INTRODUCTION

Peer Review of Teaching – Course Portfolio

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Course: Agronomy 650 – Integrated Weed Management
Spring 2007

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PORTFOLIO TABLE OF CONTENTS

Table of Contents ........................................................................................................... 1
Portfolio Purpose ........................................................................................................... 2
Course Design ............................................................................................................... 3
Teaching Methods ......................................................................................................... 5
Assessment .................................................................................................................. 7
Reflection ...................................................................................................................... 11
Appendix Table of Contents ......................................................................................... 14
  Course Materials ....................................................................................................... 15
  First Interaction: Intellectual content ........................................................................ 35
  Second Interaction: Teaching Practices ...................................................................... 36
  Third Interaction: Student learning .......................................................................... 42
Examples of Student Work
PORTFOLIO PURPOSE

During the Spring 2007 semester, I taught Agronomy 650 – Integrated Weed Management as both an on-campus and distance course. This meant two different groups of students that would have very different interactions with the course content and different approaches to reaching the goals and objectives I had outlined for the course. The opportunity to personally review and reflect on this course through the Peer Review of Teaching program was considered as a means to affirm what has been done over the past three offerings of the course (Spring 2004, 2005, and 2006) and to improve the current offering of this course with an outside perspective. Additionally, having a couple sets of eyes from outside the Department of Agronomy to review what is being offered in Agronomy 650 – IWM should prove beneficial.

As a result of the first workshop where we reviewed the proposed course syllabus, a set of goals and objectives were explicitly stated within the syllabus:

**Course Goals and Objectives:**

The overall goal is to increase your confidence and to prepare you to develop and deliver recommendations to producers about managing their weed populations, and to do so by rationalizing decisions about use of pest management tactics for weed control, to protect the environment, to produce safe food, and to be profitable.

Through lecture presentations, assignments, exams, and a group project, you will gain tools for critical thinking, skills for problem solving, guidance in informational searching, experience in evaluating information for reliability, and effective presentation skills. All of this will help you develop and deliver the most appropriate and sound weed control recommendations. At the end of this course, you should be prepared to complete portions of the Kansas Certified Pesticide Applicators Exam relative to weed science and application procedures.

My personal goals and objectives for the course were to provide students both technical content beyond what they have already achieved in a prerequisite course I teach, Agronomy 330 – Weed Science, and to provide opportunities for students to integrate that content through problem solving, critical thinking, and team-work activities. At the end of the course, students
should be confident about making IWM recommendations. Approaches to achieving these goals and objectives were through content-based lectures, assignments that asked students to critically evaluate information in published sources, and a team-work assignment that had students work together to solve problems, develop a weed control recommendation, and present it both in written and oral forms.

I did co-teach this course with Dr. Kassim Al-Khatib. Dr. Al-Khatib was responsible for presenting 8 lectures on chemical weed control, and to develop one exam on this material. Otherwise, I was responsible for all other lectures, assignments, exams, and final submission of grades.

The questions I initially sought to explore through this peer review process were 1) how to add more depth and challenge to the course (since subject matter content was well developed as it had been taught on three previous occasions) and 2) how to add to their weed science knowledge with more integrated ideas (since it is a second weed science course for all students).

As you read through this portfolio, the questions I would like you to address are: 1) did the course seem sufficiently deep in content and challenging in assignments, 2) do the course have assignments and pedagogical strategies to help students reach deeper understanding of the course materials, and 3) are there ways to help the students better integrate course knowledge from information presented throughout the semester, as well as from their entire curriculum?

COURSE DESIGN

Agronomy 650 – Integrated Weed Management is a course designed to meet the needs of students majoring in Agronomy who have chosen the option of Crop Consulting and Production.
These students obtain credit in courses focused on soil science, crop science, and pest management. In the area of pest management, students take two courses in each pest category: weeds (Weed Science-AGRON 330 and Integrated Weed Management-AGRON 650), insects (Economic Entomology-ENTOM 300 or General Entomology-ENTOM 312/313, and Insect Pest Diagnosis-ENTOM 612 or Integrated Pest Management-ENTOM 767), and diseases (Plant Pathology-PLPTH 500 and Crop Diseases-PLPTH 585). Integrated Weed Management is the second weed science course students take. Before IWM was created in 2004, the undergraduate students were to enroll in either Agronomy 720 – Advanced Weed Ecology or Agronomy 724 – Herbicide Interactions, which were courses designed for M.S. and Ph.D. graduate students and modified for undergraduates. It was difficult to meet the needs of both the graduate students in Weed Science and of the undergraduate students interested in consulting and production. Thus, we created the new course “IWM - AGRON 650” specifically for undergraduate students and at this 600-level, possible for MS graduate students to obtain graduate credit. The two graduate-oriented courses were reclassified as AGRON 824 – Advanced Weed Ecology and AGRON 822 – Herbicide Interactions and pedagogical approaches were focused on MS and PhD graduate students interested in Weed Science.

Pedagogical challenges arose initially with the development of the new course, so that it would expand on the initial course of Weed Science but not duplicate content, and to develop appropriate integrative assignments and activities. Another challenge is that this 3-credit course does not have a laboratory component but meets for only two sessions each week for 75 minutes. Several activities could be developed for outdoor hands-on assignments but insufficient time exists to complete them within class time. Limitations include travel time to a field site and completion of activity at the site. Another approach would be to have the students complete these
assignments outside of class but appropriate field sites would need to be identified and permissions granted by the land owner.

Most students in IWM are of junior or senior status and the class usually includes one or two MS graduate students. In Spring 2007, 12 undergraduate students and 1 MS student were enrolled in the on-campus version and 4 undergraduate students, 2 Distance MS students, and one non-traditional student (graduate credit) were enrolled in the Distance version. A total of 20 students participated in Agronomy 650 during the Spring 2007.

The pedagogical advantages of teaching with this on-campus group of students were 1) I already knew the students as I had them in a previous semester of Weed Science (Fall 2005 or Fall 2006), and thus I was aware of the previous knowledge that each student should have possessed; 2) most students were seniors and had previous internship experiences in the field; and 3) they were used to my style of teaching and interacting, with expectations of active engagement in the course. For most undergraduate students, this is a typical sequence of courses (Fall semester - Weed Science, and Spring semester - IWM). The first break in this sequence will be Fall 2007 when I am taking a sabbatical leave and not teaching Weed Science. I will know what materials the students have covered, but presented with a different style.

The pedagogical challenges of teaching this group of on-campus students were 1) too familiar with my teaching style, and 2) misconceptions because of previous internship or on-farm experiences.

As a result of the first workshop where we reviewed the proposed course syllabus, a set of goals and objectives were explicitly stated (see introduction).
TEACHING METHODS

In IWM, I employed teaching methods, course materials, and course activities that were designed to provide active learning and interactive opportunities among the students and between the students and instructor. The course met twice a week for 1 hour and 15 minutes in a formal lecture hall-style classroom. It was not the best environment for small-group discussion activities. Thus, at this time, the teaching methods include lecturing/questioning, one-on-one as well as group discussions, in-class reading and discussions, and problem-solving activities.

Many of these students will become farmers or advisors to farmers. A necessary career skill will thus be the ability to assess the accuracy of information that is provided to them (from advisors, from popular press articles, by county agents and salespeople). Discussion engages the students in the subject matter as well as encourages them to present ideas to fellow students as such communication skills will be expected in their future careers. This activity needs to be developed further so that the discussion is like a debate and will help students assess accuracy of the information as well as help students develop skills of communication and explanation.

The mechanisms used to evaluate students throughout the semester range from subject-matter exams, reading and writing about current issues, to a longer written report and oral presentation completed as a team (descriptions in Appendices). My philosophy on assessment is to have many (several exams, written assignments, discussions) and different (writing, memorizing, presenting orally) mechanisms to evaluate students because each student has different skills and strengths. When I was an undergraduate student, an innovative professor allowed the class to select their methods of assessment (contract), but it was to be a unanimous decision among the students in the course. Unfortunately, it was voted to have one mid-term exam and one final exam in an intensive 10-week course. I did well but it was stressful to consider the impact of doing poorly
on one or the other exam. I would have appreciated other means of assessment, such as short readings, discussions, and I realize that even though written papers take time to prepare, a student gains so much additional knowledge from that assignment. After this experience, I consider numerous and different mechanisms of assessment to be critical for the students to be successful in any course.

Since this is a senior-level course, I expect the students to have the background knowledge of weed science. This course provides more analysis and synthesis of concepts, integration of weed science into broader aspects of crop production. I also expect that they will have strong writing skills, the ability to work as teams, and the abilities to solve problems and think critically. The range of activities and assignments in the class were designed to develop and evaluate these core competencies before students graduate.

ASSESSMENT

The major assignments for the course included subject matter exams, analyzing current issues in Weed Management, and working as a team to develop a Weed Management Recommendation for a given scenario in Kansas that was presented both as a written report and an oral presentation.

Subject Matter Exams

Three subject matter exams were scheduled throughout the semester to evaluate student knowledge of concepts as well as their ability to analyze and synthesis that knowledge. The types of questions on the exams were “short answer,” “compare and contrast among key terms,”
“interpret tables and figures of data,” “solve problems,” and “highlight issues and provide recommendations.” I was responsible for presenting and evaluating the content for the first two exams, while my colleague Dr. Al-Khatib, presented and evaluated content for the final exam.

