send messages at anytime)	1(3)	2(3)	3(9)	4(3)	5(1)
g. no driving or commuting time	1(4)	2(1)	3(5)	4(3)	5(6)

5. What disadvantages of a face-to-face class do you perceive as important ?

	Not Important		Important		
a. poorer learning resources (the instructor and live presentation are inadequate)	1(4)	2(5)	3(6)	4(1)	5(2)
b. class time is not flexible	1(4)	2(2)	3(6)	4(3)	5(4)
c. limited interaction with other students outside of class	1(5)	2(3)	3(6)	4(4)	5(2)
d. limited interaction with the instructor outside of class	1(4)	2(5)	3(6)	4(3)	5(2)
e. no opportunity to use the Internet as a resource	1(3)	2(7)	3(5)	4(3)	5(2)
f. driving/commuting time to get to class	1(2)	2(5)	3(6)	4(5)	5(2)

6. What disadvantages of an Internet class do you perceive as important?

	Not Important		Important		
a. poorer learning resources (internet resources are inadequate)	1(2)	2(2)	3(9)	4(2)	5(3)
b. an alienating learning experience (the impersonality of interacting with a computer)	1(1)	2(2)	3(6)	4(5)	5(5)
c. technical frustration (understanding the computer and programs)	1(2)	2(3)	3(5)	4(3)	5(6)
d. inadequate access to computer	1(5)	2(3)	3(6)	4(2)	5(3)
e. loss of contact with instructor	1(1)	2	3(4)	4(8)	5(6)
f. loss of contact with other students	1(2)	2(4)	3(5)	4(3)	5(8)

7. Choose the answer that best explains your experience with the following Internet tools. Use all responses that apply.

email
 $a=16$ $f=3$
 $c=1$

listserve/mailling list
 $a=6$ $e=10$
 $d=2$ $f=1$

chat room
 $a=1$ $e=15$
 $c=2$ $f=1$

bulletin board
 $a=2$ $e=15$
 $d=1$ $f=1$

- A. I've used this tool before.
 B. Technical aspects made it difficult to use.
 C. I had difficulty finding time to use this tool.
 D. I don't know what this tool does.
 E. I have no experience using this tool.
 F. Other _____

8. Please rate your level of satisfaction with the following:

	Unsatisfied		Satisfied			Have not used
a. email	1	2	3 (2)	4 (1)	5 (11)	6 (5)
b. chat room	1	2	3 (1)	4	5 (2)	6 (15)
c. listserve/mailling list	1	2	3 (1)	4 (3)	5 (2)	6 (12)
d. bulletin board	1	2 (1)	3 (1)	4 (1)	5	6 (15)

9. Why did you decide to take the face-to-face class instead of the Internet class?

10. In **ADDITION TO** the 12 hours in class each week, how much time do you expect to spend studying for this class per week?

- a. 0-1 hours (1)
 b. 2-3 hours (14)
 c. 4-5 hours (5)
 d. 5-6 hours (2)

11. How much time do you spend commuting for this class each day?

- a. less than 1 hour (11)
 b. 1-2 hours (10)
 c. 2-3 hours
 d. more than 3 hours

12. How many miles do you drive to and from the class?

- a. less than 10 miles (2)
 b. 10 - 25 miles (5)
 c. 26 - 40 miles (8)
 d. 60 + miles (6)

13. Your Age Group

- a. 18-25
 b. 26-35 (3)
 c. 36-45 (4)
 d. 46-60 (12)
 e. 60+ (3)

14. Gender:

- a. female (16)
- b. male (3)

15. Educational Background

- a. high school diploma (3)
- b. vocational/technical degree (4)
- c. college degree: (10) bachelor's degree (4) graduate

16. Why are you taking this class?

- a. to fulfill a degree requirement
- b. for university credit
- c. to become a University of Minnesota Extension Service Master Gardener (15)
- d. professional improvement (2)
- e. personal improvement (3)
- e. other:

Thank you for your cooperation. Your input is very helpful.

Please feel free to add any additional comments here:

Master Gardener Core Course/ Hort 1003
Post-Test, Spring 2000

FREQUENCIES = (#)

1. Food manufactured in the leaves moves to the roots through the:
 - a) xylem (2)
 - b) cambium (2)
 - c) phloem (15)
 - d) epidermis (2)

2. A perfect flower has:
 - a) both stamens and pistil (22)
 - b) both petals and sepals (1)
 - c) only petals
 - d) only stamens

3. The metabolic process where a plant uses carbohydrates produced during photosynthesis for growth is known as:
 - a) transpiration (4)
 - b) absorption (1)
 - c) respiration (17)
 - d) evapotranspiration

4. Working garden soils when very wet destroys soil:
 - a) texture (7)
 - b) color
 - c) structure (5)
 - d) organic matter

5. Most soil nutrients needed for plant growth are most available in a soil pH range of:
 - a) pH 8-9 (1)
 - b) pH 6-7 (22)
 - c) pH 3-4
 - d) pH 10-11

6. The amount of sand, silt, and clay in a soil refers to:
 - a) soil texture (17)
 - b) soil structure (6)
 - c) soil chemical composition
 - d) soil pH

7. Failure of young fruit trees to bear fruit is related to a particular growth stage known as juvenility.
 - a) True (19)
 - b) False (3)

8. Which of the following series of plants would be good for a rotation plan for disease reduction?
 - a) squash, pumpkin, cucumber
 - b) corn, potatoes, beans (20)
 - c) tomato, eggplant, pepper (3)
 - d) broccoli, cauliflower, Brussels sprouts

9. The purpose of mulch in the vegetable garden is to:

- a) conserve moisture
- b) keep the soil cool in summer
- c) keep the produce clean
- d) eliminate cultivation
- e) all of the above (23)

10. Insects with piercing-sucking mouthparts cause damage by:

- a) removing plant juices (2)
- b) causing growth distortions by injecting foreign enzymes
- c) transmission of plant viruses
- d) all of the above (21)

11. The best time to control a caterpillar defoliator is:

- a) when the caterpillars are most noticeable
- b) whenever the damage is noticed
- c) when the damage is just beginning (7)
- d) when the eggs are present (15)

12. What do springtails, fungus gnats, and slugs have in common?

- a) moisture control will help reduce their population (16)
- b) they are not true insects (3)
- c) none do any damage (1)
- d) they are all predators (1)

13. Powdery mildews are easy to recognize by:

- a) the powdery white fungal growth on foliage (23)
- b) lower leaf yellowing
- c) large spots with yellow borders
- d) branch dieback

14. Viral diseases are spread primarily by:

- a) aphid feeding (8)
- b) wireworm feeding (2)
- c) grasshopper feeding (2)
- d) wind (16)

15. To help prevent oak wilt disease in Minnesota DO NOT PRUNE oaks in :

- a) January, February, March
- b) April, May, June (19)
- c) July, August, September (3)
- e) October, November, December

16. If a homeowner decides on fertilizing their lawn once a year, which is the best time to fertilize?

- a) April - early June
- b) July
- c) September (19)
- d) November (4)

17. Leaving lawn clippings after mowing can account for:
- all the fertilizer a lawn needs in a year
 - one application of fertilizer a year (23)
 - two applications of fertilizer a year
 - little nutritional value for a lawn
18. A person wishing to establish a lawn in a sunny area with low maintenance should select:
- improved bluegrasses (7)
 - improved perennial ryegrasses (1)
 - common bluegrasses & fine leaved fescues (14)
 - annual or Italian ryegrasses & fine leaved fescues
19. The MOST limiting factor in growing indoor plants in Minnesota is:
- oxygen
 - water
 - light (23)
 - temperature
20. When is the best time to fertilize a houseplant?
- when you want the plant to produce new growth (1)
 - as often as the label recommends (22)
 - when the plant is growing actively
 - whenever you see yellow foliage
21. Annual and perennial flowers have different needs, such as:
- annuals require more division
 - perennials need spring fertilization (2)
 - annuals need deadheading, but not perennials (1)
 - annuals require more water and fertilizer, perennials require division (19)
22. Winter mulch should be applied:
- after the first frost (2)
 - after the ground is frozen (20)
 - after all the leaves have fallen from silver maples
 - anytime after Halloween
23. Which should NOT be included for hardening annuals prior to planting into the garden?
- moving the plants outdoors (1)
 - fertilizing (15)
 - withholding water (5)
 - lowering the temperature (1)
24. The best way to reduce animal pest problems is to:
- eliminate the pest's habitat (22)
 - use chemical repellants
 - use plant repellants
 - keep a large dog in the area

25. Moles primarily feed on:
- underground plant roots (5)
 - soil invertebrates (16)
 - smaller rodents
 - lawn clippings and humus
26. The reentry statement on a pesticide label states how much time must pass before:
- another pesticide may be applied (1)
 - produce may be harvested (1)
 - produce may be sold in interstate commerce
 - people may reenter a treated area without proper clothing (20)
27. You should read the pesticide label before you:
- purchase a pesticide
 - apply the pesticide
 - dispose of a pesticide
 - all of the above (22)
28. A good evergreen for hedges in Minnesota is:
- Northern Lights azaleas, *Rhododendron prinophyllum* hybrids
 - Arborvitae, *Thuja occidentalis* (22)
 - Lombardy poplar, *Populus nigra 'Italica'*
 - American larch, *Larix laricina*
29. Renewal pruning is accomplished for older or overgrown shrubs by:
- cutting the plant back half way to the ground (1)
 - cutting the plant off at the ground line
 - cutting 1/3 of the plant out this year and 1/3 out for each of the next two years (21)
 - cutting 1/3 of the plant out this year and 2/3 next year
30. Shigo indicates that trees form four walls or barriers to disease entering around a wound. Of all the walls, the last wall or barrier to form is the strongest disease barrier but the weakest structurally.
- True (16)
 - False (5)

*Please answer the following questions to the best of your ability.

1. Rate the importance the following items had in your learning experience in this class.

	Not Important			Important			Don't Know
a. instructor's lecture	1	2	3	4 (2)	5 (20)	6	
b. handouts/text that accompanied lecture	1	2	3 (1)	4 (3)	5 (17)	6	
c. reading the textbook	1	2	3 (3)	4 (8)	5 (9)	6	
d. reading the extension publications	1	2	3 (3)	4 (11)	5 (5)	6 (1)	
e. quizzes/examinations	1 (2)	2 (1)	3 (7)	4 (7)	5 (3)	6 (1)	
f. interaction with classmates	1	2	3 (2)	4 (10)	5 (9)	6	
g. other _____							

2. How comfortable were you in asking questions during class?

Not Comfortable 1 2 (1) 3 (6) 4 (5) 5 (10) Very Comfortable

3. What advantages of a face-to-face class do you perceive as important?

	Not Important			Important	
a. better learning resources (lectures, instructor-given, handouts or overheads)	1	2	3	4 (9)	5 (12)
b. structured learning environment (instructor/class provides the tempo for assignments and tasks.)	1	2	3 (2)	4 (8)	5 (11)
c. regular scheduled time (lectures/class participation are set and do not vary)	1	2	3 (1)	4 (9)	5 (11)
d. more guidance for when and how to studying	1 (2)	2 (1)	3 (8)	4 (6)	5 (4)
e. face to face interaction with other students	1	2	3 (3)	4 (9)	5 (9)
f. face to face interaction with the instructor	1	2	3	4 (6)	5 (15)

4. What advantages of an Internet class do you perceive as important?

	Not Important			Important	
a. better learning resources (class resources, other web sites, textbook)	1	2 (1)	3 (11)	4 (5)	5 (2)
b. more flexible pace of learning (you set your own pace)	1 (1)	2 (1)	3 (4)	4 (9)	5 (4)
c. greater choice of when to study (you access the course anytime, day or night)	1 (2)	2 (6)	3 (8)	4 (3)	5
d. increase self-reliance (a computer based system may improve your ability to work on your own)	1	2 (3)	3 (7)	4 (6)	5 (3)
e. improved computer literacy	1 (4)	2 (1)	3 (6)	4 (5)	5 (3)
f. more interaction with fellow classmates (access to send messages at anytime)	1 (1)	2 (6)	3 (9)	4 (2)	5 (1)
g. no driving or commuting time	1	2 (1)	3 (3)	4 (9)	5 (6)

5. What disadvantages of a face-to-face class do you perceive as important?

	Not Important			Important	
a. poorer learning resources (the instructor and live presentation are inadequate)	1 (7)	2 (6)	3 (3)	4 (2)	5 (1)
b. class time is not flexible	1 (1)	2 (5)	3 (7)	4 (4)	5 (3)
c. limited interaction with other students outside of class	1 (3)	2 (6)	3 (6)	4 (4)	5 (1)
d. limited interaction with the instructor outside of class	1 (2)	2 (3)	3 (7)	4 (6)	5 (2)
e. no opportunity to use the Internet as a resource	1 (5)	2 (3)	3 (6)	4 (5)	5 (1)
f. driving/commuting time to get to class	1 (4)	2 (3)	3 (5)	4 (3)	5 (5)

6. What disadvantages of an Internet class do you perceive as important?

	Not Important			Important	
a. poorer learning resources (internet resources are inadequate)	1 (4)	2 (1)	3 (6)	4 (7)	5 (2)
b. an alienating learning experience (the impersonality of interacting with a computer)	1 (1)	2	3 (4)	4 (6)	5 (9)
c. technical frustration (understanding the computer and programs)	1 (2)	2 (2)	3 (3)	4 (8)	5 (5)
d. inadequate access to computer	1 (5)	2 (1)	3 (5)	4 (5)	5 (4)
e. loss of contact with instructor	1	2	3 (2)	4 (9)	5 (9)
f. loss of contact with other students	1	2 (1)	3 (4)	4 (8)	5 (7)

7. Choose the answer that best explains your experience with the following Internet tools. Use all responses that apply.

email	$a=16$ $e=3$	$f=1$	A. I've used this tool before.
listserve/mailling list	$a=6$ $b=1$	$d=3$ $e=9$	$f=1$
chat room	$a=2$ $d=1$	$f=14$ $e=3$	
bulletin board	$a=3$ $d=2$	$f=13$ $e=2$	

B. Technical aspects made it difficult to use.
C. I had difficulty finding time to use this tool.
D. I don't know what this tool does.
E. I have no experience using this tool.
F. Other _____

8. Please rate your level of satisfaction with the following:

	Unsatisfied			Satisfied			Have not used
a. email	1	2	3 (1)	4 (4)	5 (16)	6 (4)	
b. chat room	1	2 (1)	3 (1)	4	5	6 (17)	
c. listserve/mailling list	1	2 (1)	3 (2)	4 (3)	5 (3)	6 (10)	
d. bulletin board	1 (1)	2 (1)	3	4 (2)	5 (1)	6 (14)	

9. In **ADDITION TO** the 12 hours in class each week, how much time did you spend studying for this class?

- a. 0-1 hours (4)
- b. 2-3 hours (7)
- c. 4-5 hours (7)
- d. 5-6 hours (3)

10. How would you rate the workload of the class?

- a. Too much work (1)
- b. Just right (19)
- c. Too little work (1)

Comments:

11. My daily commute to and from class was 1.25 hours.

12. Based on the amount of time you spend commuting to and from this class, please rate how worthwhile it was for you to drive to this class.

Not Worthwhile				Very Worthwhile	
1	2	3 (1)	4	5 (20)	

Comments:

ROCHESTER

UNIVERSITY OF MINNESOTA
Extension
S E R V I C E

**Master Gardener
Program**

MINNESOTA LANDSCAPE
ARBORETUM

3675 Arboretum Dr.
P.O. Box 39
Chanhassen, MN 55317-0039

PHONE
(612) 443-2460

FAX
(612) 443-2521

January 2000

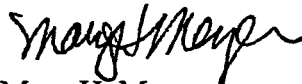
Dear Master Gardener Core Course/Horticulture 1003 Student,

You are invited to participate in a research study to evaluate the effectiveness of a traditional, face-to-face class with an Internet or online class. The information you provide is extremely important to the results of this study. The project is being conducted by Dr. Mary H. Meyer, assistant professor, and Karen Jeannette, teaching assistant and graduate student, Department of Horticultural Science. If you have questions please contact contact me at 612- 443-2460 x 639, or mmeyer@extension.umn.edu.

The purpose of the project is to compare online teaching with a traditional class. Also, student satisfaction, workload, and flexibility will be evaluated to provide a well-rounded view of the total learning experience. Please take a few minutes to complete the attached evaluation and pretest. Answer the questions to the best of your current ability, **DO NOT** use additional resources to answer the horticulture questions, or worry about the correct answer, we are interested in your current knowledge **BEFORE** the course.

Your input in this project will be kept private, in a locked file; only the researchers will have access to the records. **DO NOT INCLUDE YOUR NAME** on the evaluations, they will be kept anonymous. Your input **WILL NOT** affect your grade or participation in the class or the volunteer program and cannot be tracked to a particular individual. If you choose not to participate in this evaluation, it will not affect your relations with the instructors or your grade. Your input is highly valued. **PLEASE RETURN THE EVALUATION IN CLASS TODAY.** Thank you for your participation.