Student performance on the three exams:

<table>
<thead>
<tr>
<th>Statistical analysis</th>
<th>Exam #1</th>
<th>Exam #2</th>
<th>Final Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point total</td>
<td>80</td>
<td>70</td>
<td>100 (+7 bonus)</td>
</tr>
<tr>
<td>Range of scores</td>
<td>57.5-77.0</td>
<td>37-64</td>
<td>43-99</td>
</tr>
<tr>
<td>Mean (stdev)</td>
<td>65.88 (6.45)</td>
<td>55 (6.36)</td>
<td>71.15 (14.04)</td>
</tr>
<tr>
<td>Median score</td>
<td>63.5</td>
<td>55</td>
<td>78.6</td>
</tr>
</tbody>
</table>

In general, student performance on the subject matter exams declined over the semester. Dr. Al-Khatib and I have responsibilities for teaching very different subject matter areas and our approaches to presenting this content to the students varies. One reason for declining scores is uncertainty in how Dr. Al-Khatib develops exam questions and thus, students not preparing sufficiently for the final exam. Another reason is that the first exam is more review of subject matter, while the latter two exams present new information. A blank copy of Exam #1 is included in the Appendix. Responses to some key questions demonstrate representative examples of high (77/80), medium (65/80), and low (57.5/80) performance on portions of this exam.

Current Issues in Weed Management

During the semester, each student was to locate three articles (popular press or online stories) about an issue in weed management and provide a 1-paragraph summary, a list of questions, and an answer to one of those questions based on additional research (graded assignment). On a given due date, small groups were formed in-class and students were to share their issue and questions amongst each other. Then as a group, they were to select one of those issues to
highlight with the rest of the class (not a graded activity). Additionally, three current issues and related questions were posted on the message board feature of K-State Online (MB A-C). Each student was to read the article/issue, develop answers to the questions, and post them to the message board by a given due date (graded assignment).

Student performance on three current issue and three message board assignments (n=13 on-campus students):

<table>
<thead>
<tr>
<th>Statistical analysis</th>
<th>Issue 1</th>
<th>Issue 2</th>
<th>Issue 3</th>
<th>MB A</th>
<th>MB B</th>
<th>MB C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point total</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Range</td>
<td>14-20</td>
<td>11-21</td>
<td>11-20</td>
<td>10-15</td>
<td>11-15</td>
<td>4.5-15</td>
</tr>
<tr>
<td>Mean</td>
<td>17.08</td>
<td>17.73</td>
<td>16.31</td>
<td>13.69</td>
<td>14.31</td>
<td>11.65</td>
</tr>
<tr>
<td>Std dev</td>
<td>2.12</td>
<td>2.45</td>
<td>2.55</td>
<td>1.54</td>
<td>1.2</td>
<td>2.96</td>
</tr>
<tr>
<td>Median</td>
<td>17</td>
<td>18</td>
<td>17</td>
<td>14</td>
<td>15</td>
<td>11</td>
</tr>
</tbody>
</table>

Overall student performance was average for first Issue or MB A, and then increased for second issue or MB B, followed by poor performance on third issue or MB C. By the end of the semester, it was expected that students would understand the assignment and easily meet expectations, but this was not the case.

With respect to their individual selection of current issues and questioning the information, student performance did not improve over the course of the semester and they could not develop critical questions of the information presented. It was expected that they would have more content-specific knowledge, and thus be able to evaluate what was written in popular press or online stories and question the validity, accuracy, or additional details required. Examples of high, medium, and poor work related to Current Issue #2 and Current Issue #3 are included in the appendix. Quality differences were highly based on number, type, and depth of critical questions posed in regards to the particular article selected. These questions developed by the student indicated the level of understanding of the article and ability to place it into context of other
content already reviewed (or to be covered in class). In the future, it will probably be helpful to demonstrate how to complete this current issues assignment by walking through an example. Perhaps have the entire class read a given current issue, develop some questions, and come to class prepared to identify and select critical questions. Also, follow through with students conducting research to locate answers for those critical questions.

With respect to the message board discussions, the on-campus group of students did not invest time into preparing answers and doing research. The performance of the distance group of students was better on these message board assignments as they prepared extensive and complete answers.

Reading about Critical Period of Weed Control

One informal assignment included two general articles on a concept, “critical period of weed control” together with a series of questions. The students were asked to read the articles, type up answers to the questions, use those worksheets for in-class discussion and to add additional information, and turn them in at the end of the class session. I did not formally grade the assignment, but it provided great feedback on what the students were able to understand from the readings, how well they were able to interpret data from a table, and ability to analyze and synthesis information. I expect to develop more of these assignments in order to better engage the class in subject matter, provide for more active in-class discussions, and highlight areas that need improvement (e.g., interpretation of data and making graphs).

Team Work to Develop Integrated Weed Management Recommendations
The final assignment was a group-based activity where teams of 2 to 3 students were to evaluate a weed management scenario from a given location in Kansas, to develop a one-year and multi-year weed management recommendation for a given producer, and to present this in both written and oral formats. Again, this is exactly the kind of activity that these students will be expected to participate in during their careers: team work, following directions, problem solving, critical thinking, and writing and orally presenting a recommendation for a producer to follow.

Each written and oral assignment had a grading rubric that was provided to the students at the same time that the assignment was given (see Appendices). I am certain that students do not appreciate how a rubric can help them improve their work, but it was reviewed at the same time as reviewing the assignment specifications. A rubric allows me to be more objective in my evaluation of their assignments, which students are always desiring.

Group performance on developing an IWM recommendation (n=5 groups, n=13 students):

<table>
<thead>
<tr>
<th>Statistical analysis</th>
<th>Written Report</th>
<th>Oral Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point total</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Range</td>
<td>64-89</td>
<td>71.4-94.3</td>
</tr>
<tr>
<td>Mean</td>
<td>76</td>
<td>83.95</td>
</tr>
<tr>
<td>Std dev</td>
<td>8.8</td>
<td>8.0</td>
</tr>
<tr>
<td>Median</td>
<td>75</td>
<td>84.6</td>
</tr>
</tbody>
</table>

The students were given the assignment, grading rubric, and placed into groups based on individual interest and selection of a given scenario (crop choice and location in KS) early in the semester. During that class session, the groups started to work together on the given scenario by locating their particular field site in a county-level soil survey book, evaluating the issues, and dividing up the tasks. During subsequent class periods, I asked the student groups, in general terms, the progress on their integrated weed management recommendation over the course of the semester. They turned in a rough draft of the written project in mid-April and I provided general
comments on the draft. Due dates for the final written report and oral presentation coincided during the first week of May.

In general, performances for both the written and oral weed management recommendations were weaker than expected. Students did not completely evaluate the scenario provided to them, did not complete the economic analysis of the scenario, and glossed over the environmental issues that the producer had expressed. In the written portion, references were rarely used and if they were included were cited incorrectly. Students did not provide specific application rates of herbicide products if recommended, and on occasion, provided many options, but not a specific choice or recommendation for the given producer. Individual student groups were not consistent in their performance on the written and oral reports, such that a group would do very well on written but poorly on oral presentation. This clearly showed the strengths of students in different skills, whether written or oral.

REFLECTION

Participation in the K-State Peer Review of Teaching Program during the 2006-2007 academic year has helped me to appreciate and articulate my pedagogical approaches (art and science of teaching) in Integrated Weed Management – Agronomy 650. By observing activities and student interactions in a very different course (Environmental History of Latin America – HIST 598), I am encouraged to increase the expectation levels of my own students, rather than feeling like they are not capable of completing certain tasks and activities. For example, I should be able to expect my students to read outside of class and thus, be prepared for discussions in class. I should be able to develop out-of-class activities for students to conduct independently or
as a group and learn on their own. I will expect my students to be more directly involved in determining the content that they need to learn.

Effective practices and mechanisms used during the Spring 2007 semester include 1) using diverse methods of assessing student learning, and more importantly, reflecting on why student performance ranged widely with ideas on how to encourage better performance; 2) using group-discussion periods tied to individual assignments, so that students appreciate their contribution to class learning; and 3) having students evaluate each other (peer review of oral presentations) to appreciate and encourage their performance in a given assignment.

Ineffective practices and mechanisms used during the Spring 2007 semester include 1) too much lecturing without more student preparation/reading ahead of time on a given topic, such as with the critical period of weed control reading assignment; and 2) dominant use of subject matter exams to evaluate content knowledge.

My peer review partner, through her course and teaching strategies, indirectly influenced my thinking of student preparation ahead of presenting a given topic. In a history-based course, substantial reading is required to be prepared for questioning and discussion, and this could easily be included in a science-based course. A trend in my courses and others in Agronomy has been for little reading by students ahead of class. The assignments were designed for them to search of relevant articles and to prepare their written report, but these were poorly done. Their need to do more reading is critical and this will need to be modified in Agronomy 650 – Integrated Weed Management. Additionally, our interactions provided direct evidence of the need for partnering across disciplines for broad training of our students. Many agronomic elements were included in her readings that the students did not understand, and I am certain that
many historical elements of the activities in Kansas and around the world would be beneficial for the agronomy students.

A dramatic idea for this course is to transition it into an “inquiry-based learning” course, where it is shifted from teacher-centered to student-centered. This would require very few if any lectures and lots of teamwork opportunities, questioning, discussion, and field trips. I think that this is the approach for the future of this course.

Another perspective is to develop a new course that brings together aspects of Environmental History and Agronomy Principles in tropical crop production, based on the interactions we’ve had this past semester.
APPENDICES

Course Materials

Course Syllabus .............................................................................................................. 15
Course Schedule .............................................................................................................. 20
Description of Current Issue Assignment and Rubric .................................................. 22
Description of Critical Period of Weed Control Assignment and Rubric .......... 24
First Lecture Exam (80 points) Spring 2007 .............................................................. 26
Description of IWM Recommendations Assignment ............................................. 29
Written Recommendation Grading Rubric ............................................................... 33
Oral Recommendation Grading Rubric ................................................................. 34

First Interaction: Intellectual Content

Reflective Memo IWM Syllabus .................................................................................. 35

Second Interaction: Teaching Practices

Reflective Memo #1 – January 30/February 1, 2007 ................................................. 36
Reflective Memo #2 – March 6/8, 2007 ..................................................................... 38
Reflective Memo #3 – April 12 / May 1, 2007 .......................................................... 40

Third Interaction: Student Learning

Reflective Memo .......................................................................................................... 42

Examples of Student Work

Current Issues #2 and #3 examples ........................................................................... 
Written Recommendation Report examples ...........................................................
Integrated Weed Management – Spring 2007
Agronomy 650
Syllabus

Lecture: Tuesday & Thursday, 1014 TH
1:05 – 2:20 p.m.

Instructors: Dr. J. Anita Dille          Dr. Kassim Al-Khatib
Office: 3701 TH                          3108 TH
Office phone: 785-532-7240                 785-532-5155
Cell phone: 785-565-2346                   
E-mail: dieleman@ksu.edu                  khatib@ksu.edu
Office Hours: Open door                   Open door

Prerequisite: Agronomy 330 – Weed Science or similar course as an introduction to Weed Science

Brief Overview of Course:
We will explore the development of weed management recommendations based on assessment of weed problems, understanding crop-weed associations and interactions with the environment, management practices, and economics, and integrating weed control tactics such as chemical, biological, cultural, and mechanical practices into a recommendation.

Course Goals and Objectives:
The overall goal is to increase your confidence and to prepare you to develop and deliver recommendations to producers about managing their weed populations, and to do so by rationalizing decisions about use of pest management tactics for weed control, to protect the environment, to produce safe food, and to be profitable.

Through lecture presentations, assignments, exams, and a group project, you will gain practices in critical thinking, problem-solving skills, where to search for information, how to evaluate the reliability of that information, and present it effectively in order to develop and deliver the most appropriate and sound weed control recommendations.

At the end of this course, you should be prepared to complete portions of the Kansas Certified Pesticide Applicators Exam relative to weed science and application procedures.

Course Materials:
Most course materials will be found on our course web site at K-State Online: http://public.online.ksu.edu/. This resource will be our home base for information re: updates on lectures and lecture materials, scheduled chat rooms and message board assignments, and grades. We will also use e-mail frequently for sharing information. K-State Online has your default e-mail address as: name@ksu.edu; please ensure that messages are forwarded from this account to the e-mail address you use regularly or change the default e-mail address online.

Resources: (No textbook is required, but several are available on reserve in the Agronomy Library TH 3002, or for purchase at a bookstore)


**Most Probable Grading System:**

<table>
<thead>
<tr>
<th></th>
<th>Possible points</th>
<th>Your points</th>
<th>Grade %</th>
<th>Your score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exams:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First exam (lectures #1-10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second exam (lectures #12-19)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comprehensive Final</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Weed Control Recommendation Reports</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Other assignments (issues, message board, etc)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

**Accommodations:**

If you have any condition, such as a physical or learning disability, that will make it difficult for you to carry out your work as outlined here or that will require academic accommodations, please contact Dr. Dille in the first week of class to make arrangements.

**Honor Code:**

Kansas State University – The Undergraduate Honor System - http://www.ksu.edu/honor/

It is expected that all academic work completed in this class will be done individually by you unless otherwise indicated. Plagiarism and cheating are serious offenses and may be punished by failure on the exam, paper, or project; failure in the course; and/or expulsion from the University. K-State operates under an Undergraduate Honor System in which students have the responsibility for the effectiveness of the Honor Code and a reason to help protect the integrity of our university. More information on the Honor System is available at www.ksu.edu/honor.

On all assignments, examinations, or other course work undertaken by students, the following Honor Pledge is implied, whether or not it is stated:

"On my honor, as a student, I have neither given nor received unauthorized aid on this academic work."
General Description of Assignments:

More details will be provided prior to each specific assignment or exam. Below are general descriptions and expectations.

- **Current Issues in Weed Management.**

Through collecting newspaper, magazine, and web-based articles and advertisements, with small group discussions and chat rooms, and by participating in Message Board discussions, you will be able to identify, discuss, and develop expertise on current issues in weed management for Kansas and Midwestern US agriculture.

During the semester, each student must locate a total of three (3) different articles and/or advertisements on some aspect of weed management. You will need to submit at least one article by each deadline date (they can be submitted earlier):

- **Issue #1 due on Jan. 30**
- **Issue #2 due on Feb. 27**
- **Issue #3 due on April 3**

Specifics:

**A. Article:** Provide a copy of the magazine, newspaper or web-based article and/or a web-site reference. It must have at least ½ page of text and include web site references and/or literature reference on where the article was obtained, dates written, authors, etc.

**B. Summary:** Provide a clear, concise summary of this article, in your own words, in 5-6 sentences (one paragraph). In your summary, clearly identify the current issue that is being presented and why the article was prepared.

**C. Questions for discussion of issues:** As you read through the article, indicate questions that you would ask for clarification on what was presented, new terminology, or what other information you would need to fully understand what was presented. What does the article assume you know and what alternative perspective could be presented?

**D. Answer:** Provide an answer, in detail, to one of your questions so that you are prepared for future discussion.

**E. Errors?** If you identify a mistake, error, or some type of misinformation that is included in the article, you will receive bonus points!

**Submission procedures:** By the deadline date, submit an electronic and/or hard copy of the article, your summary, questions, answer and any errors, to Dr. Dille via e-mail (Dieleman@ksu.edu) or as a paper copy in class.

- **Discussion of Current Issues in Weed Management.**

On the due date for submitting current issue, a small group (in-class; 20 minutes) or chat room (online; 3:00 to 4:30 pm) discussion will take place at the beginning of class. In the in-class groups, 1) each group member shares their current issue within the group, taking a total of eight to ten minutes; 2) use another three to four minutes to pick the most intriguing issue; and 3) select someone other than the person whose issue was
picked to share that example with the class. Then one person from each group will share that issue with the entire class.

A chat room discussion is planned from 3:00 to 4:30 pm via K-State online. All distance students are expected to upload their current issue article and summary by 11:30 a.m. on the due date. Thus, they can be posted up on K-State online for review before the discussion period. Dr. Dille will initiate the discussion and be prepared to ask and answer questions.

- **Message Board discussions of Current Issues**

  On three (3) occasions during the semester, a Current Issue and related questions will be posted (e.g. **MB: Issue A posted**) on the Message Board on K-State Online. The issue will be posted sometime on Thursday afternoon. Responses will be due by the following Wednesday at midnight. Each student will be required to participate in a discussion of each posted issue.

  To gain credit (5 points / discussion), each student will provide an answer to the posted questions, and should include additional questions, comments, related articles, etc. Students will be evaluated on quality of response to question(s) posted and participation in the developing discussion. You must participate in discussion at least once, and can follow up with other comments or questions to points made by other students.

- **Weed Management Decision Making Tools**

  A series of homework assignments will be developed to use different decision making tools, such as WeedSOFT Online, WeedCAST, Kansas Guide to Weed Control, etc. during the first part of the semester.

- **Group written and oral projects for on-campus students**

  With given data on a particular field and cropping system, groups of 3-4 students will write up and orally present a one- and multi-year integrated weed management recommendation based on economics and environmental constraints. Each team will be given general information on a particular field and cropping system somewhere in Kansas or central USA. Using that particular scenario, each team will gather more data and information in order to develop an integrated weed management recommendation for this coming growing season, as well as plan out a complete 3-year recommendation.

  **Written Group Project:**

  One written project per group will be handed in. Important sections to be included are 1) general introduction and description of your particular field, cropping system, and location; 2) key issues that arose as you researched this particular scenario; 3) an outline of all available control tactics describing potential advantages and disadvantages; 4) the potential damage and
economic costs associated with the control tactics; 5) the potential interactions and environmental constraints for available control tactics; and 6) a current 1-year recommendation and following complete 3-year recommendation. Include references to any literature consulted.

**Oral Group Presentation:**
The oral presentation should be 20 to 30 minutes in length and can be in the style of a formal PowerPoint presentation, role-playing, or as a debate. Be creative, but each member of the group needs to participate. We will develop a method to account for each member’s participation.

- **Two Lecture Exams and One Final Comprehensive Exam**

**Distance Students:**
- **Written project**

Each student will prepare a written project based on data given on a particular field and cropping system. Each student will be asked to develop a one- and multi-year integrated weed management recommendation based on economics and environmental constraints.