Sincerely,



Mary H. Meyer
Extension Horticulturist

Master Gardener Core Course/ Hort 1003
Pre-Test, Spring 2000

FREQUENCIES = (#)

1. Food manufactured in the leaves moves to the roots through the:
 - a) xylem (2)
 - b) cambium (4)
 - c) phloem (5)
 - d) epidermis (1)
2. A perfect flower has:
 - a) both stamens and pistil (10)
 - b) both petals and sepals (4)
 - c) only petals
 - d) only stamens
3. The metabolic process where a plant uses carbohydrates produced during photosynthesis for growth is known as:
 - a) transpiration (6)
 - b) absorption (2)
 - c) respiration (5)
 - d) evapotranspiration (1)
4. Working garden soils when very wet destroys soil:
 - a) texture (7)
 - b) color
 - c) structure (7)
 - d) organic matter (1)
5. Most soil nutrients needed for plant growth are most available in a soil pH range of:
 - a) pH 8-9
 - b) pH 6-7 (13)
 - c) pH 3-4
 - d) pH 10-11 (1)
6. The amount of sand, silt, and clay in a soil refers to:
 - a) soil texture (4)
 - b) soil structure (9)
 - c) soil chemical composition (2)
 - d) soil pH
7. Failure of young fruit trees to bear fruit is related to a particular growth stage known as juvenility.
 - a) True (10)
 - b) False (5)
8. Which of the following series of plants would be good for a rotation plan for disease reduction?
 - a) squash, pumpkin, cucumber
 - b) corn, potatoes, beans (11)
 - c) tomato, eggplant, pepper (2)
 - d) broccoli, cauliflower, Brussels sprouts (2)

9. The purpose of mulch in the vegetable garden is to:
- conserve moisture (3)
 - keep the soil cool in summer
 - keep the produce clean
 - eliminate cultivation
 - all of the above (12)
10. Insects with piercing-sucking mouthparts cause damage by:
- removing plant juices (2)
 - causing growth distortions by injecting foreign enzymes
 - transmission of plant viruses
 - all of the above (12)
11. The best time to control a caterpillar defoliator is:
- when the caterpillars are most noticeable
 - whenever the damage is noticed (1)
 - when the damage is just beginning (1)
 - when the eggs are present (13)
12. What do springtails, fungus gnats, and slugs have in common?
- moisture control will help reduce their population (8)
 - they are not true insects (3)
 - none do any damage (1)
 - they are all predators (2)
13. Powdery mildews are easy to recognize by:
- the powdery white fungal growth on foliage (14)
 - lower leaf yellowing (1)
 - large spots with yellow borders
 - branch dieback
14. Viral diseases are spread primarily by:
- aphid feeding (6)
 - wireworm feeding
 - grasshopper feeding
 - wind (7)
15. To help prevent oak wilt disease in Minnesota DO NOT PRUNE oaks in :
- January, February, March (2)
 - April, May, June (5)
 - July, August, September (8)
 - October, November, December
16. If a homeowner decides on fertilizing their lawn once a year, which is the best time to fertilize?
- April - early June (7)
 - July
 - September (4)
 - November (3)

17. Leaving lawn clippings after mowing can account for:
- all the fertilizer a lawn needs in a year
 - one application of fertilizer a year (10)
 - two applications of fertilizer a year (2)
 - little nutritional value for a lawn (5)
18. A person wishing to establish a lawn in a sunny area with low maintenance should select:
- improved bluegrasses (5)
 - improved perennial ryegrasses (4)
 - common bluegrasses & fine leaved fescues (5)
 - annual or Italian ryegrasses & fine leaved fescues
19. The MOST limiting factor in growing indoor plants in Minnesota is:
- oxygen
 - water
 - light (12)
 - temperature (1)
20. When is the best time to fertilize a houseplant?
- when you want the plant to produce new growth (2)
 - as often as the label recommends
 - when the plant is growing actively (12)
 - whenever you see yellow foliage
21. Annual and perennial flowers have different needs, such as:
- annuals require more division
 - perennials need spring fertilization (3)
 - annuals need deadheading, but not perennials (2)
 - annuals require more water and fertilizer, perennials require division (9)
22. Winter mulch should be applied:
- after the first frost (5)
 - after the ground is frozen (8)
 - after all the leaves have fallen from silver maples
 - anytime after Halloween (1)
23. Which should NOT be included for hardening annuals prior to planting into the garden?
- moving the plants outdoors (1)
 - fertilizing (2)
 - withholding water (9)
 - lowering the temperature (2)
24. The best way to reduce animal pest problems is to:
- eliminate the pest's habitat (10)
 - use chemical repellants (1)
 - use plant repellants (3)
 - keep a large dog in the area

25. Moles primarily feed on:
- underground plant roots (1)
 - soil invertebrates (3)
 - smaller rodents
 - lawn clippings and humus
26. The reentry statement on a pesticide label states how much time must pass before:
- another pesticide may be applied (2)
 - produce may be harvested (2)
 - produce may be sold in interstate commerce (2)
 - people may reenter a treated area without proper clothing (6)
27. You should read the pesticide label before you:
- purchase a pesticide (1)
 - apply the pesticide
 - dispose of a pesticide
 - all of the above (13)
28. A good evergreen for hedges in Minnesota is:
- Northern Lights azaleas, *Rhododendron prinophyllum* hybrids
 - Arborvitae, *Thuja occidentalis* (13)
 - Lombardy poplar, *Populus nigra 'Italica'* (1)
 - American larch, *Larix laricina*
29. Renewal pruning is accomplished for older or overgrown shrubs by:
- cutting the plant back half way to the ground (2)
 - cutting the plant off at the ground line (1)
 - cutting 1/3 of the plant out this year and 1/3 out for each of the next two years (11)
 - cutting 1/3 of the plant out this year and 2/3 next year
30. Shigo indicates that trees form four walls or barriers to disease entering around a wound. Of all the walls, the last wall or barrier to form is the strongest disease barrier but the weakest structurally.
- True (5)
 - False (7)

*Please answer the following questions to the best of your ability.

1. Rate the importance you expect the following items will have in your learning experience in this class.

	Not Important			Important			Don't Know
a. instructor's lecture	1	2	3	4 (2)	5 (12)		6
b. handouts /text that accompanied lecture	1	2	3	4 (4)	5 (10)		6
c. reading the textbook	1	2	3 (2)	4 (1)	5 (11)		6
d. reading the extension publications	1	2	3 (1)	4 (4)	5 (4)		6
e. quizzes/examinations		1	2 (2)	3 (6)	4 (4)	5 (2)	6
f. interaction with classmates	1	2 (2)	3 (4)	4 (5)	5 (3)		6
g. other _____							

How comfortable are you in asking questions during class?

Not Comfortable 1 2 3 (5) 4 (3) 5 (5) Very Comfortable

3. What advantages of a face-to-face class do you perceive as important?

	Not Important		Important		
a. better learning resources (lectures, instructor-given, handouts or overheads)	1	2	3 (3)	4 (7)	5 (4)
b. structured learning environment (instructor/class provides the tempo for assignments and tasks.)	1	2 (1)	3 (1)	4 (8)	5 (4)
c. regular scheduled time (lectures/class participation are set and do not vary)	1	2 (1)	3 (3)	4 (6)	5 (4)
d. more guidance for when and how to studying	1	2 (1)	3 (5)	4 (4)	5 (4)
e. face to face interaction with other students	1	2 (1)	3 (3)	4 (6)	5 (4)
f. face to face interaction with the instructor	1	2	3 (2)	4 (6)	5 (6)

4. What advantages of an Internet class do you perceive as important?

	Not Important		Important		
a. better learning resources (class resources, other web sites, textbook)	1	2 (1)	3 (3)	4 (6)	5 (2)
b. more flexible pace of learning (you set your own pace)	1	2 (2)	3 (3)	4 (3)	5 (4)
c. greater choice of when to study (you access the course anytime, day or night)	1	2 (2)	3 (3)	4 (3)	5 (4)
d. increase self-reliance (a computer based system may improve your ability to work on you own)	1	2 (2)	3 (4)	4 (5)	5 (1)
e. improved computer literacy	1	2 (1)	3 (6)	4 (2)	5 (3)
f. more interaction with fellow classmates (access to send messages at anytime)	1	2 (6)	3 (4)	4 (2)	5
g. no driving or commuting time	1 (1)	2 (3)	3	4 (5)	5 (3)

5. What disadvantages of a face-to-face class do you perceive as important ?

	Not Important		Important		
a. poorer learning resources (the instructor and live presentation are inadequate)	1 (2)	2	3 (8)	4 (2)	5
b. class time is not flexible	1 (1)	2	3 (9)	4 (3)	5
c. limited interaction with other students outside of class	1 (2)	2 (2)	3 (6)	4 (2)	5
d. limited interaction with the instructor outside of class	1 (2)	2 (2)	3 (6)	4 (2)	5
e. no opportunity to use the Internet as a resource	1 (2)	2 (2)	3 (3)	4 (2)	5 (3)
f. driving/commuting time to get to class	1	2 (1)	3 (6)	4 (3)	5 (2)

6. What disadvantages of an Internet class do you perceive as important?

	Not Important		Important		
a. poorer learning resources (internet resources are inadequate)	1	2	3 (9)	4 (3)	5 (1)
b. an alienating learning experience (the impersonality of interacting with a computer)	1	2 (2)	3 (4)	4 (6)	5 (1)
c. technical frustration (understanding the computer and programs)	1 (2)	2 (1)	3 (4)	4 (3)	5 (3)
d. inadequate access to computer	1 (2)	2 (3)	3 (6)	4	5 (2)
e. loss of contact with instructor	1	2	3 (5)	4 (4)	5 (4)
f. loss of contact with other students	1	2 (3)	3 (4)	4 (2)	5 (4)

7. Choose the answer that best explains your experience with the following Internet tools. Use all responses that apply.

- | | | |
|-------------------------|----------------------|--|
| email | $a=9$
$e=4$ | A. I've used this tool before. |
| listserve/mailling list | $a=5$ $e=6$
$d=2$ | B. Technical aspects made it difficult to use. |
| chat room | $a=3$
$e=10$ | C. I had difficulty finding time to use this tool. |
| bulletin board | $a=5$ $e=7$
$c=1$ | D. I don't know what this tool does. |
| | | E. I have no experience using this tool. |
| | | F. Other _____ |

8. Please rate your level of satisfaction with the following:

	Unsatisfied			Satisfied		Have not used
a. email	1	2	3	4(1)	5(8)	6(4)
b. chat room	1	2	3	4(1)	5(1)	6(1)
c. listserve/mailling list	1	2	3	4(1)	5(3)	6(9)
d. bulletin board	1	2	3(1)	4(1)	5(3)	6(8)

9. Why did you decide to take the face-to-face class instead of the Internet class?

10. In **ADDITION TO** the 12 hours in class each week, how much time do you expect to spend studying for this class per week ?

- a. 0-1 hours
- b. 2-3 hours (5)
- c. 4-5 hours (6)
- d. 5-6 hours (4)

11. How much time do you spend commuting for this class each day?

- a. less than 1 hour (8)
- b. 1-2 hours (4)
- c. 2-3 hours (2)
- d. more than 3 hours

12. How many miles do you drive to and from the class?

- a. less than 10 miles (5)
- b. 10 - 25 miles (1)
- c. 26 - 40 miles (5)
- d. 60 + miles (4)

13. Your Age Group

- a. 18-25 (1)
- b. 26-35 (5)
- c. 36-45 (5)
- d. 46-60 (4)
- e. 60+ (4)

14. Gender:

- a. female (12)
- b. male (2)

15. Educational Background

- a. high school diploma (3)
- b. vocational/technical degree (4)
- c. college degree: (5) bachelor's degree (2) graduate

16. Why are you taking this class?

- a. to fulfill a degree requirement
- b. for university credit
- c. to become a University of Minnesota Extension Service Master Gardener (12)
- d. professional improvement
- e. personal improvement (2)
- e. other:

Thank you for your cooperation. Your input is very helpful.

Please feel free to add any additional comments here:

Master Gardener Core Course/ Hort 1003

Post-Test, Spring 2000

FREQUENCIES = (#)

1. Food manufactured in the leaves moves to the roots through the:
 - a) xylem (2)
 - b) cambium (3)
 - c) phloem (7)
 - d) epidermis (1)

2. A perfect flower has:
 - a) both stamens and pistil (13)
 - b) both petals and sepals (1)
 - c) only petals
 - d) only stamens

3. The metabolic process where a plant uses carbohydrates produced during photosynthesis for growth is known as:
 - a) transpiration (3)
 - b) absorption (4)
 - c) respiration (8)
 - d) evapotranspiration

4. Working garden soils when very wet destroys soil:
 - a) texture (5)
 - b) color
 - c) structure (9)
 - d) organic matter (1)

5. Most soil nutrients needed for plant growth are most available in a soil pH range of:
 - a) pH 8-9
 - b) pH 6-7 (15)
 - c) pH 3-4
 - d) pH 10-11

6. The amount of sand, silt, and clay in a soil refers to:
 - a) soil texture (9)
 - b) soil structure (6)
 - c) soil chemical composition
 - d) soil pH

7. Failure of young fruit trees to bear fruit is related to a particular growth stage known as juvenility.
 - a) True (1)
 - b) False (2)

8. Which of the following series of plants would be good for a rotation plan for disease reduction?
 - a) squash, pumpkin, cucumber
 - b) corn, potatoes, beans (13)
 - c) tomato, eggplant, pepper
 - d) broccoli, cauliflower, Brussels sprouts (2)

9. The purpose of mulch in the vegetable garden is to:
- conserve moisture
 - keep the soil cool in summer
 - keep the produce clean
 - eliminate cultivation
 - all of the above (15)
10. Insects with piercing-sucking mouthparts cause damage by:
- removing plant juices (1)
 - causing growth distortions by injecting foreign enzymes
 - transmission of plant viruses
 - all of the above (14)
11. The best time to control a caterpillar defoliator is:
- when the caterpillars are most noticeable
 - whenever the damage is noticed
 - when the damage is just beginning (7)
 - when the eggs are present (8)
12. What do springtails, fungus gnats, and slugs have in common?
- moisture control will help reduce their population (9)
 - they are not true insects (5)
 - none do any damage
 - they are all predators
13. Powdery mildews are easy to recognize by:
- the powdery white fungal growth on foliage (15)
 - lower leaf yellowing
 - large spots with yellow borders
 - branch dieback
14. Viral diseases are spread primarily by:
- aphid feeding (7)
 - wireworm feeding
 - grasshopper feeding (1)
 - wind (7)
15. To help prevent oak wilt disease in Minnesota DO NOT PRUNE oaks in :
- January, February, March
 - April, May, June (12)
 - July, August, September (3)
 - October, November, December
16. If a homeowner decides on fertilizing their lawn once a year, which is the best time to fertilize?
- April - early June (3)
 - July
 - September (9)
 - November (3)

17. Leaving lawn clippings after mowing can account for:
- a) all the fertilizer a lawn needs in a year
 - b) one application of fertilizer a year (14)
 - c) two applications of fertilizer a year
 - d) little nutritional value for a lawn (1)
18. A person wishing to establish a lawn in a sunny area with low maintenance should select:
- a) improved bluegrasses (8)
 - b) improved perennial ryegrasses (1)
 - c) common bluegrasses & fine leaved fescues (5)
 - d) annual or Italian ryegrasses & fine leaved fescues
19. The MOST limiting factor in growing indoor plants in Minnesota is:
- a) oxygen
 - b) water
 - c) light (15)
 - d) temperature
20. When is the best time to fertilize a houseplant?
- a) when you want the plant to produce new growth (2)
 - b) as often as the label recommends
 - c) when the plant is growing actively (13)
 - d) whenever you see yellow foliage
21. Annual and perennial flowers have different needs, such as:
- a) annuals require more division
 - b) perennials need spring fertilization (1)
 - c) annuals need deadheading, but not perennials (3)
 - d) annuals require more water and fertilizer, perennials require division (11)
22. Winter mulch should be applied:
- a) after the first frost (4)
 - b) after the ground is frozen (10)
 - c) after all the leaves have fallen from silver maples
 - d) anytime after Halloween (1)
23. Which should NOT be included for hardening annuals prior to planting into the garden?
- a) moving the plants outdoors
 - b) fertilizing (11)
 - c) withholding water (4)
 - d) lowering the temperature
24. The best way to reduce animal pest problems is to:
- a) eliminate the pest's habitat (14)
 - b) use chemical repellants
 - c) use plant repellants
 - d) keep a large dog in the area (1)

25. Moles primarily feed on:
- underground plant roots (4)
 - soil invertebrates (1)
 - smaller rodents
 - lawn clippings and humus
26. The reentry statement on a pesticide label states how much time must pass before:
- another pesticide may be applied
 - produce may be harvested (1)
 - produce may be sold in interstate commerce
 - people may reenter a treated area without proper clothing (14)
27. You should read the pesticide label before you:
- purchase a pesticide
 - apply the pesticide
 - dispose of a pesticide
 - all of the above (15)
28. A good evergreen for hedges in Minnesota is:
- Northern Lights azaleas, *Rhododendron prinophyllum* hybrids
 - Arborvitae, *Thuja occidentalis* (15)
 - Lombardy poplar, *Populus nigra 'Italica'*
 - American larch, *Larix laricina*
29. Renewal pruning is accomplished for older or overgrown shrubs by:
- cutting the plant back half way to the ground (1)
 - cutting the plant off at the ground line
 - cutting 1/3 of the plant out this year and 1/3 out for each of the next two years (13)
 - cutting 1/3 of the plant out this year and 2/3 next year (4)
30. Shigo indicates that trees form four walls or barriers to disease entering around a wound. Of all the walls, the last wall or barrier to form is the strongest disease barrier but the weakest structurally.
- True (8)
 - False (5)

*Please answer the following questions to the best of your ability.

1. Rate the importance the following items had in your learning experience in this class.

	Not Important			Important			Don't Know
a. instructor's lecture	1	2	3	4 (1)	5 (14)		6
b. handouts /text that accompanied lecture	1	2	3 (1)	4 (3)	5 (11)		6
c. reading the textbook	1	2	3 (1)	4 (5)	5 (9)		6
d. reading the extension publications	1	2	3 (3)	4 (2)	5 (8)		6 (1)
e. quizzes/examinations	1 (1)	2 (1)	3 (3)	4 (5)	5 (3)		6 (2)
f. interaction with classmates	1	2	3 (6)	4 (7)	5 (1)		6
g. other _____							

2. How comfortable were you in asking questions during class?

Not Comfortable 1 (1) 2 3 (3) 4 (2) 5 (9) Very Comfortable

3. What advantages of a face-to-face class do you perceive as important?

	Not Important		Important		
a. better learning resources (lectures, instructor-given, handouts or overheads)	1	2	3 (2)	4 (5)	5 (8)
b. structured learning environment (instructor/class provides the tempo for assignments and tasks.)	1	2 (2)	3 (1)	4 (6)	5 (6)
c. regular scheduled time (lectures/class participation are set and do not vary)	1 (1)	2	3 (4)	4 (6)	5 (4)
d. more guidance for when and how to studying	1 (2)	2 (1)	3 (3)	4 (4)	5 (5)
e. face to face interaction with other students	1	2 (1)	3 (4)	4 (8)	5 (2)
f. face to face interaction with the instructor	1	2	3 (3)	4 (4)	5 (8)

4. What advantages of an Internet class do you perceive as important?

	Not Important		Important		
a. better learning resources (class resources, other web sites, textbook)	1	2 (1)	3 (6)	4 (7)	5 (1)
b. more flexible pace of learning (you set your own pace)	1	2 (1)	3 (2)	4 (6)	5 (6)
c. greater choice of when to study (you access the course anytime, day or night)	1	2 (1)	3 (2)	4 (6)	5 (6)
d. increase self-reliance (a computer based system may improve your ability to work on you own)	1 (1)	2 (1)	3 (3)	4 (6)	5 (4)
e. improved computer literacy	1	2	3 (4)	4 (7)	5 (3)
f. more interaction with fellow classmates (access to send messages at anytime)	1 (2)	2 (4)	3 (6)	4 (3)	5
g. no driving or commuting time	1	2	3 (2)	4 (4)	5 (9)

5. What disadvantages of a face-to-face class do you perceive as important ?

	Not Important		Important		
a. poorer learning resources (the instructor and live presentation are inadequate)	1 (1)	2	3 (7)	4 (2)	5 (1)
b. class time is not flexible	1 (1)	2 (2)	3 (4)	4 (5)	5 (1)
c. limited interaction with other students outside of class	1 (1)	2 (3)	3 (7)	4 (3)	5
d. limited interaction with the instructor outside of class	1 (1)	2 (2)	3 (7)	4 (2)	5 (2)
e. no opportunity to use the Internet as a resource	1	2 (3)	3 (6)	4 (1)	5 (2)
f. driving/commuting time to get to class	1	2 (3)	3 (2)	4 (4)	5 (5)

6. What disadvantages of an Internet class do you perceive as important?

	Not Important		Important		
a. poorer learning resources (internet resources are inadequate)	1 (2)	2	3 (6)	4 (2)	5 (1)
b. an alienating learning experience (the impersonality of interacting with a computer)	1 (1)	2	3 (4)	4 (7)	5 (2)
c. technical frustration (understanding the computer and programs)	1 (1)	2 (2)	3 (1)	4 (3)	5 (7)
d. inadequate access to computer	1 (2)	2 (1)	3 (2)	4 (3)	5 (5)
e. loss of contact with instructor	1 (1)	2	3 (1)	4 (5)	5 (8)
f. loss of contact with other students	1 (1)	2	3 (4)	4 (6)	5 (3)

7. Choose the answer that best explains your experience with the following Internet tools. Use all responses that apply.

email	a=9 e=5	A. I've used this tool before.
listserve/mailling list	a=6 e=7 d=2	B. Technical aspects made it difficult to use.
chat room	a=3 e=11 c=1	C. I had difficulty finding time to use this tool.
bulletin board	a=5 e=10	D. I don't know what this tool does.
		E. I have no experience using this tool.
		F. Other _____

8. Please rate your level of satisfaction with the following:

	Unsatisfied		Satisfied			Have not used
a. email	1	2	3(1)	4(1)	5(6)	6(7)
b. chat room	1	2	3(1)	4(0)	5	6(13)
c. listserve/mailling list	1	2	3(1)	4(1)	5(3)	6(10)
d. bulletin board	1	2	3(2)	4(4)	5(12)	6

9. In **ADDITION TO** the 12 hours in class each week, how much time did you spend studying for this class?

- a. 0-1 hours (2)
- b. 2-3 hours (7)
- c. 4-5 hours (2)
- d. 5-6 hours (2)

10. How would you rate the workload of the class?

- a. Too much work (1)
- b. Just right (9)
- c. Too little work (3)

Comments:

11. My daily commute to and from class was 1.00 hours.

12. Based on the amount of time you spend commuting to and from this class, please rate how worthwhile it was for you to drive to this class.

Not Worthwhile			Very Worthwhile	
1	2	3	4(3)	5(12)

Comments:

ONLINE

UNIVERSITY OF MINNESOTA

Extension

S E R V I C E

College of
Agricultural, Food,
and Environmental
Sciences

DEPARTMENT OF
HORTICULTURAL SCIENCE

305 Alderman Hall
1970 Folwell Avenue
St. Paul, MN 55108-6007

PHONE
(612) 624-5300

FAX
(612) 624-4941

WEB
www.extension.umn.edu

December 20, 2000

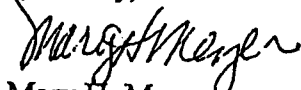
Dear Master Gardener Core Course/Horticulture 1003 Student,

You are invited to participate in a research study to evaluate the effectiveness of a traditional, face-to-face class with an Internet or online class. The information you provide is extremely important to the results of this study. The project is being conducted by Dr. Mary H. Meyer, assistant professor, and Karen Jeannette, teaching assistant and graduate student, Department of Horticultural Science. If you have questions please contact me at 612- 443-2460 x 639, or mmeyer@extension.umn.edu.

The purpose of the project is to compare online teaching with a traditional class. Also, student satisfaction, workload, and flexibility will be evaluated to provide a well-rounded view of the total learning experience. Please take a few minutes to complete the attached evaluation and pretest. Answer the questions to the best of your current ability, DO NOT use additional resources to answer the horticulture questions, or worry about the correct answer, we are interested in your current knowledge BEFORE the course.

Your input in this project will be kept private, in a locked file; only the researchers will have access to the records. DO NOT INCLUDE YOUR NAME on the evaluations, they will be kept anonymous. Your input WILL NOT affect your grade or participation in the class or the volunteer program and cannot be tracked to a particular individual. If you choose not to participate in this evaluation, it will not affect your relations with the instructors or your grade. Your input is highly valued. PLEASE RETURN THE EVALUATION IN THE ENCLOSED, SELF-ADDRESSED ENVELOPE as soon as possible and before January 7, 2000. Thank you for your participation.

Sincerely,



Mary H. Meyer
Extension Horticulturist

Master Gardener Core Course/ Hort 1003
Pre-Test, Spring 2000

FREQUENCIES = (#)

1. Food manufactured in the leaves moves to the roots through the:
 - a) xylem (17)
 - b) cambium (10)
 - c) phloem (18)
 - d) epidermis (7)

2. A perfect flower has:
 - a) both stamens and pistil (43)
 - b) both petals and sepals (9)
 - c) only petals
 - d) only stamens

3. The metabolic process where a plant uses carbohydrates produced during photosynthesis for growth is known as:
 - a) transpiration (19)
 - b) absorption (20)
 - c) respiration (11)
 - d) evapotranspiration (1)

4. Working garden soils when very wet destroys soil:
 - a) texture (25)
 - b) color (27)
 - c) structure
 - d) organic matter |

5. Most soil nutrients needed for plant growth are most available in a soil pH range of:
 - a) pH 8-9 (7)
 - b) pH 6-7 (41)
 - c) pH 3-4 (1)
 - d) pH 10-11 (3)

6. The amount of sand, silt, and clay in a soil refers to:
 - a) soil texture (21)
 - b) soil structure (26)
 - c) soil chemical composition (5)
 - d) soil pH

7. Failure of young fruit trees to bear fruit is related to a particular growth stage known as juvenility.
 - a) True (29)
 - b) False (22)

8. Which of the following series of plants would be good for a rotation plan for disease reduction?
 - a) squash, pumpkin, cucumber (3)
 - b) corn, potatoes, beans (44)
 - c) tomato, eggplant, pepper (4)
 - d) broccoli, cauliflower, Brussels sprouts (1)

9. The purpose of mulch in the vegetable garden is to:

- a) conserve moisture (8)
- b) keep the soil cool in summer
- c) keep the produce clean
- d) eliminate cultivation
- e) all of the above (44)

10. Insects with piercing-sucking mouthparts cause damage by:

- a) removing plant juices (1)
- b) causing growth distortions by injecting foreign enzymes (1)
- c) transmission of plant viruses (2)
- d) all of the above (45)

11. The best time to control a caterpillar defoliator is:

- a) when the caterpillars are most noticeable (1)
- b) whenever the damage is noticed (2)
- c) when the damage is just beginning (46)
- d) when the eggs are present (34)

12. What do springtails, fungus gnats, and slugs have in common?

- a) moisture control will help reduce their population (38)
- b) they are not true insects (8)
- c) none do any damage
- d) they are all predators (6)

13. Powdery mildews are easy to recognize by:

- a) the powdery white fungal growth on foliage (48)
- b) lower leaf yellowing (2)
- c) large spots with yellow borders (1)
- d) branch dieback (1)

14. Viral diseases are spread primarily by:

- a) aphid feeding (17)
- b) wireworm feeding (2)
- c) grasshopper feeding (2)
- d) wind (29)

15. To help prevent oak wilt disease in Minnesota DO NOT PRUNE oaks in :

- a) January, February, March (2)
- b) April, May, June (23)
- c) July, August, September (24)
- e) October, November, December (1)

16. If a homeowner decides on fertilizing their lawn once a year, which is the best time to fertilize?

- a) April - early June (21)
- b) July
- c) September (28)
- d) November (4)

17. Leaving lawn clippings after mowing can account for:

- a) all the fertilizer a lawn needs in a year (8)
- b) one application of fertilizer a year (22)
- c) two applications of fertilizer a year (7)
- d) little nutritional value for a lawn (14)

18. A person wishing to establish a lawn in a sunny area with low maintenance should select:

- a) improved bluegrasses (11)
- b) improved perennial ryegrasses (23)
- c) common bluegrasses & fine leaved fescues (16)
- d) annual or Italian ryegrasses & fine leaved fescues (2)

19. The MOST limiting factor in growing indoor plants in Minnesota is:

- a) oxygen
- b) water
- c) light (52)
- d) temperature (1)

20. When is the best time to fertilize a houseplant?

- a) when you want the plant to produce new growth (10)
- b) as often as the label recommends (13)
- c) when the plant is growing actively (28)
- d) whenever you see yellow foliage (2)

21. Annual and perennial flowers have different needs, such as:

- a) annuals require more division (3)
- b) perennials need spring fertilization (3)
- c) annuals need deadheading, but not perennials (2)
- d) annuals require more water and fertilizer, perennials require division (45)

22. Winter mulch should be applied:

- a) after the first frost (24)
- b) after the ground is frozen (23)
- c) after all the leaves have fallen from silver maples (1)
- d) anytime after Halloween (5)

23. Which should NOT be included for hardening annuals prior to planting into the garden?

- a) moving the plants outdoors (1)
- b) fertilizing (20)
- c) withholding water (31)
- d) lowering the temperature

24. The best way to reduce animal pest problems is to:

- a) eliminate the pest's habitat (33)
- b) use chemical repellants (2)
- c) use plant repellants (15)
- d) keep a large dog in the area (3)

25. Moles primarily feed on:

- a) underground plant roots (35)
- b) soil invertebrates (13)
- c) smaller rodents (2)
- d) lawn clippings and humus (2)

26. The reentry statement on a pesticide label states how much time must pass before:

- a) another pesticide may be applied (40)
- b) produce may be harvested (17)
- c) produce may be sold in interstate commerce
- d) people may reenter a treated area without proper clothing (24)

27. You should read the pesticide label before you:

- a) purchase a pesticide
- b) apply the pesticide
- c) dispose of a pesticide (1)
- d) all of the above (52)

28. A good evergreen for hedges in Minnesota is:

- a) Northern Lights azaleas, *Rhododendron prinophyllum* hybrids (5)
- b) Arborvitae, *Thuja occidentalis* (43)
- c) Lombardy poplar, *Populus nigra 'Italica'*
- d) American larch, *Larix laricina* (1)

29. Renewal pruning is accomplished for older or overgrown shrubs by:

- a) cutting the plant back half way to the ground (7)
- b) cutting the plant off at the ground line (4)
- c) cutting 1/3 of the plant out this year and 1/3 out for each of the next two years (39)
- d) cutting 1/3 of the plant out this year and 2/3 next year (1)

30. Shigo indicates that trees form four walls or barriers to disease entering around a wound. Of all the walls, the last wall or barrier to form is the strongest disease barrier but the weakest structurally.

- a) True (31)
- b) False (17)

Please answer the following questions to the best of your ability.

1. The online class will have several components, based on what you know today, rate the importance you expect the following items will have in your learning experience in this class.

	Not Important			Important			Don't Know
a. chat room	1 (9)	2 (11)	3 (7)	4 (11)	5 (6)	6 (9)	
b. mailing list	1 (5)	2 (10)	3 (8)	4 (10)	5 (10)	6 (9)	
c. textbook	1	2	3 (1)	4 (5)	5 (47)	6	
d. Extension publications	1	2	3 (1)	4 (10)	5 (42)	6	
e. site visits	1	2 (3)	3 (9)	4 (15)	5 (23)	6 (2)	
f. quizzes	1 (1)	2 (4)	3 (16)	4 (12)	5 (30)	6	
g. online slides	1	2	3 (4)	4 (18)	5 (30)	6 (1)	
h. video tapes/CD-ROM	1	2 (1)	3 (6)	4 (14)	5 (26)	6 (4)	

2. How comfortable are you in asking questions during class?

Not Comfortable 1 2 (2) 3 (10) 4 (15) 5 (26) 6 (4) Very Comfortable

3. What advantages of a face-to-face class do you perceive as important?

	Not Important		Important		
a. better learning resources (lectures, instructor-given, handouts or overheads)	1 (3)	2 (6)	3 (19)	4 (14)	5 (8)
b. structured learning environment (instructor/class provides the tempo for assignments and tasks.)	1 (8)	2 (7)	3 (14)	4 (15)	5 (5)
c. regular scheduled time (lectures/class participation are set and do not vary)	1 (12)	2 (9)	3 (15)	4 (13)	5 (2)
d. more guidance for when and how to studying	1 (4)	2 (11)	3 (19)	4 (9)	5
e. face to face interaction with other students	1 (3)	2 (9)	3 (9)	4 (23)	5 (7)
f. face to face interaction with the instructor	1 (2)	2 (4)	3 (13)	4 (17)	5 (5)

4. What advantages of an Internet class do you perceive as important?

	Not Important		Important		
a. better learning resources (class resources, other web sites, textbook)	1 (1)	2 (2)	3 (12)	4 (27)	5 (14)
b. more flexible pace of learning (you set your own pace)	1	2 (2)	3 (1)	4 (16)	5 (3)
c. greater choice of when to study (you access the course anytime, day or night)	1	2	3 (3)	4 (10)	5 (3)
d. increase self-reliance (a computer based system may improve your ability to work on you own)	1 (2)	2 (1)	3 (12)	4 (23)	5 (14)
e. improved computer literacy	1 (4)	2 (7)	3 (12)	4 (18)	5 (10)
f. more interaction with fellow classmates (access to send messages at anytime)	1 (2)	2 (11)	3 (7)	4 (18)	5 (3)
g. no driving or commuting time	1	2	3 (4)	4 (6)	5 (4)

5. What disadvantages of a face-to-face class do you perceive as important ?

	Not Important		Important		
a. poorer learning resources (the instructor and live presentation are inadequate)	1 (8)	2 (6)	3 (21)	4 (8)	5 (5)
b. class time is not flexible	1 (1)	2 (5)	3	4 (16)	5 (2)
c. limited interaction with other students outside of class	1 (5)	2 (8)	3 (22)	4 (8)	5 (5)
d. limited interaction with the instructor outside of class	1 (4)	2 (9)	3 (18)	4 (10)	5 (7)
e. no opportunity to use the Internet as a resource	1 (6)	2 (4)	3 (17)	4 (13)	5 (7)
f. driving/commuting time to get to class	1 (2)	2 (1)	3 (4)	4 (10)	5 (3)

6. What disadvantages of an Internet class do you perceive as important?

	Not Important		Important		
a. poorer learning resources (internet resources are inadequate)	1 (3)	2 (12)	3 (18)	4 (10)	5 (5)
b. an alienating learning experience (the impersonality of interacting with a computer)	1 (10)	2 (11)	3 (15)	4 (6)	5 (5)
c. technical frustration (understanding the computer and programs)	1 (12)	2 (13)	3 (10)	4 (8)	5 (5)
d. inadequate access to computer	1 (16)	2 (15)	3 (6)	4 (5)	5 (5)
e. loss of contact with instructor	1 (4)	2 (6)	3 (19)	4 (14)	5 (5)
f. loss of contact with other students	1 (4)	2 (11)	3 (18)	4 (17)	5 (3)

7. Choose the answer that best explains your experience with the following Internet tools. Use all responses that apply.

email	a = 47 b = 2	e = 1 f = 2	A. I've used this tool before.
listserve/mailling list	a = 23 b = 1 c = 2	d = 7 e = 14 f = 4	B. Technical aspects made it difficult to use.
chat room	a = 14 b = 1 c = 2	d = 3 e = 28 f = 3	C. I had difficulty finding time to use this tool.
bulletin board	a = 15 b = 1 c = 2	d = 5 e = 26 f = 2	D. I don't know what this tool does.
			E. I have no experience using this tool.
			F. Other _____

8. Please rate your level of satisfaction with the following:

	Unsatisfied	Satisfied	Have not used
a. email	1 2 3 (3) 4 (13) 5 (34)		6 (2)
b. chat room	1 (1) 2 (7) 3 (3) 4 (2) 5 (5)		6 (34)
c. listserve/mailling list	1 2 (2) 3 (10) 4 (5) 5 (8)		6 (27)
d. bulletin board	1 (1) 2 (1) 3 (7) 4 (3) 5 (6)		6 (34)

9. Why did you decide to take the Internet class rather than the face-to-face version?

10. How often do you plan to log on and work on the Internet class?

- every day (10)
- every evening (7)
- on the weekends
- whenever I have time, no set schedule (31)
- other: (4)

11. How much time do you expect to spend on this class per week?

- less than 3 hours
- 3-4 hours (10)
- 4-6 hours (24)
- 6-8 hours (15)

12. How far would you be willing to drive to take the face-to-face Master Gardener Core Course/Horticulture 1003 class?

- 25 miles (24)
 - 25-40 miles (17)
 - 40-60 miles (1)
 - 60+ miles (1)
 - would not drive (6)
 - unable to drive (3)
- other: _____

13. Your age group:

- 18-25 (2)
- 26-35 (6)
- 36-45 (6)
- 46-60 (25)
- 60+ (3)

14. Gender:

- a. female (44)
- b. male (87)

15. Educational background

- a. high school diploma (9)
- b. vocational/technical degree (11)
- c. college degree: (16) bachelor's degree (17) graduate

16. Why are you taking this class?

- a. to fulfill a degree requirement
- b. for university credit
- c. to become a University of Minnesota Extension Service Master Gardener (35)
- d. professional improvement (4)
- e. personal improvement (14)
- f. other:

Thank you for your cooperation. Your input is very helpful.