Important sections to be included in the written report are 1) general introduction and description of your particular field, cropping system, and location; 2) key issues that arose as you researched this particular scenario; 3) an outline of all available control tactics describing potential advantages and disadvantages; 4) the potential damage and economic costs associated with the control tactics; 5) the potential interactions and environmental constraints for available control tactics; and 6) a current 1-year recommendation and following complete 3-year recommendation. Include references to any literature consulted.

More details will be shared during the semester.
<table>
<thead>
<tr>
<th>#</th>
<th>Date</th>
<th>Day</th>
<th>Lead</th>
<th>Lecture Topic</th>
<th>Assignments and Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jan. 11</td>
<td>Th</td>
<td>Dille</td>
<td>Introduction; Orientation; Syllabus</td>
<td>Message Board (MB): What do I want to Learn in IWM?</td>
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<td>2</td>
<td>Jan. 16</td>
<td>T</td>
<td>Dille</td>
<td>What is IWM or IPM?</td>
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<td>3</td>
<td>Jan. 18</td>
<td>Th</td>
<td>Dille</td>
<td>Biology and Population Dynamics</td>
<td>MB: Issue A posted (due #5)</td>
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<td>Dille</td>
<td>Decision Making Tools</td>
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<td>5</td>
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<td>Th</td>
<td>Dille</td>
<td>Field Scouting and Sampling</td>
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<tr>
<td>6</td>
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<td>Dille</td>
<td>Current issue #1 discussion</td>
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<td>Chat Room – 3:00 to 4:30 pm</td>
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<td>7</td>
<td>Feb. 1</td>
<td>Th</td>
<td>Dille</td>
<td>Economic Thresholds</td>
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<tr>
<td>8</td>
<td>Feb. 6</td>
<td>T</td>
<td>Guest</td>
<td>Guest – TBA</td>
<td>(WSSA)</td>
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<tr>
<td>9</td>
<td>Feb. 8</td>
<td>Th</td>
<td>Guest</td>
<td>Guest – TBA</td>
<td>(WSSA)</td>
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<tr>
<td>10</td>
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<td>Critical Period of Weed Control</td>
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<td>11</td>
<td>Feb. 15</td>
<td>Th</td>
<td>Dille</td>
<td>1st Exam (#1-10)</td>
<td>1st Exam (#1-10)</td>
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<td>MB: Issue B posted (due #13)</td>
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<td>12</td>
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<td>Dille</td>
<td>Discussion – Group Projects</td>
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<td>13</td>
<td>Feb. 22</td>
<td>Th</td>
<td>Dille</td>
<td>Weed Control Tactics</td>
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<td>14</td>
<td>Feb. 27</td>
<td>T</td>
<td>Dille</td>
<td>Current issue #2 discussion</td>
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<td>Weed Control Tactics</td>
<td>Chat Room – 3:00 to 4:30 pm</td>
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<tr>
<td>15</td>
<td>Mar. 1</td>
<td>Th</td>
<td>Dille</td>
<td>Weed Control Tactics</td>
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<td>16</td>
<td>Mar. 6</td>
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<td>Weed Control Tactics</td>
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<td>17</td>
<td>Mar. 8</td>
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<td>Dille</td>
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<td>18</td>
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<td>Guest</td>
<td>Guest – TBA</td>
<td>(WSWS)</td>
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<td>19</td>
<td>Mar. 15</td>
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<td>Guest</td>
<td>Guest – TBA</td>
<td>(WSWS)</td>
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<td>SPRING BREAK</td>
<td>MB: Issue C posted (due #21)</td>
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<td>Dille</td>
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<td>Lead</td>
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<td>Assignments and Activities</td>
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<td>21</td>
<td>Mar. 29</td>
<td>Th</td>
<td>Al-Khatib</td>
<td>Herbicides – Legal Aspects and Classification</td>
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<tr>
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<td>April 3</td>
<td>T</td>
<td>Al-Khatib</td>
<td>Herbicide Physiology</td>
<td>Current Issue #3 Due</td>
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<td>Chat Room – 3:00 to 4:30 pm</td>
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<tr>
<td>23</td>
<td>April 5</td>
<td>Th</td>
<td>Al-Khatib</td>
<td>Herbicide Physiology</td>
<td>Due: Written Project Draft</td>
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<td>April 10</td>
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<td>Al-Khatib</td>
<td>Herbicide Selectivity</td>
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<td>April 12</td>
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<td>Al-Khatib</td>
<td>Spray Adjuvants</td>
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<td>26</td>
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<td>Al-Khatib</td>
<td>Interactions and Optimizing Herbicide Activity</td>
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<td>Th</td>
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<td>T</td>
<td>Al-Khatib</td>
<td>Herbicide Drift</td>
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<td>29</td>
<td>April 26</td>
<td>Th</td>
<td>Dille</td>
<td>Presentations</td>
<td>Group Oral Presentations</td>
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<tr>
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<td>May 1</td>
<td>T</td>
<td>Dille</td>
<td>Presentations</td>
<td>Group Oral Presentations</td>
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<td>31</td>
<td>May 3</td>
<td>Th</td>
<td>Dille</td>
<td>Presentations</td>
<td>Group Oral Presentations Final Written Project Due</td>
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Friday, May 11  2:00 – 3:50 pm in TH 1014  Final Comprehensive Exam
Assignmnet:  Current Issues in Weed Management

Student Learning Outcome: Through collecting newspaper, magazine, and web-based articles and advertisements, be able to identify, discuss, and develop expertise on current issues in weed management for Kansas and Midwestern US agriculture.

Specific Objective: During the semester, locate a total of three (3) different articles and/or advertisements on some aspect of weed management, summarize the issue in 5-6 sentences (one paragraph), identify the issue, and develop a list of questions for clarification and/or needs for additional information.

Deadline dates: You will need to submit at least one article by each of the following deadline dates (they can all be submitted earlier):

Issue #1: Tuesday, January 30
Issue #2: Tuesday, February 27
Issue #3: Tuesday, April 3

Specifics:

A. Article: Provide a copy of the magazine, newspaper or web-based article and/or a web-site reference. It must have at least ½ page of text and include web site references and/or literature reference on where the article was obtained, dates written, authors, etc.

B. Summary: Provide a clear, concise summary of this article, in your own words, in 5-6 sentences (one paragraph). In your summary, clearly identify the current issue that is being presented and why the article was prepared.

C. Questions for discussion of issues: As you read through the article, indicate questions that you would ask for clarification on what was presented, new terminology, or what other information you would need to fully understand what was presented. What does the article assume you know and what alternative perspective could be presented?

D. Answer: Provide an answer, in detail, to one of your questions so that you are prepared for future discussion. Provide the reference for source of information.

E. Errors? If you identify a mistake, error, or some type of misinformation that is included in the article, you will receive bonus points!

Submission procedures: By the deadline date, submit an electronic and/or hard copy of the article, your summary, questions, answer and any errors, to Dr. Dille via e-mail (Dieleman@ksu.edu) or as a paper copy in class.

- Discussion of Current Issues in Weed Management.
  
  On the due date for submitting the current issue, a small group (in-class; 20 minutes) or chat room (online; 3:00 to 4:30 pm) discussion will take place at the
beginning of class. In the in-class groups, 1) each group member shares their current issue within the group, taking a total of eight to ten minutes; 2) use another three to four minutes to pick the most intriguing issue; and 3) select someone other than the person whose issue was picked to share that example with the class. Then one person from each group will share that issue with the entire class.

A chat room discussion is planned from 3:00 to 4:30 pm via K-State online. All distance students are expected to upload their current issue article and summary by 11:30 a.m. on the due date. Thus, they can be posted up on K-State online for review before the discussion period. Dr. Dille will initiate the discussion and be prepared to ask and answer questions.

If you find additional interesting articles, or something that supports or refutes a previously discussed issue, please submit as well!!

Agronomy 650 – Integrated Weed Management, Spring 2007
Grading of Current Issue (possible 20 points): Name: ___________________________

<table>
<thead>
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<th>Evaluation criteria</th>
<th>Excellent (5)</th>
<th>Satisfactory (3)</th>
<th>Unacceptable (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article</td>
<td>Attached with authors &amp; source</td>
<td>Attached</td>
<td>Not attached</td>
</tr>
<tr>
<td>Summary</td>
<td>Clearly stated issue, 5-6 sentences, correct grammar and spelling</td>
<td>Issue mentioned, 3-5 statements, 2-5 errors in grammar and spelling</td>
<td>Issue not defined, &lt;3 sentences, incomplete</td>
</tr>
<tr>
<td>Questions posed</td>
<td>Clearly thought out questions on the issue and critical analysis of article</td>
<td>Good range of questions but not very critical</td>
<td>Questions are not clearly stated, no critical analysis of article</td>
</tr>
<tr>
<td>Answer</td>
<td>Clear response to question posed, with indication of research conducted</td>
<td>Some information presented in response to question</td>
<td>No answer supplied, or no research conducted to determine answer</td>
</tr>
<tr>
<td>Errors?</td>
<td>Bonus!</td>
<td></td>
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</table>
Agronomy 650 – Integrated Weed Management
No classes on Tuesday, February 6 or February 8, 2007

Since Drs. Dille and Al-Khatib will be at the annual conference of the Weed Science Society of America during the week of February 5-9, 2007, there will be no formal classroom time on Tuesday, Feb. 6 nor Feb. 8, 2007

Introduction to Critical Period of Weed Control

In preparation for class on Tuesday, Feb. 13, please read the referenced two articles (attached and links on K-State Online) and complete the questions below. Each student will have a typed response for each question (or attach graph, reference, etc) to be used during lecture for supplemental notes, and turned in at the end of lecture. The topic for presentation on Tuesday is “Critical Period of Weed Control”.


Questions:
1. What is a definition of the critical period of weed control (CPWC)?

2. What is the value of knowing the CPWC, or in other words, why should we determine the CPWC or its components?

3. What are the steps in an experiment to determine the CPWC? (may need to look up references quoted in the specific articles)

4. How does CPWC change with respect to crop (corn, soybean, double-crop soybean, others?)

5. How does CPWC change with respect to fertility program?

6. How does CPWC change with respect to row spacing or other crop production practices?

7. Why is the CPWC relevant to glyphosate-resistant soybean production systems?

8. Select one of the tables in either article (Article 1, select from tables 1 or 2; Article 2, select from tables 4, 5, or 6) and translate the information in the form of a graph, fully labeled.

9. Locate a research paper or summary about CPWC for a completely different crop (not corn or soybean). Describe the crop production system and the CPWC for that crop.
**Agronomy 650 – Integrated Weed Management**  
**Critical Period of Weed Control**

Rubric for assignment:

<table>
<thead>
<tr>
<th>Question</th>
<th>Good to excellent</th>
<th>Average</th>
<th>Poor</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>1. What is definition of critical period of weed control?</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2. What is value of knowing CPWC?</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>3. What are experimental steps to determine CPWC?</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>4. How does CPWC change with crop?</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>5. How does CPWC change with fertility program?</td>
<td>2</td>
<td>1</td>
<td>0</td>
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<tr>
<td>6. How does CPWC change with row spacing or production practices?</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>7. Why is CPWC relevant to glyphosate-resistant soybean production?</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>8. Translate table into graph</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9. Locate research paper and summarize crop production system and CPWC</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
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<tr>
<td>Total</td>
<td>20</td>
<td>19</td>
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</table>
First Lecture Exam (80 points)

1. (5 points) Pest identification is an important first step towards making weed management decisions. Using a specific example, give two (2) reasons why this is an important first step.

2. (5 points) “Sustainable” production systems may be easier to achieve than true “organic” production systems, and it may be a better concept to sell to both producers and consumers.
   a. With that in mind, what is the goal of IWM and what is your definition of IWM?
   b. USDA categorized IPM practices into four categories with the acronym: PAMS. Select two of these categories and describe two (2) specific practices would be classified as part of an IWM system (and thus sustainable).

3. (10 points) Winter wheat is an important crop in Kansas and throughout the Great Plains. Many growers wait until spring to make any weed control decisions because the crop may or may not have survived the winter. You have been asked to scout a wheat field in early March to assess need for weed management. You are on step 2 – population determination – of the decision staircase.
   Describe in detail:
   a. how you will scout / walk the field,  
   b. what you will be looking for and sampling, and  
   c. key information you would record on a “scouting” form in order to make appropriate weed management recommendations.

4. (10 points) Describe and contrast the three (3) spatial distribution patterns of weed populations that could be found in a field: regular, random and patchy. Include in your description under what conditions such a pattern might occur or what weed species might show that type of pattern.

5. (8 points) Describe two (2) environmental factors that are required for successful seed germination and emergence. Describe how those two factors can be used to model or predict emergence of weeds? Why would knowing when weeds emerge be helpful in making weed management decisions?
6. (6 points) Draw the typical yield loss response to increasing weed density when weeds emerge with the crop and also the yield loss response to increasing density of late emerging weeds on the graph below. Fully label the axes and response lines (units, etc).

![Graph](https://example.com/graph.png)

% yield loss

Weed density

7. (8 points) The yield loss response to weed density graph can be used to determine an economic threshold.

   a. Define an economic threshold for weeds.

   b. Based on your response lines drawn in Question 6, what is the economic threshold at 20% yield loss for each group of weeds?

   c. What are four “costs” that should be included in determining your economic threshold?

8. (4 points) The decision to manage weeds should be economically justified. In typical cropping systems, we usually measure grain yield loss. List other measures could be considered. What do you think should trigger the decision to manage weeds in a) fresh market vegetable crop like lettuce or tomato, and b) grazing rangeland?

9. (4 points) If the critical period of weed control in corn is V3 to V7, explain in detail what that means?
10. (10 points) Draw and label (with words, values, and units) a simple population dynamics diagram for the lifecycle of an annual weed species such as giant ragweed. Fill in your diagram using the data presented below (read carefully) and fill in diagram with answers to the additional questions below.

a. Let us assume that 1250 seed / giant ragweed plant were produced last fall. The density of plants in the fall was 0.2 plants / m².
b. Over winter, 65% of the seed were lost to predators and freezing damage.
c. Before planting corn, we scouted the field in early April and observed, on average 60 giant ragweed seedlings / 10 m² (equivalent to 100 feet of row).
d. In late April, after a burndown application and corn planting, only 8 giant ragweed seedlings / 10 m² survived.
e. With no further weed control, 4 giant ragweed seedlings / 10 m² survived to begin flowering and producing seed in August.

11. (10 points) Additional questions based on data presented in Question 10:

A) How many viable new seed will be present in the soil prior to April and corn planting? __________________________

B) What is the rate of germination and emergence? _______________________

C) What is the rate of giant ragweed seedling survival through the burndown application and corn planting? ________________________

D) How many new giant ragweed seed will be produced at harvest? _________________

E) Using the table below and information from question 10d, what is the predicted amount of corn yield loss with giant ragweed seedling population at the end of April? __________________________

![Competition In Field Corn Table]

<table>
<thead>
<tr>
<th>Percent Corn Yield Reduction</th>
<th>Cocklebur</th>
<th>Valerian</th>
<th>Smartweed</th>
<th>Pigweed</th>
<th>Shattercane</th>
<th>Giant Foxtail</th>
<th>Nutsedge</th>
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</thead>
<tbody>
<tr>
<td>1%</td>
<td>4</td>
<td>6</td>
<td>10</td>
<td>12</td>
<td>6</td>
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<td>800+</td>
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<td>800+</td>
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<td>40</td>
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<td>80</td>
<td>150</td>
<td>100</td>
<td>200</td>
<td>800+</td>
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Agronomy 650- Integrated Weed Management  
Spring 2007  

Assignment: Developing an IWM Recommendation

Student Learning Outcome: Given data on a particular field and cropping system, write up and orally present a one-year and multi-year integrated weed management recommendation for that particular situation based on economics and environmental constraints.

Specific Objective: Each team will be given general hypothetical information on a particular field and cropping system. Using that particular scenario, gather more data and information in order to develop an IWM recommendation for this coming growing season, as well as plan out a complete 3-year recommendation.

Proposed Deadline Dates:

Draft of Written Project: Thursday, April 15  
Oral Presentations: April 26, May 1, and May 3  
Final Written Project: Thursday, May 3

Specifications:  
Written Group Project: One written project per group will be handed in.  
Important sections to be included are:  
1) General introduction and description of your particular field, cropping system, and location;  
2) Key issues that arose as you researched this particular hypothetical scenario (watersheds, soil types, urban development, etc);  
3) An outline of all available control tactics describing potential advantages and disadvantages;  
4) The potential damage and economic costs associated with the control tactics (if you use WeedSOFT, include printouts);  
5) The potential interactions and environmental constraints for available control tactics; and  
6) A current 1-year recommendation and a subsequent complete 3-year recommendation.

Include references to any literature consulted. The written project should follow ideas presented in the Decision Staircase example.

Oral Group Presentation:  
The oral presentation should be 20 to 30 minutes in length and can be in the style of a formal PowerPoint presentation, role-playing, or as a debate. Be creative, but each member of the group needs to participate.

Approach: An Advisory Team  
You are an advisory team and you may suggest alternatives within the scenario chosen. You can present arguments for and against a particular suggestion. Seek out information and advice from area agronomists, local extension agents, crop consultants, and others you know in the area. Dr. Al-Khatib and I are also local advisors on the different scenarios. Do not hesitate to visit with us. Make the scenario as real and relevant as possible.
**Scenario A: Winter Wheat field in North East Kansas**

**Location:** Pottawatomie County, SE ¼ of Section 20, T. 7 S., R. 8 E.

**Planned rotation:** winter wheat – grain sorghum or corn – soybean (no doublecropping)

**No-tillage crop production**

**Sensitive watersheds:** Little Blue River and Tuttlecreek Reservoir

**General Description and Issues:** Began to establish rotation with a no-tillage system in the two years. Previously, continuous wheat has developed a *Bromus* spp. problem. With the switch to no-tillage, potential issues are prairie cupgrass and windmillgrass in fallow wheat. There is a strong likelihood of ALS-resistant common waterhemp and Palmer amaranth populations in the area. Other weed problems include shattercane, common cocklebur, and patches of field bindweed.