Please feel free to add any additional comments here:

Master Gardener Core Course/ Hort 1003 Online
Post-Test, Spring 2000

FREQUENCIES = (#)

1. Food manufactured in the leaves moves to the roots through the:
 - a) xylem (10)
 - b) cambium (7)
 - c) phloem (32)
 - d) epidermis (3)
2. A perfect flower has:
 - a) both stamens and pistil (52)
 - b) both petals and sepals (2)
 - c) only petals
 - d) only stamens
3. The metabolic process where a plant uses carbohydrates produced during photosynthesis for growth is known as:
 - a) transpiration (13)
 - b) absorption (4)
 - c) respiration (36)
 - d) evapotranspiration (1)
4. Working garden soils when very wet destroys soil:
 - a) texture (13)
 - b) color
 - c) structure (4)
 - d) organic matter
5. Most soil nutrients needed for plant growth are most available in a soil pH range of:
 - a) pH 8-9
 - b) pH 6-7 (54)
 - c) pH 3-4
 - d) pH 10-11
6. The amount of sand, silt, and clay in a soil refers to:
 - a) soil texture (40)
 - b) soil structure (14)
 - c) soil chemical composition
 - d) soil pH
7. Failure of young fruit trees to bear fruit is related to a particular growth stage known as juvenility.
 - a) True (34)
 - b) False (20)
8. Which of the following series of plants would be good for a rotation plan for disease reduction?
 - a) squash, pumpkin, cucumber (1)
 - b) corn, potatoes, beans (52)
 - c) tomato, eggplant, pepper
 - d) broccoli, cauliflower, Brussels sprouts (1)

9. The purpose of mulch in the vegetable garden is to:
- conserve moisture (1)
 - keep the soil cool in summer
 - keep the produce clean
 - eliminate cultivation
 - all of the above (53)
10. Insects with piercing-sucking mouthparts cause damage by:
- removing plant juices (6)
 - causing growth distortions by injecting foreign enzymes
 - transmission of plant viruses (1)
 - all of the above (47)
11. The best time to control a caterpillar defoliator is:
- when the caterpillars are most noticeable (10)
 - whenever the damage is noticed (3)
 - when the damage is just beginning (18)
 - when the eggs are present (23)
12. What do springtails, fungus gnats, and slugs have in common?
- moisture control will help reduce their population (47)
 - they are not true insects (5)
 - none do any damage
 - they are all predators (2)
13. Powdery mildews are easy to recognize by:
- the powdery white fungal growth on foliage (52)
 - lower leaf yellowing
 - large spots with yellow borders (2)
 - branch dieback
14. Viral diseases are spread primarily by:
- aphid feeding (19)
 - wireworm feeding (3)
 - grasshopper feeding (2)
 - wind (28)
15. To help prevent oak wilt disease in Minnesota DO NOT PRUNE oaks in :
- January, February, March (3)
 - April, May, June (45)
 - July, August, September (5)
 - October, November, December (1)
16. If a homeowner decides on fertilizing their lawn once a year, which is the best time to fertilize?
- April - early June (4)
 - July
 - September (43)
 - November (17)

17. Leaving lawn clippings after mowing can account for:
- all the fertilizer a lawn needs in a year (11)
 - one application of fertilizer a year (33)
 - two applications of fertilizer a year (2)
 - little nutritional value for a lawn (7)
18. A person wishing to establish a lawn in a sunny area with low maintenance should select:
- improved bluegrasses (21)
 - improved perennial ryegrasses (4)
 - common bluegrasses & fine leaved fescues (27)
 - annual or Italian ryegrasses & fine leaved fescues (1)
19. The MOST limiting factor in growing indoor plants in Minnesota is:
- oxygen
 - water
 - light (53)
 - temperature (1)
20. When is the best time to fertilize a houseplant?
- when you want the plant to produce new growth (2)
 - as often as the label recommends
 - when the plant is growing actively (52)
 - whenever you see yellow foliage
21. Annual and perennial flowers have different needs, such as:
- annuals require more division
 - perennials need spring fertilization (1)
 - annuals need deadheading, but not perennials (7)
 - annuals require more water and fertilizer, perennials require division (46)
22. Winter mulch should be applied:
- after the first frost (13)
 - after the ground is frozen (39)
 - after all the leaves have fallen from silver maples (1)
 - anytime after Halloween
23. Which should NOT be included for hardening annuals prior to planting into the garden?
- moving the plants outdoors (1)
 - fertilizing (15)
 - withholding water (38)
 - lowering the temperature
24. The best way to reduce animal pest problems is to:
- eliminate the pest's habitat (54)
 - use chemical repellants
 - use plant repellants
 - keep a large dog in the area

25. Moles primarily feed on:

- a) underground plant roots (15)
- b) soil invertebrates (37)
- c) smaller rodents
- d) lawn clippings and humus (2)

26. The reentry statement on a pesticide label states how much time must pass before:

- a) another pesticide may be applied
- b) produce may be harvested (1)
- c) produce may be sold in interstate commerce
- d) people may reenter a treated area without proper clothing (53)

27. You should read the pesticide label before you:

- a) purchase a pesticide (1)
- b) apply the pesticide
- c) dispose of a pesticide
- d) all of the above (53)

28. A good evergreen for hedges in Minnesota is:

- a) Northern Lights azaleas, *Rhododendron prinophyllum* hybrids (5)
- b) Arborvitae, *Thuja occidentalis* (47)
- c) Lombardy poplar, *Populus nigra 'Italica'* (1)
- d) American larch, *Larix laricina* (1)

29. Renewal pruning is accomplished for older or overgrown shrubs by:

- a) cutting the plant back half way to the ground (4)
- b) cutting the plant off at the ground line (3)
- c) cutting 1/3 of the plant out this year and 1/3 out for each of the next two years (46)
- d) cutting 1/3 of the plant out this year and 2/3 next year

30. Shigo indicates that trees form four walls or barriers to disease entering around a wound. Of all the walls, the last wall or barrier to form is the strongest disease barrier but the weakest structurally.

- a) True (36)
- b) False (17)

Please answer the following questions to the best of your ability.

1. Please rate the importance of the following items in your learning experience in this class:

	Not Important			Important			Don't Know
a. chat room	1(8)	2(9)	3(7)	4(12)	5(14)	6(3)	
b. mailing list	1(5)	2(6)	3(8)	4(16)	5(18)	6	
c. textbook	1	2(1)	3(1)	4(2)	5(48)	6(2)	
d. Extension publications	1	2(1)	3(2)	4(8)	5(4)	6(2)	
e. site visits	1(2)	2(3)	3(2)	4(4)	5(35)	6(10)	
f. quizzes	1	2(2)	3(6)	4(11)	5(35)	6(1)	
g. online slides	1(1)	2(6)	3(13)	4(10)	5(23)	6(1)	
h. video tapes/CD-ROM	1(3)	2(7)	3(12)	4(12)	5(10)	6(9)	

2. How comfortable were you in asking questions during class?

Not Comfortable 1 (2) 2 (8) 3 (17) 4 (9) 5 (17) Very Comfortable

3. What advantages of a face-to-face class do you perceive as important?

	Not Important		Important		
a. better learning resources (lectures, instructor-given, handouts or overheads)	1 (8)	2 (6)	3 (16)	4 (13)	5 (10)
b. structured learning environment (instructor/class provides the tempo for assignments and tasks.)	1 (17)	2 (12)	3 (7)	4 (10)	5 (7)
c. regular scheduled time (lectures/class participation are set and do not vary)	1 (23)	2 (10)	3 (9)	4 (8)	5 (3)
d. more guidance for when and how to studying	1 (20)	2 (9)	3 (13)	4 (8)	5 (3)
e. face to face interaction with other students	1 (7)	2 (10)	3 (10)	4 (19)	5 (7)
f. face to face interaction with the instructor	1 (7)	2 (6)	3 (9)	4 (17)	5 (14)

4. What advantages of an Internet class do you perceive as important?

	Not Important		Important		
a. better learning resources (class resources, other web sites, textbook)	1	2 (2)	3 (7)	4 (18)	5 (27)
b. more flexible pace of learning (you set your own pace)	1 (1)	2 (2)	3 (1)	4 (6)	5 (4)
c. greater choice of when to study (you access the course anytime, day or night)	1 (2)	2 (1)	3	4 (6)	5 (45)
d. increase self-reliance (a computer based system may improve your ability to work on you own)	1 (2)	2 (2)	3 (5)	4 (15)	5 (30)
e. improved computer literacy	1 (2)	2 (4)	3 (11)	4 (9)	5 (28)
f. more interaction with fellow classmates (access to send messages anytime)	1 (4)	2 (11)	3 (17)	4 (14)	5 (8)
g. no driving or commuting time	1 (1)	2	3 (1)	4 (8)	5 (44)

5. What disadvantages of a face-to-face class do you perceive as important ?

	Not Important		Important		
a. poorer learning resources (the instructor and live presentation are inadequate)	1 (4)	2 (5)	3 (21)	4 (14)	5 (6)
b. class time is not flexible	1 (1)	2 (2)	3 (7)	4 (19)	5 (25)
c. limited interaction with other students outside of class	1 (8)	2 (7)	3 (19)	4 (14)	5 (3)
d. limited interaction with the instructor outside of class	1 (3)	2 (5)	3 (17)	4 (18)	5 (4)
e. no opportunity to use the Internet as a resource	1 (3)	2 (4)	3 (11)	4 (11)	5 (24)
f. driving/commuting time to get to class	1 (1)	2 (1)	3 (2)	4 (11)	5 (39)

6. What disadvantages of an Internet class do you perceive as important?

	Not Important		Important		
a. poorer learning resources (internet resources are inadequate)	1 (14)	2 (8)	3 (11)	4 (14)	5 (6)
b. an alienating learning experience (the impersonality of interacting with a computer)	1 (16)	2 (12)	3 (5)	4 (6)	5 (4)
c. technical frustration (understanding the computer and programs)	1 (9)	2 (8)	3 (9)	4 (9)	5 (8)
d. inadequate access to computer	1 (5)	2 (8)	3 (9)	4 (15)	5 (6)
e. loss of contact with instructor	1 (8)	2 (9)	3 (14)	4 (13)	5 (9)
f. loss of contact with other students	1 (10)	2 (9)	3 (19)	4 (11)	5 (4)

7. Choose the answer that best explains your experience with the following Internet tools. Use all responses that apply.

- email $a=51$ $c=1$
 $b=1$ $f=1$
 $a=38$ $c=6$ $f=1$
 listserv/mailling list $b=2$ $e=7$
 $a=25$ $c=12$ $f=3$
 chat room $b=7$ $e=6$
 $a=15$ $d=5$
 bulletin board $b=3$ $e=22$
 $c=6$ $f=3$
- A. I've used this tool before.
 B. Technical aspects made it difficult to use.
 C. I had difficulty finding time to use this tool.
 D. I don't know what this tool does.
 E. I have no experience using this tool.
 F. Other _____

8. Please rate your level of satisfaction with the following:

	Unsatisfied	Satisfied	Did not used
a. email	1 (3) 2	3 (2) 4 (9) 5 (39)	6 (1)
b. chat room	1 (3) 2 (4)	3 (6) 4 (12) 5 (22)	6 (7)
c. listserv/mailling list	1 (2) 2 (4)	3 (7) 4 (12) 5 (23)	6 (5)
d. bulletin board	1 (1) 2 (3)	3 (9) 4 (10) 5 (2)	6 (28)

9. Please rate your level of agreement with the following statements about this course:

	Disagree	Agree
a. The design of the online course is user friendly	1 2 3 (5) 4 (11) 5 (1)	
b. The Navigation/Start Here link helped me understand where to start	1 2 (2) 3 (5) 4 (20) 5 (6)	
c. I never felt I found my way around the course	1 (3) 2 (3) 3 (4) 4 (2) 5 (5)	
d. I found my way around the course within the first 2 weeks	1 (6) 2 (4) 3 (1) 4 (15) 5 (6)	
e. I found my way around the course within the first 4-6 weeks	1 (5) 2 (4) 3 (5) 4 (7) 5 (10)	
f. I found information easily when I clicked on the site visits	1 (1) 2 (2) 3 (6) 4 (18) 5 (6)	
g. I was able to view the results of my quizzes at anytime with ease	1 (1) 2 3 (4) 4 (7) 5 (6)	

10. How would you rate the workload of the class?

- a. too much work (7)
- b. just right (44)
- c. too little work (1)

11. When did you usually work on this course?

- a. daytime (3)
- b. evenings (13)
- c. on the weekends (5)
- d. whenever I have time, no set schedule (33)
- e. other:

12. How much time did you spend on the class per week?

- a. less than hours (5)
- b. 3-4 hours (6)
- c. 4-6 hours (10)
- d. 6-8 hours (22)

Thank you. We appreciate your input. Please feel free to add any additional comments:

Table 1. Pre-test and post-test responses for horticulture questions from outstate, St. Paul, and online students in the Minnesota Gardener Core Course.

Questions	Correct Responses (%)					
	Pre-test			Post-test		
	Outstate	St. Paul	Online	Outstate	St. Paul	Online
1 Food manufactured in the leaves moves to the roots through the:	24	30	33	65	50	59
2 A perfect flower has:	71	77	80	86	86	96
3 The metabolic process where a plant uses carbohydrates produced during photosynthesis for growth is known as:	24	28	20	64	77	67
4 Working garden soils when very wet destroys soil:	49	59	50	67	89	76
5 Most soil nutrients needed for plant growth are most available in a soil range of:	83	89	76	97	100	100
6 The amount of sand, silt, and clay in a soil refers to:	65	48	48	27	11	26
7 Failure of young fruit trees to bear fruit is related to a particular growth stage known as juvenility.	60	48	54	81	77	63
8 Which of the following series of plants would be good for a rotation plan for disease reduction?	57	69	82	84	89	96
9 The purpose of mulch in the vegetable garden is to:	89	91	82	98	100	98
10 Insects with piercing -sucking mouthparts cause damage by:	84	85	83	94	100	87
11 The best time to control a caterpillar defoliator is:	22	27	30	60	44	33
12 What do springtails, fungus gnats, and slugs have in common?	44	65	70	71	69	87
13 Powdery mildews are easy to recognize by:	94	100	89	100	100	96
14 Viral diseases are spread primarily by:	27	44	32	38	17	35
15 To help prevent oak wilt disease in Minnesota DO NOT PRUNE oaks in:	48	57	43	83	72	83
16 If a homeowner decides on fertilizing their lawn once a year, which is the best time to fertilize?	44	57	52	76	45	80
17 Leaving lawn clippings after mowing can account for:	40	46	41	98	96	61
18 A person wishing to establish a lawn in a sunny area with low maintenance should select:	33	45	30	57	48	50
19 The MOST limiting factor in growing indoor plants in Minnesota is:	83	89	96	98	100	98
20 When is the best time to fertilize a houseplant?	62	68	52	95	100	96
21 Annual and perennial flowers have different needs, such as:	81	89	83	86	91	85
22 Winter mulch should be applied:	52	46	43	76	82	72
23 Which should NOT be included for hardening annuals prior to planting into the garden?	56	72	57	14	18	70
24 The BEST way to reduce animal pest problems is to:	60	72	61	95	98	100
25 Moles primarily feed on:	16	40	24	64	68	69
26 The reentry statement on a pesticide label states how much time must pass before:	38	46	44	89	95	98
27 You should read the pesticide label before you:	94	96	96	94	96	98
28 A good evergreen for hedges in Minnesota is:	83	94	80	89	93	87
29 Renewal pruning is accomplished for older or overgrown shrubs by:	73	72	72	86	98	85
30 Shigo indicates that trees form four walls of barriers to disease entering around a wound. Of all the walls, the last wall or barrier to form is the strongest disease barrier, but the weakest structurally.	49	55	57	67	76	67
Total	58	66	61	79	79	80

ST. PAUL

UNIVERSITY OF MINNESOTA

Extension

S E R V I C E

Master Gardener Program

MINNESOTA LANDSCAPE
ARBORETUM

3675 Arboretum Dr.
P.O. Box 39
Chanhassen, MN 55317-0039

PHONE
(612) 443-2460

FAX
(612) 443-2521

January 2000

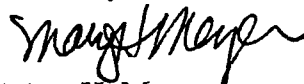
Dear Master Gardener Core Course/Horticulture 1003 Student,

You are invited to participate in a research study to evaluate the effectiveness of a traditional, face-to-face class with an Internet or online class. The information you provide is extremely important to the results of this study. The project is being conducted by Dr. Mary H. Meyer, assistant professor, and Karen Jeannette, teaching assistant and graduate student, Department of Horticultural Science. If you have questions please contact contact me at 612- 443-2460 x 639, or mmeyer@extension.umn.edu.

The purpose of the project is to compare online teaching with a traditional class. Also, student satisfaction, workload, and flexibility will be evaluated to provide a well-rounded view of the total learning experience. Please take a few minutes to complete the attached evaluation and pretest. Answer the questions to the best of your current ability, **DO NOT** use additional resources to answer the horticulture questions, or worry about the correct answer, we are interested in your current knowledge **BEFORE** the course.

Your input in this project will be kept private, in a locked file; only the researchers will have access to the records. **DO NOT INCLUDE YOUR NAME** on the evaluations, they will be kept anonymous. Your input **WILL NOT** affect your grade or participation in the class or the volunteer program and cannot be tracked to a particular individual. If you choose not to participate in this evaluation, it will not affect your relations with the instructors or your grade. Your input is highly valued. **PLEASE RETURN THE EVALUATION IN CLASS TODAY.** Thank you for your participation.

Sincerely,



Mary H. Meyer
Extension Horticulturist

**Master Gardener Core Course/ Hort 1003
Pre-Test, Spring 2000**

FREQUENCIES = (#)

1. Food manufactured in the leaves moves to the roots through the:
 - a) xylem (13)
 - b) cambium (18)
 - c) phloem (16)
 - d) epidermis (4)

2. A perfect flower has:
 - a) both stamens and pistil (41)
 - b) both petals and sepals (11)
 - c) only petals
 - d) only stamens (1)

3. The metabolic process where a plant uses carbohydrates produced during photosynthesis for growth is known as:
 - a) transpiration (23)
 - b) absorption (15)
 - c) respiration (15)
 - d) evapotranspiration (1)

4. Working garden soils when very wet destroys soil:
 - a) texture (17)
 - b) color
 - c) structure (32)
 - d) organic matter (5)

5. Most soil nutrients needed for plant growth are most available in a soil pH range of:
 - a) pH 8-9 (2)
 - b) pH 6-7 (46)
 - c) pH 3-4 (4)
 - d) pH 10-11

6. The amount of sand, silt, and clay in a soil refers to:
 - a) soil texture (23)
 - b) soil structure (26)
 - c) soil chemical composition (5)
 - d) soil pH

7. Failure of young fruit trees to bear fruit is related to a particular growth stage known as juvenility.
 - a) True (26)
 - b) False (28)

8. Which of the following series of plants would be good for a rotation plan for disease reduction?
 - a) squash, pumpkin, cucumber (1)
 - b) corn, potatoes, beans (36)
 - c) tomato, eggplant, pepper (11)
 - d) broccoli, cauliflower, Brussels sprouts (4)

9. The purpose of mulch in the vegetable garden is to:
- conserve moisture (4)
 - keep the soil cool in summer (1)
 - keep the produce clean
 - eliminate cultivation
 - all of the above (49)
10. Insects with piercing-sucking mouthparts cause damage by:
- removing plant juices (5)
 - causing growth distortions by injecting foreign enzymes (1)
 - transmission of plant viruses (2)
 - all of the above (40)
11. The best time to control a caterpillar defoliator is:
- when the caterpillars are most noticeable (4)
 - whenever the damage is noticed (4)
 - when the damage is just beginning (14)
 - when the eggs are present (30)
12. What do springtails, fungus gnats, and slugs have in common?
- moisture control will help reduce their population (35)
 - they are not true insects (10)
 - none do any damage (1)
 - they are all predators (8)
13. Powdery mildews are easy to recognize by:
- the powdery white fungal growth on foliage (54)
 - lower leaf yellowing
 - large spots with yellow borders
 - branch dieback
14. Viral diseases are spread primarily by:
- aphid feeding (23)
 - wireworm feeding (6)
 - grasshopper feeding (3)
 - wind (20)
15. To help prevent oak wilt disease in Minnesota DO NOT PRUNE oaks in :
- January, February, March (2)
 - April, May, June (30)
 - July, August, September (21)
 - October, November, December (1)
16. If a homeowner decides on fertilizing their lawn once a year, which is the best time to fertilize?
- April - early June (18)
 - July
 - September (30)
 - November (5)

17. Leaving lawn clippings after mowing can account for:

- a) all the fertilizer a lawn needs in a year (12)
- b) one application of fertilizer a year (25)
- c) two applications of fertilizer a year (11)
- d) little nutritional value for a lawn (6)

18. A person wishing to establish a lawn in a sunny area with low maintenance should select:

- a) improved bluegrasses (15)
- b) improved perennial ryegrasses (12)
- c) common bluegrasses & fine leaved fescues (24)
- d) annual or Italian ryegrasses & fine leaved fescues (2)

19. The MOST limiting factor in growing indoor plants in Minnesota is:

- a) oxygen
- b) water (1)
- c) light (47)
- d) temperature

20. When is the best time to fertilize a houseplant?

- a) when you want the plant to produce new growth (4)
- b) as often as the label recommends (13)
- c) when the plant is growing actively (36)
- d) whenever you see yellow foliage

21. Annual and perennial flowers have different needs, such as:

- a) annuals require more division
- b) perennials need spring fertilization (1)
- c) annuals need deadheading, but not perennials (5)
- d) annuals require more water and fertilizer, perennials require division (46)

22. Winter mulch should be applied:

- a) after the first frost (20)
- b) after the ground is frozen (25)
- c) after all the leaves have fallen from silver maples (2)
- d) anytime after Halloween (7)

23. Which should NOT be included for hardening annuals prior to planting into the garden?

- a) moving the plants outdoors (1)
- b) fertilizing (10)
- c) withholding water (39)
- d) lowering the temperature (4)

24. The best way to reduce animal pest problems is to:

- a) eliminate the pest's habitat (39)
- b) use chemical repellants (1)
- c) use plant repellants (14)
- d) keep a large dog in the area

25. Moles primarily feed on:

- a) underground plant roots (31)
- b) soil invertebrates (21)
- c) smaller rodents (1)
- d) lawn clippings and humus (1)

26. The reentry statement on a pesticide label states how much time must pass before:

- a) another pesticide may be applied (11)
- b) produce may be harvested (4)
- c) produce may be sold in interstate commerce (3)
- d) people may reenter a treated area without proper clothing (25)

27. You should read the pesticide label before you:

- a) purchase a pesticide (2)
- b) apply the pesticide
- c) dispose of a pesticide
- d) all of the above (51)

28. A good evergreen for hedges in Minnesota is:

- a) Northern Lights azaleas, *Rhododendron prinophyllum* hybrids (3)
- b) Arborvitae, *Thuja occidentalis* (50)
- c) Lombardy poplar, *Populus nigra 'Italica'*
- d) American larch, *Larix laricina* (1)

29. Renewal pruning is accomplished for older or overgrown shrubs by:

- a) cutting the plant back half way to the ground (8)
- b) cutting the plant off at the ground line (5)
- c) cutting 1/3 of the plant out this year and 1/3 out for each of the next two years (39)
- d) cutting 1/3 of the plant out this year and 2/3 next year (2)

30. Shigo indicates that trees form four walls or barriers to disease entering around a wound. Of all the walls, the last wall or barrier to form is the strongest disease barrier but the weakest structurally.

- a) True (28)
- b) False (22)

*Please answer the following questions to the best of your ability.

1. Rate the importance you expect the following items will have in your learning experience in this class.

	Not Important		Important			Don't Know	
a. instructor's lecture	1 (1)	2 (2)	3 (4)	4 (11)	5 (41)	6	
b. handouts /text that accompanied lecture	1 (1)	2 (2)	3 (3)	4 (1)	5 (42)	6	
c. reading the textbook	1 (1)	2 (2)	3 (3)	4 (20)	5 (30)	6	
d. reading the extension publications	1 (1)	2 (2)	3 (3)	4 (22)	5 (28)	6	
e. quizzes/examinations		1 (1)	2 (10)	3 (12)	4 (1)	5 (10)	6
f. interaction with classmates	1 (4)	2 (6)	3 (13)	4 (12)	5 (16)	6 (1)	
g. other _____							

2. How comfortable are you in asking questions during class?

Not Comfortable 1 (2) 2 (5) 3 (10) 4 (20) 5 (16) Very Comfortable

3. What **advantages of a face-to-face class** do you perceive as important?

	Not Important		Important		
a. <i>better learning resources</i> (lectures, instructor-given, handouts or overheads)	1	2	2 (2)	3 (9)	4 (21) 5 (22)
b. <i>structured learning environment</i> (instructor/class provides the tempo for assignments and tasks.)	1	2	3 (3)	3 (7)	4 (24) 5 (19)
c. <i>regular scheduled time</i> (lectures/class participation are set and do not vary)	1	2	1 (1)	3 (10)	4 (23) 5 (18)
d. <i>more guidance for when and how to studying</i>	1	2	3 (3)	2 (7)	3 (14) 4 (18) 5 (9)
e. <i>face to face interaction with other students</i>	1	2	1 (1)	2 (8)	3 (16) 4 (16) 5 (13)
f. <i>face to face interaction with the instructor</i>	1	2	3 (3)	3 (8)	4 (24) 5 (19)

4. What **advantages of an Internet class** do you perceive as important?

	Not Important		Important		
a. <i>better learning resources</i> (class resources, other web sites, textbook)	1	2	3 (3)	2 (13)	3 (15) 4 (12) 5 (7)
b. <i>more flexible pace of learning</i> (you set your own pace)	1	2	1 (1)	2 (6)	3 (4) 4 (9) 5 (16)
c. <i>greater choice of when to study</i> (you access the course anytime, day or night)	1	2	2 (2)	2 (4)	3 (17) 4 (12) 5 (15)
d. <i>increase self-reliance</i> (a computer based system may improve your ability to work on you own)	1	2	3 (3)	2 (6)	3 (22) 4 (11) 5 (8)
e. <i>improved computer literacy</i>	1	2	1 (10)	2 (4)	3 (15) 4 (12) 5 (8)
f. <i>more interaction with fellow classmates</i> (access to send messages at anytime)	1	2	1 (7)	2 (4)	3 (17) 4 (8) 5 (3)
g. <i>no driving or commuting time</i>	1	2	3 (3)	2 (3)	3 (11) 4 (13) 5 (25)

5. What **disadvantages of a face-to-face class** do you perceive as important ?

	Not Important		Important		
a. <i>poorer learning resources</i> (the instructor and live presentation are inadequate)	1	2	1 (9)	2 (10)	3 (10) 4 (11) 5 (5)
b. <i>class time is not flexible</i>	1	2	1 (10)	2 (6)	3 (13) 4 (14) 5 (8)
c. <i>limited interaction with other students outside of class</i>	1	2	1 (12)	2 (11)	3 (13) 4 (10) 5 (4)
d. <i>limited interaction with the instructor outside of class</i>	1	2	1 (9)	2 (10)	3 (12) 4 (12) 5 (7)
e. <i>no opportunity to use the Internet as a resource</i>	1	2	1 (10)	2 (10)	3 (15) 4 (8) 5 (6)
f. <i>driving/commuting time to get to class</i>	1	2	1 (5)	2 (10)	3 (8) 4 (13) 5 (12)

6. What **disadvantages of an Internet class** do you perceive as important?

	Not Important		Important		
a. <i>poorer learning resources</i> (internet resources are inadequate)	1	2	2 (2)	2 (7)	3 (15) 4 (13) 5 (8)
b. <i>an alienating learning experience</i> (the impersonality of interacting with a computer)	1	2	4 (4)	2 (2)	3 (9) 4 (13) 5 (18)
c. <i>technical frustration</i> (understanding the computer and programs)	1	2	1 (6)	2 (7)	3 (6) 4 (16) 5 (13)
d. <i>inadequate access to computer</i>	1	2	1 (10)	2 (7)	3 (6) 4 (3) 5 (11)
e. <i>loss of contact with instructor</i>	1	2	1 (1)	2 (2)	3 (7) 4 (19) 5 (20)
f. <i>loss of contact with other students</i>	1	2	1 (6)	2 (3)	3 (11) 4 (15) 5 (14)

7. Choose the answer that best explains your experience with the following Internet tools. Use all responses that apply.

email	$a = 42$	$d = 3$
	$b = 1$	$f = 4$
	$c = 1$	
listserve/mailling list	$a = 19$	$d = 4$
	$b = 1$	$e = 24$
	$c = 1$	$f = 2$
chat room	$a = 13$	$d = 2$
	$b = 2$	$e = 33$
	$c = 2$	$f = 2$
bulletin board	$a = 16$	$c = 36$
	$e = 1$	$f = 3$
	$d = 1$	

- A. I've used this tool before.
 B. Technical aspects made it difficult to use.
 C. I had difficulty finding time to use this tool.
 D. I don't know what this tool does.
 E. I have no experience using this tool.
 F. Other _____

8. Please rate your level of satisfaction with the following:

	Unsatisfied	Satisfied	Have not used
a. email	1 (1) 2	3 (5) 4 (5) 5 (32)	6 (7)
b. chat room	1 (2) 2 (3) 3 (7)	4 (1) 5 (4)	6 (32)
c. listserve/mailling list	1 (2) 2 (2) 3 (4)	4 (7) 5 (9)	6 (24)
d. bulletin board	1 (1) 2 (1) 3 (3) 4 (4)	5 (10)	6 (30)

9. Why did you decide to take the face-to-face class instead of the Internet class?

10. In **ADDITION TO** the 12 hours in class each week, how much time do you expect to spend studying for this class per week?

- a. 0-1 hours (2)
 b. 2-3 hours (22)
 c. 4-5 hours (1)
 d. 5-6 hours

11. How much time do you spend commuting for this class each day?

- a. less than 1 hour (31)
 b. 1-2 hours (22)
 c. 2-3 hours (1)
 d. more than 3 hours

12. How many miles do you drive to and from the class?

- a. less than 10 miles (12)
 b. 10 - 25 miles (23)
 c. 26 - 40 miles (15)
 d. 60 + miles (4)

13. Your Age Group

- a. 18-25 (1)
 b. 26-35 (12)
 c. 36-45 (18)
 d. 46-60 (22)
 e. 60+ (1)

14. Gender:

- a. female (38)
- b. male (13)

15. Educational Background

- a. high school diploma (4)
- b. vocational/technical degree (10)
- c. college degree: (24) bachelor's degree (14) graduate

16. Why are you taking this class?

- a. to fulfill a degree requirement (1)
- b. for university credit (2)
- c. to become a University of Minnesota Extension Service Master Gardener (37)
- d. professional improvement (4)
- e. personal improvement (7)
- e. other:

Thank you for your cooperation. Your input is very helpful.

Please feel free to add any additional comments here:

**Master Gardener Core Course/ Hort 1003
Post-Test, Spring 2000**

FREQUENCIES = (#)

1. Food manufactured in the leaves moves to the roots through the:
 - a) xylem (13)
 - b) cambium (8)
 - c) phloem (22)
 - d) epidermis (1)

2. A perfect flower has:
 - a) both stamens and pistil (38)
 - b) both petals and sepals (6)
 - c) only petals
 - d) only stamens

3. The metabolic process where a plant uses carbohydrates produced during photosynthesis for growth is known as:
 - a) transpiration (8)
 - b) absorption (2)
 - c) respiration (34)
 - d) evapotranspiration

4. Working garden soils when very wet destroys soil:
 - a) texture (5)
 - b) color
 - c) structure (39)
 - d) organic matter

5. Most soil nutrients needed for plant growth are most available in a soil pH range of:
 - a) pH 8-9
 - b) pH 6-7 (44)
 - c) pH 3-4
 - d) pH 10-11

6. The amount of sand, silt, and clay in a soil refers to:
 - a) soil texture (39)
 - b) soil structure (5)
 - c) soil chemical composition
 - d) soil pH

7. Failure of young fruit trees to bear fruit is related to a particular growth stage known as juvenility.
 - a) True (33)
 - b) False (10)

8. Which of the following series of plants would be good for a rotation plan for disease reduction?
 - a) squash, pumpkin, cucumber (1)
 - b) corn, potatoes, beans (39)
 - c) tomato, eggplant, pepper (4)
 - d) broccoli, cauliflower, Brussels sprouts

9. The purpose of mulch in the vegetable garden is to:

- a) conserve moisture
- b) keep the soil cool in summer
- c) keep the produce clean
- d) eliminate cultivation
- e) all of the above (44)

10. Insects with piercing-sucking mouthparts cause damage by:

- a) removing plant juices (2)
- b) causing growth distortions by injecting foreign enzymes
- c) transmission of plant viruses (10)
- d) all of the above (1)

11. The best time to control a caterpillar defoliator is:

- a) when the caterpillars are most noticeable (2)
- b) whenever the damage is noticed (2)
- c) when the damage is just beginning (19)
- d) when the eggs are present (21)

12. What do springtails, fungus gnats, and slugs have in common?

- a) moisture control will help reduce their population (29)
- b) they are not true insects (13)
- c) none do any damage
- d) they are all predators

13. Powdery mildews are easy to recognize by:

- a) the powdery white fungal growth on foliage (43)
- b) lower leaf yellowing
- c) large spots with yellow borders
- d) branch dieback

14. Viral diseases are spread primarily by:

- a) aphid feeding (17)
- b) wireworm feeding (1)
- c) grasshopper feeding (4)
- d) wind (29)

15. To help prevent oak wilt disease in Minnesota DO NOT PRUNE oaks in :

- a) January, February, March
- b) April, May, June (31)
- c) July, August, September (12)
- e) October, November, December

16. If a homeowner decides on fertilizing their lawn once a year, which is the best time to fertilize?

- a) April - early June (1)
- b) July
- c) September (19)
- d) November (22)

17. Leaving lawn clippings after mowing can account for:
- a) all the fertilizer a lawn needs in a year (1)
 - b) one application of fertilizer a year (42)
 - c) two applications of fertilizer a year (1)
 - d) little nutritional value for a lawn
18. A person wishing to establish a lawn in a sunny area with low maintenance should select:
- a) improved bluegrasses (17)
 - b) improved perennial ryegrasses (5)
 - c) common bluegrasses & fine leaved fescues (20)
 - d) annual or Italian ryegrasses & fine leaved fescues
19. The MOST limiting factor in growing indoor plants in Minnesota is:
- a) oxygen
 - b) water
 - c) light (44)
 - d) temperature
20. When is the best time to fertilize a houseplant?
- a) when you want the plant to produce new growth
 - b) as often as the label recommends
 - c) when the plant is growing actively (45)
 - d) whenever you see yellow foliage
21. Annual and perennial flowers have different needs, such as:
- a) annuals require more division (2)
 - b) perennials need spring fertilization (2)
 - c) annuals need deadheading, but not perennials
 - d) annuals require more water and fertilizer, perennials require division (41)
22. Winter mulch should be applied:
- a) after the first frost (7)
 - b) after the ground is frozen (37)
 - c) after all the leaves have fallen from silver maples
 - d) anytime after Halloween (1)
23. Which should NOT be included for hardening annuals prior to planting into the garden?
- a) moving the plants outdoors (2)
 - b) fertilizing (31)
 - c) withholding water (8)
 - d) lowering the temperature (4)
24. The best way to reduce animal pest problems is to:
- a) eliminate the pest's habitat (43)
 - b) use chemical repellants
 - c) use plant repellants (1)
 - d) keep a large dog in the area

25. Moles primarily feed on:

- a) underground plant roots (14)
- b) soil invertebrates (30)
- c) smaller rodents
- d) lawn clippings and humus

26. The reentry statement on a pesticide label states how much time must pass before:

- a) another pesticide may be applied (2)
- b) produce may be harvested
- c) produce may be sold in interstate commerce
- d) people may reenter a treated area without proper clothing (41)

27. You should read the pesticide label before you:

- a) purchase a pesticide (1)
- b) apply the pesticide (1)
- c) dispose of a pesticide
- d) all of the above (42)

28. A good evergreen for hedges in Minnesota is:

- a) Northern Lights azaleas, *Rhododendron prinophyllum* hybrids (1)
- b) Arborvitae, *Thuja occidentalis* (41)
- c) Lombardy poplar, *Populus nigra 'Italica'*
- d) American larch, *Larix laricina* (2)

29. Renewal pruning is accomplished for older or overgrown shrubs by:

- a) cutting the plant back half way to the ground
- b) cutting the plant off at the ground line (1)
- c) cutting 1/3 of the plant out this year and 1/3 out for each of the next two years (43)
- d) cutting 1/3 of the plant out this year and 2/3 next year

30. Shigo indicates that trees form four walls or barriers to disease entering around a wound. Of all the walls, the last wall or barrier to form is the strongest disease barrier but the weakest structurally.

- a) True (32)
- b) False (10)

*Please answer the following questions to the best of your ability.

1. Rate the importance the following items had in your learning experience in this class.

	Not Important				Important				Don't Know			
a. instructor's lecture	1	2	3	4	(2)	5	(4)	6				
b. handouts /text that accompanied lecture	1	2	3	(2)	4	(10)	5	(31)	6			
c. reading the textbook	1	2	(1)	3	(5)	4	(15)	5	(22)	6		
d. reading the extension publications	1	2	3	(9)	4	(13)	5	(20)	6	(1)		
e. quizzes/examinations	1	(1)	2	(8)	3	(12)	4	(6)	5	(13)	6	(1)
f. interaction with classmates	1	(3)	2	(4)	3	(10)	4	(10)	5	(11)	6	
g. other _____												

2. How comfortable were you in asking questions during class?

Not Comfortable 1 (7) 2 (13) 3 (5) 4 (8) 5 (8) Very Comfortable

3. What advantages of a face-to-face class do you perceive as important?

	Not Important		Important		
a. better learning resources (lectures, instructor-given, handouts or overheads)	1	2	3 (2)	4 (17)	5 (23)
b. structured learning environment (instructor/class provides the tempo for assignments and tasks.)	1	2 (2)	3 (4)	4 (18)	5 (18)
c. regular scheduled time (lectures/class participation are set and do not vary)	1	2 (2)	3 (6)	4 (14)	5 (20)
d. more guidance for when and how to studying	1 (6)	2 (12)	3 (11)	4 (9)	5 (4)
e. face to face interaction with other students	1 (3)	2 (2)	3 (10)	4 (21)	5 (6)
f. face to face interaction with the instructor	1 (2)	2 (2)	3 (8)	4 (17)	5 (13)

4. What advantages of an Internet class do you perceive as important?

	Not Important		Important		
a. better learning resources (class resources, other web sites, textbook)	1 (2)	2 (6)	3 (8)	4 (15)	5 (3)
b. more flexible pace of learning (you set your own pace)	1 (1)	2 (4)	3 (9)	4 (8)	5 (12)
c. greater choice of when to study (you access the course anytime, day or night)	1 (2)	2 (3)	3 (7)	4 (7)	5 (15)
d. increase self-reliance (a computer based system may improve your ability to work on you own)	1 (4)	2 (7)	3 (7)	4 (10)	5 (7)
e. improved computer literacy	1 (7)	2 (9)	3 (8)	4 (8)	5 (3)
f. more interaction with fellow classmates (access to send messages at anytime)	1 (8)	2 (7)	3 (12)	4 (6)	5 (1)
g. no driving or commuting time	1 (1)	2 (4)	3 (4)	4 (10)	5 (17)

5. What disadvantages of a face-to-face class do you perceive as important ?

	Not Important		Important		
a. poorer learning resources (the instructor and live presentation are inadequate)	1 (7)	2 (11)	3 (10)	4 (3)	5 (4)
b. class time is not flexible	1 (4)	2 (8)	3 (10)	4 (9)	5 (6)
c. limited interaction with other students outside of class	1 (6)	2 (9)	3 (11)	4 (6)	5 (4)
d. limited interaction with the instructor outside of class	1 (6)	2 (9)	3 (10)	4 (7)	5 (5)
e. no opportunity to use the Internet as a resource	1 (10)	2 (6)	3 (12)	4 (6)	5 (3)
f. driving/commuting time to get to class	1 (1)	2 (9)	3 (9)	4 (8)	5 (11)

6. What disadvantages of an Internet class do you perceive as important?

	Not Important		Important		
a. poorer learning resources (internet resources are inadequate)	1 (1)	2 (8)	3 (4)	4 (7)	5 (6)
b. an alienating learning experience (the impersonality of interacting with a computer)	1 (3)	2 (4)	3 (5)	4 (13)	5 (11)
c. technical frustration (understanding the computer and programs)	1 (7)	2 (3)	3 (5)	4 (11)	5 (10)
d. inadequate access to computer	1 (9)	2 (4)	3 (7)	4 (8)	5 (10)
e. loss of contact with instructor	1 (1)	2 (5)	3 (4)	4 (11)	5 (5)
f. loss of contact with other students	1 (4)	2 (3)	3 (5)	4 (7)	5 (7)

7. Choose the answer that best explains your experience with the following Internet tools. Use all responses that apply.

email	$a = 34$ $e = 4$	$f = 2$	A. I've used this tool before.
listserve/mailling list	$a = 23$ $b = 1$ $c = 4$	$e = 10$ $f = 2$	B. Technical aspects made it difficult to use. C. I had difficulty finding time to use this tool.
chat room	$a = 10$ $c = 3$ $d = 1$	$e = 24$ $f = 2$	D. I don't know what this tool does. E. I have no experience using this tool.
bulletin board	$a = 11$ $c = 2$	$e = 25$ $f = 2$	F. Other _____

8. Please rate your level of satisfaction with the following:

	Unsatisfied	Satisfied	Have not used
a. email	1 (1) 2 (1) 3 (2) 4 (8) 5 (18)	6 (8)	
b. chat room	1 (3) 2 (2) 3 (1) 4 (3) 5 (5)	6 (22)	
c. listserve/mailling list	1 (1) 2 3 (7) 4 (1) 5 (14)	6 (13)	
d. bulletin board	1 (1) 2 (1) 3 4 (3) 5 (5)	6 (25)	

9. In **ADDITION TO** the 12 hours in class each week, how much time did you spend studying for this class?

- a. 0-1 hours (2)
- b. 2-3 hours (17)
- c. 4-5 hours (12)
- d. 5-6 hours (8)

10. How would you rate the workload of the class?

- a. Too much work (3)
- b. Just right (32)
- c. Too little work (3)

Comments:

11. My daily commute to and from class was 1.0 hours.

12. Based on the amount of time you spend commuting to and from this class, please rate how worthwhile it was for you to drive to this class.