**Team Members:**

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**Suggested K-State Resources:**
MF2641 – Managing no-till wheat following a summer crop in Eastern Kansas.
MF2085 – Kansas winter annual grass weeds in winter wheat.
MF2339 – Weed control in dryland cropping systems.

**Scenario B: Soybean in Southeast Kansas**

**Location:** Crawford County, west of McCune: SE ¼ of section 7, T. 31 S., R. 22 E.

**Planned rotation:** soybean – corn – soybean

**Conventional tillage crop production:** Soybean planted early to mid-June with late Group 4 or Group 5 soybean; harvested in October. Corn planted mid-April.

**General Description and Issues:** Grower is concerned over predominance of Roundup Ready soybean production and wants explore options with regards to conventional, food- or industrial-grade soybean production. The grower has read a lot about potential problems with weed shifts and resistant weed populations and does not want them to be a problem in his/her field. Current weed problems include common lambsquarters, Palmer amaranth, common waterhemp, foxtail species, and large crabgrass.
Team members:

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Suggested K-State Resources:
SRL112: Soybean response to row spacing and seeding rates in Northeast Kansas.
SRL97: Corn soybean cropping sequences in the Kansas River Valley.

Scenario C: Grain sorghum production in North West Kansas

Location: Thomas County, west of Oakley, Section 17, T. 10 S., R. 33 W.

Planned rotation: grain sorghum – wheat – fallow

Switching to a no-tillage, dryland crop production system

General Description and Issues: Switching to a no-tillage, dryland crop production system from a long-term wheat-fallow system. Current key weed issues include summer annuals such as kochia, Russian thistle, and longspine sandbur, and winter annual grasses such as jointed goatgrass and Bromus spp. Should this producer consider other summer crops in the new rotation, such as sunflower?

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Suggested K-State Resources:
MF2085: Kansas winter annual grass weeds in winter wheat.
MF2317: Managing intensive non-irrigated cropping systems in western Kansas.
SRP594: Climate of Northwestern Kansas.
SRL123: Inhibition of wheat by sorghum residue under several tillage systems.

Scenario D: Alfalfa in southwest Kansas

Location: Kearny County, Section 26, T. 24 S., R. 38 W.

Planned rotation: Ten-year old, thinning stand of alfalfa, under irrigation. Winter cereal – corn rotation and return to alfalfa as soon as possible.
Select appropriate tillage system to take field out of alfalfa.

**General Description and Issues:** You are an alfalfa supplier for the developing dairy industry in the area. Perennial weed patches of field bindweed along with summer annual grasses like foxtail species and crabgrass showing up in thinning 10-year old alfalfa stand. What are the opportunities for organic hay and thus organic dairy production?

**Team Members:**

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**Suggested K-State Resources:**
L875: No-till alfalfa establishment after small-grain cereals.
SRL109: Interseeding alfalfa into declining alfalfa stands.
SRL117: Dormant-season seeding of alfalfa.
MF950: Double-cropping soybeans after fall-seeded or spring-seeded cereals in Southwest Kansas.

**Scenario E: Rangeland in Eastern Kansas**

**Location:** Greenwood County, Section 29, T. 25 S., R. 13 E.

**General Description and Issues:** With droughty conditions over the past several years, the rangeland has been overgrazed. Areas of invading weeds include musk thistle around the pond dam and watering areas, and sericea lespedeza popping up in recently over-seeded area in the northwest portion of the range. Eastern red cedars are mixed in with other shrubs such as honey locust and dogwood along waterways.

**Team Members:**

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**Suggested K-State Resources:**
MF1020: Rangeland Weed Management
L815: Prescribed burning as a management practice.
MF2408: Sericea lespedeza: history, characteristics and identification.
### Integrated Weed Management – Agronomy 650
#### Assignment: Developing IWM Recommendations

<table>
<thead>
<tr>
<th>Performance element</th>
<th>Excellent 10-9</th>
<th>Very Good 8-7</th>
<th>Good 6-5</th>
<th>Poor 4-3</th>
<th>Unacceptable 2-0</th>
<th>Points</th>
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<tbody>
<tr>
<td><strong>Organization</strong></td>
<td>Inviting introduction and great conclusion; information is presented logically with smooth flow</td>
<td>Clearly organized, moves reader through paper easily</td>
<td>Organized enough and generally follows a logical sequence but choppy.</td>
<td>Lack of clear direction, loose and strung together with little cohesion.</td>
<td>Not organized, not cohesive, separate parts by each peer without linkages.</td>
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<tr>
<td><strong>Ideas and Content</strong></td>
<td>Paper is very clear and focused, contains information as requested with sufficient explanation. Good use of tables and figures.</td>
<td>Paper is clear, contains information as requested, but more explanation needed. Included tables and figures.</td>
<td>Paper is clear but unfocused, provides information that distracts from purpose. One or few tables and figures.</td>
<td>Paper is not clear and is unfocused, missing some key information. Poor use or lack of tables and figures.</td>
<td>No clear sense of purpose or central theme, missing or excessive information beyond purpose.</td>
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<tr>
<td><strong>Recommendation</strong></td>
<td>Very complete, both 1- and 3-year programs, covered economic and environmental issues, weighed alternative controls</td>
<td>Complete, 1- and 3-year programs described, did not fully address economic and/or environmental issues. Discussed alternative controls.</td>
<td>Complete, 1- and 3-year programs, did not fully address economic and/or environmental issues. Some comment on alternative controls</td>
<td>Incomplete 1- and/or 3-year programs, did not comment on economics and/or environmental issues. Minimal comment on alternative controls</td>
<td>Incomplete 1- and/or 3-year programs, did not comment on economics and/or environmental issues. Minimal comment on alternative controls</td>
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</tr>
<tr>
<td><strong>References</strong></td>
<td>Information gathered from multiple sources, clearly documented</td>
<td>Information from multiple sources, but not well documented</td>
<td>Few sources used to gather information</td>
<td>Few sources used, not correctly documented.</td>
<td>No indication of sources used</td>
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<tr>
<td><strong>Mechanics</strong></td>
<td>Language was natural and effective, and punctuation, capitalization, spelling and grammar were correct. No errors interfered with comprehension</td>
<td>Language was natural and effective, few errors in punctuation, capitalization, spelling or grammar. Clear to comprehend.</td>
<td>Adequate word choice, few errors in punctuation, capitalization, spelling or grammar, but did not interfere with comprehension</td>
<td>Poor word choice, numerous errors that interfered with comprehension.</td>
<td>Numerous errors that significantly interfered with comprehension. Choppy and incomplete sentences, use of jargon and clichés</td>
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<tr>
<td><strong>Teamwork</strong></td>
<td>Peer evaluation</td>
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Integrated Weed Management – Agronomy 650
Oral Presentation for Developing IWM Recommendations
Date of Presentation: _______________________
Scenario: ________________________________________
Evaluator: ________________________________

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<thead>
<tr>
<th>Performance Element</th>
<th>Criteria</th>
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<tr>
<td></td>
<td>Excellent</td>
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<td></td>
<td>20 to 15</td>
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<tr>
<td>Organization and Team Collaboration</td>
<td>Information presented in logical, interesting sequence, which audience can follow. Seamless transition among presenters appeared to have practiced.</td>
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<td>Recommendations</td>
<td>Clear description of Scenario and 1- and 3-year recommendations, logical and complete</td>
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<tr>
<td>Breadth of IWM options</td>
<td>Recommendation explored all possible options within economic and environmental constraints of scenario.</td>
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<tr>
<td>Subject Knowledge – Responses to questions</td>
<td>Demonstrates full knowledge (more than required) with explanations and elaboration. Clear answers to questions.</td>
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<tr>
<td>Visuals (e.g. Powerpoint presentation), Mechanics and delivery</td>
<td>Effectively used text, tables, figures, and graphics to reinforce information presented. Loud voices, clear and good pace, audience engagement, presentation has no misspellings or grammatical errors.</td>
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TOTAL (100 pts)

Other Comments:
I really enjoyed the opportunity to reflect on the details needed in a syllabus. I have a challenge in regards to developing a reasonably common syllabus for two groups of students that will be enrolled in Agronomy 650 – Integrated Weed Management during the Spring 2007 semester: on-campus students and distance students.

Some key changes to the syllabus were a result from answering questions posed on the “Interaction One: Intellectual Content” worksheet, and from having to explain what my course is about to my peer reviewers.

Outcomes:

- I listed the specific prerequisite for the course – Agronomy 330 – Weed Science or what was equivalent.

- I added a section to describe the course goals and objectives in much more detail. Previously, the course catalogue statement was included, and the goals and objectives were implied but never explicitly stated. I think that was helpful.

- I reviewed the general description of assignments, and based on feedback from previous semesters, added necessary details.

Otherwise, I think my syllabus have evolved over the previous semester to now provide enough guidance to the students on what is expected in the course.

A separate document is the actual schedule for the semester, with key deadline dates in bold and proposed topics for each meeting period. I believe that it has also evolved to meet the student needs.

I feel that the current syllabus and schedule are very appropriate for this course and I feel ready to start the semester!
Post-Visit Memo for Classroom Visit #1 to Dr. Anita Dille’s class “Integrated Weed Management—650”

Interaction Two: Teaching Practices/Class Visit #1

I visited Dr. Dille’s class in 1014 Throckmorton on Tuesday, January 30th. Prior to my classroom visit Dr. Dille emailed a list of goals she hoped to achieve for that particular class meeting and a copy of the student assignment.