Not Worthwhile		Very Worthwhile	
1	2	3 (5)	4 (9) 5 (27)

Comments:


Master Gardener

UNIVERSITY OF MINNESOTA

Extension

A PROGRAM OF

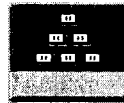
SERVICE

Horticulture 1003: Master Gardener

Welcome to the Master Gardener Course. Use the links below to access the various parts of the class.

If this is your first time using the class, check out the WebCT Online Tutorial [Module 0](#). This interactive tutorial shows you how to use the tools that you'll find in the course.

*** Be sure to fill out the [Final Course Evaluation](#) form. This form gives you a chance to give anonymous feedback on the course.


[Navigation/Start Here](#)

[Course Modules](#)

[Tools for the Course](#)

[Course Calendar](#)

[Course Syllabus](#)

[Tutor and Instructors](#)

[Online Gardening Resources](#)

[Technical Guides](#)

[Course Email Discussion](#)

[Course Bulletin Board](#)

The University of Minnesota is an equal opportunity employer.

© 2000, Regents of the University of Minnesota and the Department of Horticulture. All rights reserved.

This page last updated on October 26, 2000.

For questions or comments about this site, please contact [Mary H. Meyer](#)














 **Master Gardener**UNIVERSITY OF MINNESOTA
Extension
SERVICE

A PROGRAM OF ...

Online Modules

[\[Back Home\]](#)

Listed below are the links to the online modules. In each module, you will find a list of objectives and tasks as well as a printable version of these lists.

- | | |
|---|--|
|  Course Orientation |  Entomology |
|  Master Gardener Program: State and Local Overview |  Home Landscaping |
|  Herbaceous Plants |  Turfgrass |
|  Indoor Gardening |  Fruits and Vegetables |
|  Botany/General Horticulture |  Trees and Shrubs |
|  Plant Pathology |  Living With Wildlife |
|  Pesticide Safety and Use |  Advanced Course Modules |
|  Soils | |

© 1999, Regents of the University of Minnesota and the Master Gardener Program. All rights reserved.

[\[Home\]](#)

Master Gardener Program: State and Local Overview

Objectives

1. To understand the Master Gardener Program and the volunteer commitment.
2. To become familiar with your resource materials.
3. To meet other Master Gardeners from your county.
4. To meet the Extension Educator or Master Gardener Program Coordinator from your county.

Tasks

1. Read Appendix 1 on the Master Gardener Program in the Core Course Text. Carefully read the page entitled: University of Minnesota Extension Service policies regarding Master Gardeners.

Minnesota Master Gardener Internet Policy

Minnesota Master Gardeners must make recommendations based on University research. Information and recommendations from the internet must be taken only from Extension sites, preferably from Minnesota and the North Central region. Texas and Ohio have outstanding sites, which may or may not apply to Minnesota conditions. The internet now gives Master Gardeners access to more information than ever, however, only University Extension sites, especially those with similar climates should be used for recommendations.

2. Look over the publications in the Master Gardener Section of the Core Course Binder. On the MES Cluster Map locate your county and cluster; note the neighboring counties. Master Gardeners often meet in their home county. Non-metro counties may meet as a cluster.
3. Make an appointment to visit your home county Extension Office, or at least phone and introduce yourself. If possible, meet the Extension Educator and or Master Gardener Coordinator. Ask when the next Master Gardener meeting is, how often meetings are held in your county. Find out what projects Master Gardeners are currently working on, and for which projects you might like to volunteer. Ask where the Extension publications are kept and how Master Gardeners acquire new publications. By the end of the training, you should have identified the SUBJECTS you are most comfortable teaching and the TYPES of volunteer PROJECTS you will work on this year. It is important that when the training is finished, you have a "next step" such as a meeting and place to begin your volunteer work. Let your county coordinator or Mary Meyer, (State Coordinator, meyer023@umn.edu) know if you have questions this.

Think about your answers to these questions as you meet with your county Extension Educator and other Master Gardeners. Where do you think you may like to volunteer? Do you have an area or speciality in horticulture you especially like or have already taught others?

NOTE: You will not be expected to volunteer until you have completed the entire training. In fact, we do not encourage people to volunteer UNTIL they have completed the training. It is important that you understand all aspects of the program and have some background in each subject before you begin to answer questions and represent the University of Minnesota Extension Service.

WHAT COUNTS for volunteer work as a Master Gardener? Read the guidelines in the Powerpoint presentation in the beginning of Section 1 in the Appendix of the Core Course Textbook. Educational activities where you are teaching others should be your primary focus. County coordinators and Educators have the final say in what qualifies for volunteer hours.

4. Participate in the online email session the first week of class.
5. Complete the site visits listed below.

The [University of Minnesota Extension Service](#) home page contains a wealth of material for the public and is a great resource for Master Gardeners. Click on the link above and then under Topics, click on Gardening and Horticulture. Then follow the link for the Master Gardener program. This is a site you will want to bookmark for future use. Many of the references and sites for this online class are compiled under the heading Gardening Resources.

[Frequently Asked Questions](#) contains the most common horticulture questions by topic. Master Gardeners compiled this list from their experiences in Minnesota. This will help you as you begin to answer consumer gardening questions. You might want to set your browser's default home page to the URL for the University of Minnesota Extension Service or to the [Minnesota Master Gardener home page](#).

Go back to the [University of Minnesota Extension Service](#) home page and click on Search and enter the word "chrysanthemum." Click on the link for the publication Garden Chrysanthemums. Look at the many cultivars developed at the U that are the hardiest for our climate. You could print this list, but many of the publications like this are already in your maroon binder. You do not need to start printing them!!

Penn State has compiled a listing of [horticulture resources](#) by region. You may want to bookmark this site. Much of this EXTENSION information from the North Central region is applicable to Minnesota.

Perhaps you would like to write a garden column on timely tips for August. Look again at the [University of Minnesota Extension Service](#) home page. Scroll down to the links along the bottom of the site to RESOURCES and then click on NEWSLETTERS. Select the YARD AND GARDEN NEWS. This will bring up the current issue of an online newsletter you will want to read regularly. Written by the university specialists who are also instructors for this class, this newsletter highlights timely horticultural topics. Near the end of the current newsletter is a link to past issues so you can search the archives by month or topic.

You could also get to the Yard and Garden News by selecting the Yard and Garden logo

on the lower right side of the Extension homepage. Open the August issue from any year. Read and decide if the information fits your needs for your own article, then pull down the File menu and save as a document on your hard drive or to a disk. Name the file, save it and open it later in your word processing program and Voila! you have the beginnings of a newspaper article.

Let's look at what another state has done in a Master Gardening program with youth. Visit [Washington State University](#) and click on Success Stories. Click on Gardening Education for Youth, Growing with Plants. Read about this success story and note the number of youth impacted by the program. In your work and as you develop programs in the community, you will want to EVALUATE or measure the impact of your teaching. In [Minnesota Impacts](#) several programs involving Master Gardeners are listed. Search this database and see how the community and volunteers benefit from the programs.

Think about these questions:

- How do you measure program impact on a community or on program participants? Think of qualitative and quantitative measurements of program success. What difference did the program makes in the lives of the participants?

You will be influencing many people as you work in your community teaching horticulture. Thank You for your interest volunteering through horticulture !

6. Take the [MG: State and Local Overview Quiz](#).
7. Fill out the [MG: State and Local Overview Feedback Form](#).

© 2000, Regents of the University of Minnesota and the Department of Horticultural Science. All rights reserved.



Herbaceous Plants

Objectives

1. Explain several ways of using flowers in the home landscape.
2. Understand what the terms annual, perennial and bulb refer to and give several examples.
3. Describe soil preparation for annuals, bulbs and perennials.
4. Discuss selection of flowers for specific sites.
5. Understand preventative pest control for herbaceous plants.
6. Discuss several aspects of cultural management for the flower garden: watering, weeding, fertilization, etc.

Tasks

1. Read the section on Herbaceous Plants in the Core Course text.
2. Review the slides on Herbaceous Plants.
3. Visit the sites and answer the following questions via the online assignment form. You will want to print a copy of the tasks before you visit the sites below so that you can follow the instructor's directions regarding the sites.

On the web page of the American Iris Society, read the cultural information and look at the listing of the Top 100 Iris. This would be a good site to visit to get cultivar ideas if you want to purchase or recommend cultivars. Note that the recommendations come from all over the US. Many flowers have active plant societies, similar to the Iris Society, that you can join. The Minnesota Landscape Arboretum, and the Minnesota State Horticultural Society work with these plant societies. Answer these questions using the online assignment form above:

- When is the best time to dig and divide bearded Iris?
 - a. April to May
 - b. mid July/August
 - c. Septmember
 - d. June

The ridge planting method described shows that bearded iris prefer good drainage. They will not do well in heavy compacted or poorly drained soils.

At Michigan State's [Home Horticulture](#) site, read the section on peonies and answer the question.

- Ants are commonly found on peonies to:
 - a. open the flowers
 - b. get sugary exudate from the flower buds
 - c. aid Botrytis blight in dispersal
 - d. feed on honeydew excreted by aphids

Texas A&M has a [Wildflower](#) web site with good information about native plants. Look at the photo album and the growing information links on this homepage. Read the information on butterfly weed.

- What are the concerns about transplanting butterfly weed?
 - a. plants are easy to transplant
 - b. the taproot makes transplanting difficult
 - c. transplanting should be done when plants are two years old
 - d. transplanting results in multiple plants

Question for thought:

- Would butterfly weed be a good plant to seed where you want it to grow?

The Minnesota Master Gardeners compiled a list of [Frequently Asked Questions](#) that is posted on the public Minnesota Master Gardener Home Page. These questions represent many of the questions you will be asked by the public. Read under Flowers/Insects and answer these questions:

- What makes round dark holes on chrysanthemum foliage?
 - a. chysanthemum blight
 - b. fourlined plant bug
 - c. aster yellows
 - d. lady bugs
- Does this harm the chrysanthemum flowers?
 - a. yes
 - b. no

Visit the National Arboretum's [USDA Hardiness Zone Map](#) and answer the following questions.

- Most of Minnesota is in which hardiness zones:
 - a. 4 and 5
 - b. 3 and 4
 - c. 4a and 4b
 - d. 3a and 3b

Northwest Gardening, a gardening television series out of Oregon State University has a

Sights and Sounds page that includes a video clip. The video clip is about starting seeds. See the instructions for downloading the clip and then rate your experience with this clip in the online assignment form.

Instructions for downloading clip

Your browser should prompt you to download QuickTime(computer video software) if you do not already have it on your computer. You may need to reboot your computer after downloading. Once you have QuickTime,click on video clip #101 to view the video. Depending on the speed of your modem, it may take awhile to download. You may want to read part of the core course textbook while waiting.

- Please rate this method of online learning by choosing 1 answer that best describes how you feel. If you choose the last answer (other), please email the TA and mention why you chose this.
 - a. I liked watching the clip.
 - b. I liked watching the clip and would like to see more video clips throughout this course.
 - c. I watched, but the tech problems interfered with learning. Couldn't hear it or see it, poor quality.
 - d. I was unable to watch the video, don't know why.
 - e. other

Visit bulb.com for a wealth of information on bulbs. Under the Spring Flowering Bulbs section,look over the Chilling Facts and read the section on Ethylene. This is one of the few places to compare ethylene given off by fruits or sensitivity by bulbs. The "Bulb Guide" section is divided into spring and summer flowering bulbs. Many of the summer bulbs are not hardy for us, but here you will find resources to answer the questions you will be asked about these bulbs. Look up agapanthus and see how to carry it through the winter. Under FAQ you will find the answers to popular bulb questions. This website would be a good reference site for you to bookmark on your browser.

Erv Evans in North Carolina has compiled a massive list of [Flower Links on the Internet](#). This is another good bookmark that is a "yellow pages" for flowers. Many of the sites are universities and have good information, but remember that outside of Minnesota, recommendations may vary based on different climates.

4. Participate in the email and bulletin board discussions.
5. Review the publications in your large maroon binder, "Growing Perennials" and "Growing Annuals and Bulbs." Understand that most of the questions you will be asked on herbaceous plants are quite specific and you have several good resources available to you to look up this information. Also in your maroon binder are the [Yard and Garden briefs](#), which will answer many of your questions, many of these are also online.
6. Take the [Herbaceous Plants Quiz](#).
7. Fill out the [Herbaceous Plants Feedback Form](#).

Indoor Gardening

Objectives

1. Understand the critical role light plays in growing plants indoors.
2. Understand how and when to water houseplants.
3. Understand how and when to fertilize houseplants.
4. Understand the process of acclimatization and how this affects plants as they are moved from one location to another.
5. Be familiar with prevention and control of key insect pests of houseplants.
6. Be familiar with common methods of plant propagation.

Tasks

1. Read the section on Indoor Plants in the Core Course Text and review the publications in this section of the maroon binder.
2. Review the Indoor Plants slides.
3. Read the fact sheet on Houseplant Insect Control for suggestions on preventing and dealing with common houseplant pests. This fact sheet is also available online as are many of the Extension publications.
4. Visit the following sites and submit your answers to the questions using the online assignment form. You will want to print a copy of the tasks before you visit the sites below so that you can follow the instructor's directions regarding the sites.

The North Dakota State Extension Service has many publications online. Look at the bulletin House Plants: Proper Care and Problem Solving. Review the Cultural Considerations and Trouble Signs sections.

- When making your own potting soil, which combination of soil would NOT make good potting soil for houseplants?
 - a. 1 part garden loam, 1 part peat, and 1 part perlite
 - b. 1 part garden loam, 1 part leaf mold, and 1 part sand
 - c. 1 part garden loam, 1 part well-rotted manure, and 1 part perlite
 - d. exclusively garden loam

- What may cause finely specked leaves on house plants?
 - a. Spider mites
 - b. Scale
 - c. Springtails
 - d. Whiteflies

The Star Tribune put together a virtual tour of [Como Conservatory](#) . If you haven't been to Como Conservatory, check it out. It's a great place to visit to learn more about indoor plants. *To start the tour, click continue of the left of the picture. If you scroll down slightly you'll get to choose one of several rooms to visit. Start with the Palm room and answer the following question:

What plant in the Palm Room is a member of a family that is found on every continent, except Antarctica and contains 30,000 species?

- a. freesias
- b. orchids
- c. cyclamen
- d. snapdragons

This site hosted by [Prairienet](#) includes lots of good information on indoor gardening and houseplants.

5. Participate in the email discussion on [Indoor Plants](#).
6. Take the [Indoor Gardening Quiz](#).
7. Fill out the [Indoor Gardening Feedback Form](#).

© 2000, Regents of the University of Minnesota and the Department of Horticultural Science. All rights reserved.



Botany and General Horticulture

Objectives

1. Be able to identify the basic parts of a plant.
2. Gain an understanding of how a plant functions.
3. Appreciate how environmental factors affect plant growth and development.
4. Become familiar with the basic botanical terms used in plant classification.

Tasks

1. Read the section on Botany/General Horticulture in the Core Course Text.
2. Review the Extension publications in the appropriate section of the Core Course Publications or maroon notebook.
3. Review the Botany and General Horticulture slides.
4. Visit the following sites and answer the questions related to them using the online assignment form. You will want to print a copy of the tasks before you visit the sites below so that you can follow the instructor's directions regarding the sites.

Not sure what a botanical term means or how to pronounce a botanical term? Visit Oregon State's Glossary of Botany Terminology with audio capabilities.

Question for thought:

- What does the term totipotent mean and how do you pronounce it? (If your computer has speakers, you may be able to click on the blue sound symbol next to the word to hear the correct pronunciation.)

Ohio State has a Master Gardener Botany Class online. You may enjoy looking at this and comparing it to the Texas site below. Much of this information is also in your textbook. The quiz questions and tips in Ohio's site are written especially for Master Gardeners. Read the section on Plant Processes and answer the following question using the above online assignment form:

- The metabolic process where a plant uses carbohydrates produced during photosynthesis for growth is known as:
 - a. transpiration
 - b. absorption
 - c. respiration

d. evapotranspiration

Texas A&M University's [Botany 201](#) web site includes graphics in the form of line drawings on basic taxonomy and plant morphology. Visit this site and look at various sections, such as monocots and dicots, to answer the following questions.

- What type of veins do monocots have?
 - a. parallel
 - b. net-veined

- Rhizomes, corms and bulbs are all types of underground stems.
 - a. true
 - b. false

- Monocots have only fibrous root systems.
 - 1. true
 - 2. false

5. Participate in the email discussion on Botany and General Horticulture.
6. Take the [Botany and General Horticulture Quiz](#).
7. Fill out the [Botany and General Horticulture Feedback Form](#).

© 2000, Regents of the University of Minnesota and the Department of Horticultural Science. All rights reserved.



Plant Pathology

Objectives

1. Learn the basic principles of plant pathology.
2. Develop a knowledge of the microorganisms involved with plant disease and the infection process.
3. Identify skills necessary for plant disease diagnosis, and be able to conduct real-life diagnoses.
4. Be able to distinguish between symptoms of living and non-living organisms, and obtain accurate information for plant disease diagnosis.
5. Understand basic control measures and management practices.

Tasks

1. Read the Plant Pathology chapter in the Core Course text.
2. Review the Plant Pathology slides.
3. Visit the following sites and answer the questions related to them using the online assignment form

Oregon State University hosts an online guide to Plant Disease Control.

1. Click on plant index and type: **APPLE**
2. Click on **APPLE SCAB** and read the information about this disease.
3. **Questions:**
 - What is the scientific name of the causal organism of Apple Scab?
 - a. Podosphaera leucotricha
 - b. Venturia inaequalis
 - c. Malus species
 - d. Phytophthora infestans
 - The apple scab fungus infects apple fruit.
 - a. True
 - b. False
 - Which of the following cultural practices for apple scab are applicable to

homeowners in Minnesota?

- a. Rake and dispose of fallen leaves in autumn.
- b. Plant scab resistant cultivars
- c. Use urea to aid in fall decomposition of leaves.
- d. Prune branches to increase air circulation and reduce moisture in the canopy.
- e. A, B, and C
- f. All of the Above

- o Fungicide applications should begin when the tips of green leaves appear.
 - a. True
 - b. False
- o Monitoring temperature and most importantly moisture can identify infection periods for apple scab and reduce fungicide use.
 - a. True
 - b. False

1. Click on plant index and type **Potato**

2. Click on **potato late blight** and read the information about this disease.

3. **Questions:**

- o The fungus causing late blight enters the plant by:
 - a. Directly penetrating the leaf cuticle
 - b. Entering the leaf stomates
 - c. Penetrating the roots
 - d. Both A and B
- o Cultural control measures for managing late blight include:
 - a. Eliminate cull piles and control volunteer plants
 - b. Use disease-free certified seed
 - c. Harvest plants when soil is wet
 - d. All of the above
 - e. A and B
- o Monitoring or scouting plants regularly for disease is a critical step in late blight disease management?
 - a. True
 - b. False
- o What is the significance of a second mating type for the late blight fungus?
 - a. The fungus may become sterile.
 - b. The fungus may be able to survive in the soil, as well as plant debris.
 - c. The disease would be isolated to the Pacific Northwest.
 - d. None of the above.

1. Click on plant index and type **spruce** .

2. Click on **spruce and Rhizosphaera needle cast** and read the information about this disease.

3. **Questions:**

- Are there any varieties of spruce that are immune to Rhizosphaera needle cast?
 - a. Yes
 - b. No

- Where are the pycnidia (spore-producing structures) of the fungus, Rhizosphaera, found on the tree?
 - a. On the needles
 - b. Inside of the stomata on the needle
 - c. On the tree trunk
 - d. On the cones

- Which of the following is the most susceptible to Rhizosphaera needle cast?
 - a. Norway spruce
 - b. White spruce
 - c. Colorado Blue spruce
 - d. True fir

- Which one of the following symptoms is NOT associated with Rhizosphaera needle cast?
 - a. Needles turn yellow
 - b. Needles turn brown or purple
 - c. The disease begins near the base of the tree
 - d. Needles drop in spring and summer
 - e. The disease kills the shoot and buds

- To effectively control Rhizosphaera needle cast, apply the fungicide Daconil one time when the new growth (shoot) is 0.5" to 1.5" in length.
 - a. True
 - b. False

- 1. Click on plant index and type **rose**.
- 2. Click on **rose and rose mosaic** and read the information about this disease.
- 3. **Questions:**
 - Which of the following diseases mimic rose mosaic?
 - a. Black spot
 - b. Powdery mildew
 - c. Downy mildew
 - d. All of the Above
 - e. None of the above

 - Which of the following is NOT listed as a leaf disease of rose?
 - a. Downy mildew
 - b. Black spot
 - c. Botrytis blight
 - d. Rust

Visit this [Plant Pathology](http://webct.umn.edu/web-ct/courses/HORT1003/mod06/print06.htm) site at the University of Wisconsin-Madison.

1. Click on **Courses**
2. Click on **PP300 - Introduction to Plant Pathology** .
3. Click on **Symptoms and Signs (pathogen structures)** and read the following text.
4. **Questions:**
 - o How are signs of a disease different than symptoms?
 - a. A sign is an observable change in the physiological or morphological development of a plant, while a symptom is a physical structure of the causal agent.
 - b. A symptom is an observable change in the physiological or morphological development of a plant, while a sign is a physical structure of the causal agent.
 - o Which of the following steps from Koch's Postulate is incorrect (choose one):
 - a. The pathogen must be associated with all plants showing symptoms.
 - b. The pathogen must be isolated and identified
 - c. Healthy plants need to be inoculated with the pathogen, and the same symptoms as observed in the original plants need to reappear.
 - d. Isolation of any pathogen from plants inoculated in step 3.
 - o Symptoms occurring on a particular plant are specific to the pathogen infecting that plant.
 - a. True
 - b. False

Visit the [Plant Disease Image Library](#) at the University of Georgia.

1. Click on **Plant Library**
2. Click on **Turf**
3. Click on **Bentgrass and then Anthracnose**
4. Read the following information.
5. **Questions:**
 - o The disease, anthracnose, can be found on turf in Minnesota. Which of the following is a diagnostic feature of the organism causing anthracnose?
 - a. It doesn't produce spores
 - b. It produces specialized structures called setae (black spines)
 - c. Reddening of the turfgrass
 - d. None of the above

Visit the [USDA Forest Service](#) web site.

1. Click on **On-line Pubs**
2. Click on **alphabetized list**
3. Search for and click on "**How to grow and maintain a healthy birch tree**"
4. **Questions:**
 - o Which of the following sites is recommended for a birch tree?

- a. Hot and dry
- b. Cool, moist, and partial shade
- c. Well-drained soil and full sun
- d. Any of the above

- 4. Participate in the email discussion on Plant Pathology.
- 5. Take the Plant Pathology Quiz.
- 6. Fill out the Plant Pathology Feedback Form.

© 2000, Regents of the University of Minnesota and the Department of Horticultural Science. All rights reserved.



Pesticide Safety and Use

Objectives

1. Learn how to read a pesticide label.
2. Be able to describe proper pesticide storage.
3. Learn how to safely mix and apply pesticides.
4. Understand the role of a Master Gardener in making pesticide recommendations.

Tasks

1. Read the section on Pesticide Safety and Use in the Core Course text.
2. Watch the video "Read the Label" which is in your local Extension office.
3. Visit the sites and answer the multiple choice question via the [online assignment form](#).

As Master Gardeners you represent the University of Minnesota when making recommendations. Pesticide recommendations are the most difficult part of your work. Please remember two important things:

- a. Make recommendations only in accordance with the label. Any other use **NOT LISTED ON THE LABEL IS ILLEGAL** and you should **MAKE NO RECOMMENDATIONS** not listed on the pesticide label.
- b. Recommendations must be based on university research, not your own ideas. If you say, I have done such and such, it comes across as a recommendation. This is a very difficult area, so stick to university recommendations. Adhering to the Extension fact sheets and bulletins is very important.

Read the information at [North Dakota State University](#) on using pesticides. Pay special attention to the section on Pesticide Alternatives. Too often questions come to Master Gardeners when pesticides are the only answer left whereas months before prevention was still possible.

What does the signal word indicate for a pesticide?

- a. the toxicity of the product
- b. the time to wait until harvest
- c. the time to wait for reentry into the garden

d. the formulation of the product

Visit the [Minnesota Health, Environmental, and Pesticide Safety HELPS](#) web site. This site is part of the University of Minnesota. Information on Pesticide Applicator Training, the commercial licensing program, is here. Additional information, such as EPA regulations, signs and symptoms of pesticide poisoning, fertilizer and pesticide containment guidelines, are also listed here.

Read [Guidelines for Safely Laundering Pesticide-Contaminated Clothing](#). Wearing proper clothing while applying pesticides is important. The label tells you what protective clothing is necessary for the particular pesticide, but washing the clothing is often not covered. Read this brochure for suggestions on washing clothing exposed to pesticides. Although written for farmers, homeowners can learn from this as well.

When washing clothing used for pesticide application,

- a. use bleach and hot water
- b. use a special detergent just for pesticide removal
- c. use 1 1/2 times the normal amount of detergent and presoak or prerinse the clothes
- d. dispose of your clothes after applying pesticides, because they cannot be properly cleaned

The [University of Nebraska](#) has an online "quiz" on pesticides. There is a great deal of information here. Look over these three sections.

XV The pesticide label

XX Pesticide recommendations

XXI Best management practices

- When can you reenter the area where pesticides have been used?
 - a. after 12 hours
 - b. as soon as the foliage is dry
 - c. read the label to determine the correct reentry period
 - d. after four days have passed

You may be asked for specific information on a particular pesticide. What happens to the pesticide? What is the residual in the soil or on a plant? How toxic is the pesticide to fish or wildlife? [Exttoxnet](#) is a site that contains detailed information on a long list of commonly used pesticides. You may want to bookmark this site for future reference. The information is easy to understand and cites references.

Search the word glyphosate in this database. Glyphosate is the chemical name for Round-Up, the non-selective herbicide. Look at how high the LD/50 is. Read the section on environmental fate of glyphosate.

What happens to Round-Up after you apply it?

- a. microbes are primarily responsible for the breakdown of the product

- b. it dissolves in water and moves offsite
- c. it binds to the soil particles and has a long residual
- d. volatilization (turns to gas) or photodegradation (breakdown by light) destroy most of the chemical

4. Participate in the email discussion on Pesticide Use and Safety.
5. Take the Pesticide Safety and Use Quiz.
6. Fill out the Pesticide Safety and Use Feedback Form.

© 2000, Regents of the University of Minnesota and the Department of Horticultural Science. All rights reserved.



Soils

Objectives

1. Be able to describe how soils are formed.
2. Be able to explain the difference between soil texture and structure.
3. Define the composition of the ideal garden soil.
4. Explain the relationship between soil components, such as water, air, and nutrients.
5. Be able to list the nutrients needed by plants, their source and the significance of nitrogen, phosphorus and potassium to plants.
6. Define pH and its significance to plants and be able to describe how pH can be modified over a range of soils.
7. Describe what fertilizer is and how nutrients get into plants and the factors that regulate their availability.
8. Calculate how much fertilizer is needed to achieve the desired amount of nutrients per unit area.
9. Describe how to construct a compost pile and successfully produce compost.

Tasks

1. Read the section on Soils in the Core Course text.
2. Review Soils slides.
3. Visit the following sites and answer the questions related to them using the online assignment form. You may want to print a copy of the tasks before you visit the sites to follow the instructor's directions.

The Department of Soil Science at Universiti Putra Malaysia has a great list of Online Soil Resources. Scroll down to the Garden Soil Management link which goes to Ohio State. Click on this and then click on Raised Bed Gardening fact sheet.

- Which of the following is NOT true of raised beds?
 - a. higher yields due to close spacing because walkways are not necessary
 - b. decreased soil compaction, increased water and oxygen for plant roots
 - c. raised bed soil warms up quicker in the spring
 - d. rodent problems are greater because the plants are closer together

This web site, [Function of soil and soil profiles](#), is a look at soils through a horticulturalists point of view. Look over the soils profile information and answer the following questions:

- The C horizon is sometimes called the parent material.
 - a. true
 - b. false
- The A horizon has the most organic matter which usually gives it a darker color.
 - a. true
 - b. false
- The B horizon is actually the best for growing plants.
 - a. true
 - b. false

Determining fertilizer [calculations](#) is explained at this site from North Carolina.

How much 25-4-6 fertilizer would have to be applied to 1,000 sq. ft. of lawn to deliver 1 lb. of N per 1000 sq. ft.?

- a. 5 lbs
- b. 10 lbs
- c. 4 lbs
- d. 7 lbs

[Soil Testing](#) is an interactive slide show produced by Rutgers University that shows how to take a soil test. You may also want to look at other slide shows once you visit this site.

Use this link to obtain specific information for submitting a soil sample to the department of [Soil, Water and Climate](#) at the University of Minnesota. This site also shows you how to take a soil sample and where to send it.

This [soil testing](#) site has some interesting comments, although it is mainly for western gardeners.

Which of these is NOT a valid reason for having your soil tested ?

- a. when plants appear stunted, discolored or are growing poorly
- b. when you move to a new home and need information to begin gardening
- c. to measure physical properties, such as soil compaction
- d. testing every year when you are monitoring pH change

This site from [Oregon State](#) has a number of interesting topics. Soil pH, raised beds, soil test info, and more. Read the page on How to Improve Clay Soils. Often gardeners want a short-

term,easy solution to improving soil structure, however as this article states, it is a long-term project.

The best way to improve the structure of clay soils is:

- a. add 4" of sand each spring
- b. add 2-3" of organic matter each fall
- c. add black dirt
- d. rototill the area each year to incorporate subsoil

What can [Minnesota Earthworms](#) do for your soil? Find the answers to common questions about earthworms, as well as information about their biology and history at this site.

4. Participate in the email discussion about soils.



5. Complete the [Soils Quiz](#).

6. Fill out the [Soils Feedback Form](#).

© 2000, Regents of the University of Minnesota and the Department of Horticultural Science. All rights reserved.



A: Introduction to Entomology

Objectives

1. Learn the general biology and anatomy of insects.
2. Learn to recognize the common orders of insects.
3. Learn insect life cycles.
4. Understand the philosophy of integrated pest management (IPM).
5. Learn how to ask questions to diagnose insect problems.

Tasks

1. Read the section on Introduction to Entomology in the core course text.
2. Review the [Introduction to Entomology](#) slides.
3. Visit the following sites and submit your answers to the Introduction to Entomology questions using the [online assignment form](#). You will want to print a copy of the tasks before you visit the sites below so that you can follow the instructor's directions regarding the sites.



A basic understanding of insects is important before discussing insect pest management. Read the general introduction about entomology at the [Wonderful World of Insects](#) site (If a pop-up window appears, close it.) Then, click on "The Insects Home page", then click on the orange button at the top titled, "Classification" and then under the title "Introduction to Taxonomy" click on Key to the Insect Orders.

What body parts are important to identify different orders of insects?

- a) Legs and Abdomen
- b) Wings and Mouthparts
- c) Compound Eyes and Antennae
- d) Tarsi and Cerci

It is also important to understand insect life cycles before discussing insect pest management. Visit [Entomology for Beginners](#) at Hein Bijlmakers--a Dutch and English language web site.

Which type of metamorphosis is the most common?

- a) Incomplete metamorphosis
- b) Complete metamorphosis
- c) No metamorphosis
- d) Semi-metamorphosis

Penn State has an excellent web site discussing integrated pest management (IPM)

Pesticides do NOT play a role in IPM:

- a) True
- b) False

4. Participate in the email discussion on Introduction to Entomology.
5. Watch the video on general entomology.
6. Complete the Entomology Quiz once you have gone through all three of the Entomology sections.
7. Fill out the Entomology Feedback Form after you've finished all three entomology sections.

© 2000, Regents of the University of Minnesota and the Department of Horticultural Science. All rights reserved.



B: Garden and Landscape Entomology

Objectives

1. Be able to recognize different types of insect damage to plants.
2. Learn some common garden and landscape insects.
3. Understand the management of garden and landscape insects.

Tasks

1. Read the Extension publications in the appropriate section of the Core Course Publications or maroon notebook.
2. Review the Garden and Landscape Entomology slides.
3. Visit the following sites. Notice there is no need to send in your answers to the course tutor this time. You will want to print a copy of the tasks before you visit the sites below so that you can follow the instructor's directions regarding the sites.

Visit the Michigan State University web site on plant damage caused by insects.



- What insect most likely caused the injury you see in the accompanying image (above)?
 - a. caterpillar
 - b. aphids
 - c. white grubs
 - d. fly maggots

This is one of several good sites discussing pest management of insects in gardens or landscapes. See Ohio State's Extension Factsheet on IPM for the Home Vegetable Garden and answer the following question.



- The insect in the accompanying image (left) was found in a yard on a rose bush. What is it?
 - a. injurious sawfly larva
 - b. injurious leaf beetle larva

- c. beneficial lady beetle larva
- d. innocuous fly larva

For turf insects, read Managing Lawn and Turf Insects from the University of Minnesota Extension service.

Visit Common Insect Pests of Trees and Shrubs in North Dakota on the NDSU Extension Service web site.

Visit the Home Entomology Publications from the University of Minnesota Yard and Garden Line to learn some of the common garden and landscape insects.

Using the Yard and Garden Line as a resource to find information, answer the following questions.

- During late April, someone asks you about bees nesting in their garden. They want to know what the chance for stings are and what action they should take. You answer:
 - a. stings are rare, no action is necessary, the bees go away on their own in a short time.
 - b. stings are sometimes common, sprinkle the areas with water to discourage the bees, they sometimes go away on their own.
 - c. stings are common, pour insecticidal soap into the burrows to kill the bees otherwise they remain most of the summer.
 - d. stings are very common, dust an insecticide into the nest entrances to kill the bees, once they are established they remain all summer.

4. Participate in the email discussion on Garden and Landscape Entomology.
5. Take the Entomology Quiz after you've finished reading through all three of the entomology sections.
6. Fill out the Entomology Feedback Form after you've finished all three entomology sections.

© 2000, Regents of the University of Minnesota and the Department of Horticultural Science. All rights reserved.



C: Structural Entomology

Objectives

1. Identify common insect pests associated with homes in Minnesota.
2. Understand how to manage insect pests associated with homes.

Tasks

1. Read the Extension publications in the appropriate section of the Core Course Publications or maroon notebook.
2. Review the Structural Entomology slides.
3. Visit the following sites and submit your answers to the Structural Entomology questions using the online assignment form. You will want to print a copy of the tasks before you visit the sites below so that you can follow the instructor's directions regarding the sites.

Florida has a general discussion about IPM of structural pests.

Find the answer to the next two questions by using Iowa State's Iowa Insect Information Notes site. This site has information about insects found in and around homes. Their structural insects pests are very similar to those in Minnesota.

- During spring, a caller describes many tiny purplish or rust colored bugs all over the windows and walls. What are they most likely describing?
 - a. bird mites
 - b. clover mites
 - c. psuedoscorpions
 - d. springtails
- Which of the following insects can reproduce indoors?
 - a. larder beetles
 - b. boxelder bugs
 - c. cluster flies
 - d. all of the above

Using the Yard and Garden Line homepage as a resource, answer the following question.

- During August, you receive an insect call. The caller describes the pest as 3/4 inch long with a brown body with white markings. It has particularly large back legs

with part of it being dilated (enlarged). The insect is seen during the day and moves slowly. It occasionally flies from around the house. The caller never sees any more than a few at a time. They are concerned that it is a cockroach. You tell them it is a:

- a. cockroach
- b. masked hunter
- c. western conifer seed bug
- d. ground beetle

4. Participate in the email discussion on Structural Entomology.
5. Watch the video on Household Insects
6. Take the Entomology Quiz after you've finished reading through all three of the entomology sections.
7. Fill out the Entomology Feedback Form after you've finished all three entomology sections.