1. **Partner’s pedagogical goals and aspirations for student learning.**
   Dr. Dille assigned a current events project for her thirteen students entitled “Current Issues in Weed Management.” Her goals for the assignment included getting each student to participate and obtain a better feel for issues in the news regarding weed management.

   This assignment was very well organized and well planned. Each of the thirteen students had to locate a new article prior to the class meeting on 1/30. With article “in-hand” on 1/30 they broke into small groups (about 4 per group) and discussed each article for the first 20 minutes of class time (it is an 1 hour and 15 minute class). During this discussion period each group identified one article they felt was particularly interesting or relevant to report/summarize for the entire class. The common theme among all of the articles was weed resistance to commercial herbicides. Each group reported a variety of methods suggested by the authors’ of the articles ranging from re-treatment, to early treatment, to a combination canopy and herbicide method.

   **What worked best to achieve these goals?** What worked best about this assignment is it concretely connected their course work to the “real” world wherein they may encounter (if they have not already) weed resistance and need to think of multiple solutions to the problem. These students would be well equipped—I imagine—to draw upon—knowledge culled from the classroom discussions regarding contemporary theories of weed control/management. This assignment is an excellent pedagogical tool to help bring the reality of the “outside” world into the academic classroom environment. I also noted that Dr. Dille offers bonus points if the student(s) can locate an error in the article. I think this is a great way to encourage a very close reading of the material.

2. **Constructive Advice to better achieve these goals.** I believe Dr. Dille handled the assignment very well. After the current events discussion she moved into the second part of a lecture on “field sampling and scouting” that had direct relevance to the current events issues. I also noted that she drew upon her own research and data for the lecture, making the lecture more interesting in comparison to data culled from an anonymous site that perhaps would have had little correlation to plains environments or this student body. Dr. Dille also seems to have a good rapport with her class, maintaining a professional presence while also cultivating a comfortable atmosphere for discussion and questions.

   The only suggestion I have for Dr. Dille would be to perhaps compel the students who report on the article from the small group to add a bit more to their verbal summary. This
is a difficult, many students prefer to just report and stop rather than give an opinion or analysis. However, Dr. Dille did a great job of “pulling” more from the speakers in the group with targeted questions. I also noted that the students are required to turn in a written report/analysis of their articles for a grade.

3. **Specific responses, to questions, or issues mentioned by partner**
   Dr. Dille mentioned that she had hoped that the students would obtain a better feel for issues in the news regarding week management and I believe that she obtained this goal on 1/30. I look forward to my next class visit.

4. **Other information:**
   While the classroom that Dr. Dille uses is perfectly suitable for display of powerpoint and overhead displays, it is not particularly suited for a small class and discussion. It is a raked classroom with Dr. Dille at the bottom of the rake. Sound carries poorly in these classrooms making it difficult for the instructor to hear the students who are further away. I sat at the back of the classroom for my visit and had no difficulties hearing Dr. Dille, but I did have trouble hearing student sitting to my right. I wonder if the students can hear one another when they have a discussion? To combat this I would require all students to sit in the first six rows or so, just to avoid the problem. In the long term, I would probably try to find another classroom and use a portable projector. Dr. Dille also has the additional pedagogical challenge of needing to address students taking the course solely on-line. Their voices are not heard in the classroom but Dr. Dille does require that ALL enrolled students participate in pre-scheduled on-line discussions.

   There was one older gentleman sitting in back of the classroom who had several comments, opinions, and ideas. He seemed quite knowledgeable, but I wonder how often he attends, is he a regularly enrolled student? Does he audit? I also wonder if Dr. Dille sees his regular insertions into the discussion at all distracting or problematic (he did not participate in the small group activity I noticed). As a rather new instructor this guy may unnerve me, but Dr. Dille has more experience as an instructor than I and perhaps this is not an issue for her—I just found his range of knowledge and willingness to share it with the students a bit “out of the norm.”

   Overall, I sincerely enjoyed visiting Dr. Dille’s classroom. I took notes, I learned a lot and I think that we have much more in common, than we initially thought regarding subject matter and classroom approaches. I hope to foster a closer relationship in the future with the school of Agronomy and perhaps offer a course that would appeal to Agronomy students in the Department of History.
Post-Visit Memo for Classroom Visit #2 to Dr. Anita Dille’s class “Integrated Weed Management—650”

Interaction Two: Teaching Practices/Class Visit #2

I visited Dr. Dille’s class in 110 Throckmorton on Thursday, March 8th. Prior to my classroom visit Dr. Dille emailed a list of goals she hoped to achieve for that particular class meeting and a copy of the student assignment.

2. **Partner's pedagogical goals and aspirations for student learning.**
   Prior to the class meeting on 3/8/2007, Dr. Dille instructed students to complete a short homework assignment wherein each student researched a noxious weed species. Most students could visually identify each weed they were assigned, know how it reproduces, where it is commonly found (or at least where it has been reported to be found), and how it is controlled (if at all).

   **What worked best to achieve these goals?** This assignment seemed to work quite well in that each student could familiarize him or herself with a particular weed species but also learn about other noxious weeds by way of their classmate’s research. I believe Dr. Dille achieved the goals she established for this class session.

5. **Constructive Advice to better achieve these goals.**
   The only suggestion I have for Dr. Dille would be to perhaps have students post the research on KSO before class and then project the completed grid overhead on a screen to facilitate better viewing. But perhaps the assignment was already integrated with an on-line component? If so why not find a way to display the work completed on-line in the classroom?

6. **Specific responses, to questions, or issues mentioned by partner**
   The students appeared to be very engaged in this subject matter. A couple of the students drew from their own experience managing weeds on family farms. Thus, I could see the real-world usefulness of this course for many right there in the classroom, something that I think is a bit more difficult to “see” in a social sciences or humanities class room environment.

   I also thought it was particularly useful that Dr. Dille referenced the use of language in the field. She mentioned in her lecture/discussion that in fact using the word “invasive” to define a particular weed is necessary today in order to obtain grants or funding to study the weed and its environment. Clearly her own research experience can and does assist students who may go on to work as an advisory core for weed management, or consult for a agra-industrial company, or manage their own farm.
7. Other information:

The use of visual materials, circulars and advisory notices, published by various for organizations (some volunteer) served as a useful learning prop. Some of the students noted from their examination of these materials that nowhere on the informational materials issued by state, regional, or volunteer organizations appeared advice as to how to remove or handle the weed. In the case of some weeds, if they are uprooted they can cause illness, and in general expand their realm of propagation if the handler is unfamiliar with the weed. I thought this was an astute observation made by Dr. Dille’s students. I also thought it was a particular good idea to distribute a Xeroxed collection of the power point presentation for the students to follow along with and make notes on during the class lecture. Although this would likely be quite costly in a large class, it is a nice perk for a smaller class.

Again, I enjoyed my time in Dr. Dille’s class. Once again, I took notes and learned a great deal, particularly about some noxious weed varieties that can actually affect human health. As an environmental historian the connections or relationships between human, plant, insect, and animal species comprise the foundation of my own work. What better example can there be to support the argument that humans are both affected by their environment and affect the environment itself—than a weed that can actually provoke stroke-like symptoms in a human just through casual contact?

Also, I should note that having Dr. Dille in my class on 3/6 proved useful again as my students were able to ask some technical questions in relation to our reading on the history of rubber production via rubber trees in the Amazon. Now, more than before, I believe that combining teaching strengths for team-taught classes would greatly benefit the KSU students.
I visited Dr. Dille’s class in 1014 Throckmorton on Tuesday, May 1st. Prior to my classroom visit Dr. Dille emailed a grading rubric used by the students to evaluate their fellow classmates oral presentations and the “case study” summaries that each group worked on prior to their class presentation on 5/1.

3. Partner’s pedagogical goals and aspirations for student learning.

3 groups presented their projects on 5/1. All groups had common goals; they had to design a feasible 3 and 5-year project proposal for specific environmental conditions and address short and long-term obstacles for growing crops and/or raising livestock in various Kansas settings. I believe that some students grasped these concepts better than others, but this is usually the case across disciplines. The first group that presented seemed the least “dynamic” or least involved in their project. I suspect that much of this had to do with little communication between the 3 group members. The other 2 groups had a much more clear line of communication between members; subsequently their presentations were more interesting for the audience to hear.

What worked best to achieve these goals? This assignment seemed to work quite well and I would like to try and emulate the “case study” research project in my own classes as I think when students can see a real-world use for their knowledge they become more involved in the work and enthusiastic about the project. The final group that presented pulled much information from their own farming backgrounds and that was quite interesting. I can see how these students will apply knowledge from this class directly to their own family farms and agrac-                                                      

8. Constructive Advice to better achieve these goals.

I have little to add to this project, I thought it was a great idea and the execution by students is always uneven, some simply excel at presenting material better than others. One thing I have noticed about student presentation style is a lack of “professionalism” (this occurs in my classes as well). A lot of chatty language, no eye contact with the audience, and shuffling around. I wonder how we can impress upon students the need effectively convey information to others is necessary in any career?