© 2000, Regents of the University of Minnesota and the Department of Horticultural Science. All rights reserved.



Home Landscaping

Objectives

1. Understand landscape design process.
 2. Understand the importance of site evaluation relative to plant selection.
 3. Understand the importance of good landscape design relative to sustainability.
 4. Learn essential elements of design principles.
-

Tasks

1. Read the sections on Lawn Care in the Core Course text.
2. Review the slides on Home Landscaping
3. Visit the following sites and submit your answers to the questions using the online assignment form. You will want to print a copy of the tasks before you visit the sites below so that you can follow the instructor's directions regarding the sites.

Millions of dollars are spent each year designing, implementing, and maintaining urban landscapes. Unfortunately, long-term problems are caused when these processes are not carried out properly. Problems can be avoided or reduced by utilizing sustainable landscape practices. The Sustainable Urban Landscape Information Series contains information to help design, implement and maintain landscapes. Read the main site introduction; then look at the sequence of steps in doing a Base Plan for a landscape. Consider doing a Site Analysis for your own property. At the bottom of the home page, look at the additional links to other landscaping information. The case study of the lakefront property on Crystal Lake is an interesting project. The SULIS site is one you will refer to many times if you work with landscape design.

1. Although VISUALLY PLEASING is the first consideration most people think of in landscape design, which of the other four should be number one in consideration for sustainable designs:
 - a. Maintainable
 - b. Functional
 - c. Environmentally sound
 - d. Cost effective

4. Participate in the email discussion this week.
5. Take the Home Landscape Quiz.
6. Fill out the Home Landscape Feedback Form.

© 2000, Regents of the University of Minnesota and the Department of Horticultural Science. All rights reserved.



Turfgrass

Objectives

1. Understand the basis requirements for growing a lawn.
 2. List and explain the steps in starting a new lawn.
 3. List the steps in turf renovation and overseeding.
 4. Learn the difference between the major cool season grasses such as fescue, perennial ryegrass and Kentucky bluegrass and the warm season grasses.
 5. Understand basic culture and maintenance techniques such as watering, fertilization, aeration, and weed control in lawn care.
 6. Understand major pest problems for lawns (weeds) not usually insects and diseases in Minnesota.
-

Tasks

1. Read the sections on Lawn Care in the Core Course text.
2. Review the slides on Turfgrass
3. Visit the following sites and submit your answers to the questions using the online assignment form. You will want to print a copy of the tasks before you visit the sites below so that you can follow the instructor's directions regarding the sites.

Visit Integrated Pest Management for Turf Managers from the University of Illinois and answer the following questions.

- Which of the following would NOT be a true statement regarding the implementation of a turfgrass IPM program?
 - a. An increase in stressed turf due to reduce inputs and care can be expected
 - b. A reduction in the use of pesticides that usually results in budget savings
 - c. Requires frequent monitoring to detect and assess potential severity of problems and what if any corrective action may be needed
 - d. The key to any successful turfgrass IPM program is knowledge
- Turfgrass selection is an important component of IPM. When renovating or establishing a lawn which of the following would NOT be considered an important turfgrass selection criteria?

- a. what is the anticipated use of the turf area
 - b. how much light will the area receive
 - c. what level of care is the area most likely to receive
 - d. how tall will the grass variety grow
- When pesticides are needed in an IPM program, which of the following would be a desirable pesticide characteristic influencing your choice of product?
 - a. the pesticide has a very broad range of pests controlled and is sure to kill the pest invading the turf
 - b. it will last a long time in the environment therefore minimizing the need to reapply frequently
 - c. it is the least toxic to non-target organisms, the environment and the applicator
 - d. the more expensive the product the greater its effectiveness regardless of what the pest is

Visit [SULIS](#) (Sustainable Urban Landscape and Information Series) and click on Lawn Care, then scroll down and click on Growth Development and answer the following questions.

- Which of the following growth patterns would NOT be true for cool season turfgrasses?
 - a. Initiation of root growth precedes shoot growth in the spring
 - b. Flowering generally occurs in the late summer to early fall
 - c. There are two peak periods of shoot growth: spring and late summer
 - d. Root growth rates are least during the early to mid-summer (June-July) periods of the year
- When choosing a turfgrass to quickly fill in an area with the least amount of seed required, which of the following turfgrass growth habits would be the most appropriate? (Hint: there may be more than one correct answer)
 - a. stoloniferous
 - b. rhizomatous
 - c. bunch-type
 - d. tuberous

Visit this site about [shady lawns](#) from the University of Illinois and answer the following questions.

- What are the best adapted cool season turf grasses for shady conditions?
 - a. fine fescues
 - b. perennial ryegrass
 - c. most species of Kentucky bluegrass
 - d. tall fescue
- Which of the following practices should you AVOID when caring for a shady lawn?
 - a. raise your mowing height
 - b. increase the amount of nitrogen fertilizer

- c. water infrequently, but deeply
- d. reduce traffic

Visit [SULIS](#) again, and this time click on Lawn Care then scroll down and click on Weed Management.

- Which of the following is NOT a useful way to classify weeds?
 - a. longevity of the plant (e.g., annual, perennial, biennial, etc.)
 - b. morphology (e.g., monocots or dicots)
 - c. season of peak growth (e.g., warm-season, cool-season)
 - d. alphabetically (e.g., crabgrass . . . dandelion . . . plantain . . . etc.)
- Pre-emergent herbicides are most commonly applied for control of which lawn weed types?
 - a. cool-season perennial broadleaf weeds
 - b. warm season perennial grasses
 - c. annual grassy weeds
 - d. cool season perennial grassy weeds

Visit [Control of Broadleaf Weeds in the Lawn](#) from Iowa State University's Horticulture and Home Pest News.

- Depending on the situation, which of the following would NOT be considered as a possible weed control strategy for controlling established perennial broadleaf lawn weeds?
 - a. pulling or digging out
 - b. using an herbicide
 - c. maintaining a healthy lawn
 - d. using a dishwashing soap and water mixture
- Which of the following practices could lead to POOR results when using an herbicide for controlling perennial broadleaf weeds in the lawn?
 - a. treating the weeds in late summer or early fall
 - b. mowing within 24 hours of an application
 - c. watering within 24 to 48 hours before it is applied
 - d. using a product specifically labeled for controlling the target weed

Visit the web version of the factsheet, [Fertilizing Lawns](#) by the University of Minnesota.

- Your plans are to apply a nitrogen containing fertilizer at the rate of 0.7 lbs. N / M (Note: the letter M is often used to designate 1000 ft² in turf applications.) You have selected an 18-6-14 fertilizer as per a recent soil test recommendation. This product comes in 10 pound bags. You have also carefully measured your lawn and know that there is 6800 ft² of area. How many pounds of your selected fertilizer product will be required to cover this entire area at the desired rate of nitrogen application (i.e. 0.7 lbs. N / M)?

- a. 3 lbs.
 - b. 26 lbs.
 - c. 12 lbs
 - d. 42 lbs.
- Based on the above result, how many bags of the product will you need to purchase?
 - a. 1
 - b. 2
 - c. 3
 - d. 4
 - The application precision of a properly calibrated drop spreader would be important for all but which of the following situations?
 - a. Fertilizer application through large, unobstructed, open lawn areas
 - b. Fertilizer application near curbs
 - c. Fertilizer application near flower bed and shrub borders
 - d. Fertilizer application near water bodies

Weeds are the major pest in home lawns in Minnesota. [Rutgers University](#) has a nice site with weed photos for identification.

- This site is organized alphabetically, what other information is the most helpful in weed identification:
 - a. Flower color, leaf shape, growth habit
 - b. Fall color, seed size, type of root
 - c. Means of propagation, number of stamens, insect damage
 - d. Age of plant, soil pH, soil drainage

Homeowners are often troubled by moss in their lawn. [Penn State](#) has a fact sheet that explains how to combat this problem. Some people like moss growing in their lawn.

- Moss is usually found in lawns with:
 - a. Ground ivy, dandelions and chickweed
 - b. Construction fill and gypsum
 - c. Low fertility with few nutrients to support lawn grasses
 - d. Acidic soils with standing water
 - e. Heavy shade with high organic matter

4. Contact your home county Extension office to watch either video "Low Maintenance Turfgrass" or "Care of Turfgrass."
5. Participate in the email discussion this week.

6. Take the Turfgrass Quiz.
7. Fill out the Turfgrass Feedback Form.

© 2000, Regents of the University of Minnesota and the Department of Horticultural Science. All rights reserved.



Fruits and Vegetables

Objectives

1. Understand the importance of site selection, soil preparation and proper planting for a successful fruit or vegetable garden.
2. Understand the importance of and identify successful varieties, cultivars and rootstocks of fruits and vegetables for Minnesota.
3. Understand crop rotation, mulching, pruning, watering, fertilization and other techniques for successful food production.
4. Be aware of the major insect and disease problems of fruits and vegetables for Minnesota.

Tasks

1. Read the sections on Fruits and Vegetables in the Core Course text.
2. Review the Fruits and Vegetables slides.
3. Visit the following sites and answer the associated questions via the online assignment form.

Your maroon binder has several publications on home food production. Adjacent states also have bulletins and information on fruits and vegetables which is applicable to our growing conditions.

Read "Growing Grapes for Home Use" from the University of Minnesota Extension Service. Pay special attention to the section titled "Caring for Grapes" and answer the following question.

When is the best time to prune grapes?

- a. just after harvest
- b. when the leaves are newly expanded
- c. late winter or early spring
- d. year round

You can also look at Iowa State's Horticulture and Home Pest News It has a good description of pruning grapes.

Fruit set on tomatoes is related to temperature.

What is the minimum night temperature tomatoes need to set fruit?

- a. 40 degrees F.
- b. 55 degrees F.
- c. 65 degrees F.
- d. 70 degrees F.

South Dakota State has a nice publication on asparagus planting. Planting depth is critical for long term production of asparagus.

What is the best final planting depth for the crowns?

- a. 1-2 inches
- b. 3-4 inches
- c. 4-6 inches
- d. 8-10 inches

North Dakota's Ask Extension has a publication you may want to print entitled "Why fruit trees fail to bear." This is a common concern of homeowners. There are many reasons for lack of fruit.

4. Watch the two videos on fruit and vegetable production which are in your county extension office. Each video is about two hours long.
5. Participate in the email discussion on Fruits and Vegetables.
6. Take the Fruits and Vegetables Quiz.
7. Fill out the Fruits and Vegetables Feedback Form.

© 2000, Regents of the University of Minnesota and the Department of Horticultural Science. All rights reserved.



Trees and Shrubs

Objectives

1. Understand basic woody plant classification for identification of woody plant materials.
2. Understand and apply the concepts of plant selection based on site and environmental factors.
3. Understand and apply good planting techniques for trees and shrubs.
4. Understand how branches and trees grow in order to know when and where pruning should be performed.
5. Identify good choices of trees shrubs and vines for Minnesota and to become familiar with reference materials listing good plants for specific sites.

Tasks

1. Read the section on Trees and Shrubs in the Core Course text.
2. Review the Trees and Shrubs slides.
3. Visit the following sites and answer the questions using the online assignment form.

The North Dakota Extension Service has a nice illustrated bulletin on pruning trees and shrubs.

- Shrub rejuvenation is best accomplished by:
 - a. cutting back plants to 2-4" above the ground
 - b. a combination of heading back and thinning
 - c. cutting back to 12" on all main branches
 - d. removing all dead wood

The Purdue FFA page (developed by Rosie Lerner for teaching) has about 75 graphics with brief identification descriptions of ornamental trees and shrubs and flowers. This site is good for picture identification of some common plants.

Ohio State has a Visual Plant Dictionary for over 600 plants. It is complete with pictures and cultural information.

On the University of Minnesota Extension Service website are many useful pubs on trees and shrubs. Three of these are listed below.

- Trees, Shrubs and Vines for Minnesota has a nice list and description of good

selections for our climate.

- A Beginner's Guide To Minnesota Trees is a fun key to identify common trees. Pretend you have a deciduous tree with alternate, simple, lobed leaves to identify.
 - What plant does this key tell you it is ?
 - a. red or silver maple
 - b. basswood
 - c. white or bur oak
 - d. American elm

- At the Sustainable Landscape Site we used in the Home Landscaping Module the Plant Selection information page discussed things to consider when selection landscape plants. Also included here is a large database of several hundred woody and herbaceous plants. This is very helpful if you are searching for a specific plant. Try this plant search looking for shrubs 2-4 feet tall that have winter interest. At the link above, select winter interest from the seasonal interest button and type in 2 feet for the minimum height and 4 feet for the maximum. Click on search and move to the Plant Data tab to view all selections that meet these criteria.
 - How many plants did you come up with ?
 - a. 7
 - b. 14
 - c. 35
 - d. 110

Famous for his work on **Compartmentalization Of Decay In Trees**, Dr. Alex Shigo, is responsible for the current way we think about trees as they respond to wounds. To answer the following question, examine CODIT, as narrated by Dr. Alex Shigo, then answer the following question.

- In the CODIT model, which wall prevents the spread of decay fungi inward or toward the center of the tree?
 - a. Wall 1
 - b. Wall 2
 - c. Wall 3
 - d. Wall 4

Guidelines for Correct Pruning, is a straight and to the point article, developed by the tree doctor himself, Dr. Alex Shigo. Use these guidelines to answer the question below:

- When using the natural target pruning method, described by Shigo, you should:
 - a. make the branch cut outside of the branch collar
 - b. make the branch cut flush with the branch bark ridge
 - c. make the branch cut flush with the trunk
 - d. make the branch cut inside the branch collar

The International Society of Arboriculture hosts an information-rich site called Tree

Care Consumer Information. Go to "Buying High Quality Trees" and answer the following question.

- When buying a high quality tree, which of the following things would you look for?
 - a. several branches at the same position on the trunk
 - b. flush pruning cuts
 - c. basal trunk flare hidden
 - d. basal trunk flare showing

Care For Every Tree (Things every homeowner should know) from the University of Minnesota Extension Service: Forest Resources Extension is an excellent resource to help become familiar with different abiotic factors which cause stress or harm to trees.

4. Participate in the email discussion on Trees and Shrubs.
5. In your county Extension office, look at the CD-ROM "Trees and Shrubs for Minnesota Landscape and Roadsides" compiled by the Minnesota Departments of Natural Resources (DNR) and Transportation (DOT). Look up suitable shrubs and trees for landscaping your own yard. This is a good resource to learn which plants are good for Minnesota.
6. Take the Trees and Shrubs Quiz.
7. Fill out the Trees and Shrubs Feedback Form.

© 2000, Regents of the University of Minnesota and the Department of Horticultural Science. All rights reserved.



Living with Wildlife

Objectives

1. Understand the biology and habitat requirements of urban wildlife.
2. Recognize various types of wildlife and their damage.
3. Become aware of solutions that may help to prevent or reduce wildlife damage.
4. Help others in effectively dealing with animal related problems.

Tasks

1. Read the section on Living with Wildlife in the Core Course text and binder of Extension publications.
2. Review the Living with Wildlife slides.
3. Visit the following sites and submit your answers to the questions using the online assignment form.

Visit this Ohio State Extension Service Factsheet about Controlling Rabbits in the Landscape.

- Which is the BEST way to control rabbits?
 - a. Moth balls and dial soap
 - b. Have-a-heart traps
 - c. Protective netting over top of plants
 - d. Habitat modification and exclusion techniques

The Minnesota DNR is always a good source to turn to for current information regarding wildlife. Take a look at the nuisance animal section of the MN DNR site. Pay special attention to the following links: "Taking a Nuisance Animal" and "Woodchucks", then answer the following questions.

- A nuisance animal normally protected by MN statute can be taken without license or permit if they are doing damage and if a conservation officer is called within 24 hours of the "taking".
 - a. true
 - b. false
- Which of the following methods is NOT legal for controlling woodchucks?
 - a. live trapping
 - b. poisons

- c. shooting or hunting where permissible by law
- d. none of the above

The [Deer Damage and Control](#) site at the University of Connecticut is a good resource for understanding the life history and habits of deer even though this site deals with a different U.S. region. It discusses many different ways to attempt to prevent deer from eating your favorite plants. [Rhode Island's Sustainable Plants](#) site lists plants deer do not like. At the link, scroll down to Appendix 2 then click on the list of Deer Resistant Plants.

- Which is the BEST long term way to control deer?
 - a. Moth balls and dial soap
 - b. Predator manure scattered around plants
 - c. Protective netting over top of plants
 - d. Habitat modification and exclusion techniques

Northwest Gardening, a gardening television series out of Oregon State University has a [Sights and Sounds](#) page that includes a video clip. The video clip is about deer damage. See the instructions for downloading the clip and then rate your experience with this clip in the online assignment form.

Instructions for downloading clip

Your browser should prompt you to download QuickTime (computer video software) if you do not already have it on your computer. Once you have found the sights and sounds page, scroll down and click on video clip #103 so you can see the video. Depending on the speed of your modem, it may take awhile to download. You may want to read part of the core course text book while your waiting.

- Please rate this method of online learning by choosing 1 answer that best describes how you feel. If you choose the last answer (other), please email the TA and mention why you chose this.
 - a. I liked watching the clip
 - b. I liked watching the clip and would like to see more video clips throughout this course.
 - c. I watched, but the tech problems interfered with learning. Couldn't hear it or see it, poor quality.
 - d. I was unable to watch the video, don't know why.
 - e. other

Here is another video clip taken from the University of Wisconsin's Backyard Wildlife. [Rabbit damage](#) is a familiar problem with many homeowners. You may watch this video clip using the same directions as the bird damage video.

The University of Nebraska has published a large three ring binder with wildlife information. Many county Extension offices have this publication and Master Gardeners should become familiar with it. View some of these publications online at the [University of Nebraska Extension Site](#). Many of these publications are great resources and are similar to the ones in your maroon binder.

- Which of the following about skunks is NOT true:
 - a. skunks may leave small holes in the ground where they've fed
 - b. skunks are nocturnal
 - c. skunks feed only on plant material
 - d. skunks can carry rabies

Other useful wildlife resources

The [Extension Forestry](#) pages from North Carolina State University contain a wealth of information on wildlife management. Enter on the glossary page and review these terms. Twenty-five other publications about the most common types of wildlife are listed at the end of the glossary. This site is concerned with increasing wildlife--not limiting it. In the case of hummingbirds and butterflies, most people are happy to see these, but not so for the deer and rabbits!! This is a good resource for further information.

This Minnesota Extension site provides information for planning for wildlife, managing wildlife, and enhancing wildlife. Visit the [Managing Your Land for Wildlife](#) site.

4. If possible, watch the University of Wisconsin Extension Service video "Backyard Wildlife". It is a good resource for additional training for this online class. Contact your county Extension office to borrow the video.
5. Participate in the email discussion this week.
6. Take the [Living with Wildlife Quiz](#).
7. Fill out the [Living with Wildlife Feedback Form](#).

© 2000, Regents of the University of Minnesota and the Department of Horticultural Science. All rights reserved.