Specific responses, to questions, or issues mentioned by partner

I was quite engaged with the material, and as always learned a great deal about Kansas and weed management. At times, I did feel a bit lost about subjects that must have been quite basic to agronomy students. Such as the “no tillage” variable in many of the case studies, I had no idea why “no tillage” was a preferred method in some farming
situations. However, I did learn by asking questions and I would love to learn more by perhaps team-teaching a course with Dr. Dille in the future, such an opportunity would certainly bolster my abilities to teach my own environmental history classes with more scientific knowledge to draw upon.

9. Other information:
I thought the idea of designating “graders” from class peers for the presentations was wonderful. I will likely adapt a similar strategy in my own courses. I think peer feedback is extremely useful, when applied and directed in a useful manner. Unfortunately, it has not always worked for me when I have had students evaluate their peers so I would be interested to see how the technique used on 5/1 in Dr. Dille’s class turned out.
Peer Review of Teaching - Interaction Three: Student Learning

**Reflection Memo:** Focus on *documenting* evidence of student learning/understanding/ performance and *reflecting* upon it with respect to achieving your overall teaching goals and objectives.

**Background:**
Assessment activities that occurred in Agronomy 650 – Integrated Weed Management

### Spring 2007 - Most Probable Grading System:

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<th>Possible points</th>
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<th>Your score</th>
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<td><strong>Exams:</strong></td>
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<td>First exam (lectures #1-10)</td>
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<td>Second exam (lectures #12-19)</td>
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<tr>
<td>Final (lectures #20-29)</td>
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<tr>
<td>Weed Control Recommendation - oral &amp; written</td>
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<tr>
<td>Other assignments (issues, message board, etc)</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td>100%</td>
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**Spring 2007 – direct from syllabus**

**Brief Overview of Course:**
We will explore the development of weed management recommendations based on assessment of weed problems, understanding crop-weed associations and interactions with the environment, management practices, and economics, and integrating weed control tactics such as chemical, biological, cultural, and mechanical practices into a recommendation.

**Course Goals and Objectives:**
The overall goal is to increase your confidence and to prepare you to develop and deliver recommendations to producers about managing their weed populations, and to do so by rationalizing decisions about use of pest management tactics for weed control, to protect the environment, to produce safe food, and to be profitable.

Through lecture presentations, assignments, exams, and a group project, you will gain practices in critical thinking, problem-solving skills, where to search for information, how to evaluate the reliability of that information, and present it effectively in order to develop and deliver the most appropriate and sound weed control recommendations.

At the end of this course, you should be prepared to complete portions of the Kansas Certified Pesticide Applicators Exam relative to weed science and application procedures.

Three assignments (descriptions appended):
1) Current Issues (three individual activities due over course of semester)
2) Critical Period of Weed Control (reading assignment, answer questions)
3) Weed Management Recommendations (group written report and oral presentation)
Agronomy 650 – Integrated Weed Management

Reflection Memo: Discuss how well students met the activity’s objectives based on evidence from student work.

1. **Is there evidence that students are meeting the specific learning goals you designed the assignment to assess? What criteria are you using to assess such understanding?**

**Current issues:** The specific learning goal was to “critically evaluate” information as published in either advertisements, population press, or even research articles, by summarizing, listing four to six questions, and researching an answer to one of those questions. Assignment description, grading rubric.

CI #1 = 13 students, average score: 17.08/20, high score 20/20 and low score 14/20. Median score 17/20

CI #2 = 13 students, average score: 17.73/20, high score 21/20 and low score 11/20. 5 of 13 students received 18/20, median score 18/20

CI #3 = 13 students, average score 16.31/20, high score 20/20 and low score 11/20. Median score 17/20

**Critical Period of Weed Control:** The specific learning goal was to “read, comprehend and interpret results” from two research papers by answering questions specific to the papers and translating results presented in a table into a graphical format. Grading rubric.

Informal review of student performance revealed significant lack of ability to interpret results (both comprehension and translation into graph).

**Weed Management Recommendations:** The specific learning goals were to “work as a team and to solve problems” for a given crop production scenario by developing a complete 1- and 3-year weed management recommendation plan given certain economic and environmental constraints. The recommendations were presented in both oral and written formats. Assignment description, grading rubric, peer evaluations.

Oral presentation (5 groups): Range of grades were 71.5, 83.1, 84.6, 92.6, and 94.3 / 100 (average 83.95/100)

Written report (5 groups): Range of grades were 64, 72, 75, 80, and 89 / 100 (average 76/100)

2. **What differentiates high/medium/low accomplishment in the assignments?**

The grading rubric for the two following assignments, CI and Weed Management Recommendations, clearly indicated how points were assigned. Students received copies of the grading rubrics when they were given full descriptions of the assignments.
3. **How do the criteria for the assignment relate to the intellectual goals you have set for the class?**

Within the description of each assignment, examples provided in class, and together with the grading rubric, the desired intellectual goals are clearly highlighted including ability to think critically, to solve problems, and to work in teams.

4. **Does performance in these activities indicate that students have developed an understanding of your field that will be retained and/or that can be applied to other contexts? How so?**

These activities were designed for upper division and MS students who have acquired technical knowledge in the area of weed science and are now interested in developing skills for future careers in production agriculture or as advisors to those involved in production agriculture such as county agents, agronomists, and consultants. If students can evaluate the materials that will be available to them in the future, such as new research results published in local magazines, or faced with a real-world field problem, that they will be professional in their steps towards understanding and solving those problems.

5. **Based on their work, are students learning ideas and/or skills that are central to the course and your teaching goals?**

I believe that the students are beginning to learn these skills but have not fully developed them at this time. Some students that performed at a high level have some degree of “critical thinking and problem solving” skills, but that most students, those at the medium and low level, have not developed these skills.

6. **Do their performances reveal misunderstandings or confusions about the assignment itself?**

This is the fourth time that the course has been offered with similar expectations, content, and assignments used over the past three times. Thus I don’t believe there to be confusion about the assignments themselves, since they have been modified in response to feedback from previous semesters.

7. **Do their performances reveal misunderstandings or confusions about the ideas and/or skills that are central to the course and your teaching goals?**

The syllabus clearly stated the goals for the course, such as critical thinking, problem solving, and working as a team. Other skills include ability to evaluate the reliability of information and present it effectively in order to develop and deliver the most appropriate and sound weed control recommendations. It may be that students are not explicitly told what “critical thinking” is and don’t explicitly practice this skill.

I believe that the writing skills of the students is poor in that they don’t know when and how to cite literature sources, that they use “chatty and colloquial phrasing” as Dr. McCrea also
observed, and there is a lack of completeness in their work such as no self-editing, no use of spell-checkers, and little desire for improvement.

Perhaps certain expectations need to be explicitly described as they are related to the skills central to this course and my teaching goals, such as:

a. Students have taken Weed Science and learned weed identification. It is expected that all weed species will be identified with correct full name, spelled correctly, and, if appropriate, full scientific name spelled correctly.

b. Students have taken Weed Science and reviewed herbicides. It is expected that herbicides will be identified by their active ingredient name (also known as common name) and rates are always described on a per unit basis, such as lb or g active ingredient / acre or hectare. If using the specific Trade name, then rates are expressed in units of gallons or lbs of formulated product / acre or hectare.

c. Always use correct English language in your writing for all assignments. This includes use of full sentences, grammatically correct with spelling checked. Do not use jargon, slang, or colloquial phrasing (definition: belonging to ordinary, everyday speech) but be professional in presentation and style.

d. Always provide a citation for any sources of information. This could be a personal communication with faculty, extension agents, agronomists, or producers (cited as: A. Name, personal communication). It could be an extension publication or web site link (cited as: Extension, B., year, title of publication, (web link), who published it, and how many pages, and if a web link, when did you retrieve it). It could be a specific research article (cited as: Researcher, A., B. Study, and C. Experiment. Year, Title of article, Journal, Volume:1-15.) Please follow specific guidelines outlined with assignment.

e. Etc.

8. What is the overall range of student performance in this activity? How do you account for this range? Are you satisfied with it? Did the student performance that you documented meet your expectations? Why or why not?

It is the expected overall range of student performance, with average and median grades of B, while there were several C-level performances, and a few A-level performances.

With reflection on individual activities:
Current Issues – I feel students did not fully grasp the idea of developing questions or questioning the information presented in a given advertisement or popular press article. I thought that these students would have gained sufficient technical background from the first Weed Science course to competently review information and determine its reliability.
Critical Period of Weed Control – This was an informal assignment given for the first time this semester. It was provided as an “Advanced Organizer” before a formal lecture presentation. Students were asked to supplement their answers with additional information gained in class, and then to turn in the assignment at the end of the period. Performance by students on key questions indicated that they did not understand the question in some cases, or did not know how to interpret results as presented in table or graph formats. If the current assignment is maintained as an “Advanced Organizer”, then a follow up quiz needs to be developed to ensure that students linked the information the organizer with the lecture information subsequently presented. A separate portion of a lecture will be needed to more fully explain how information is presented in table and graph forms.

Weed Management Recommendation – In the written report, students did a very poor job of citing sources of information, using proper English, and developing the recommendations fully. In some cases, the scenario requested specific information of concern for a producer and it was cursorily addressed or dismissed altogether. There was a lack of professionalism in the report. – In regards to the oral presentations, it was accidental that the gentlemen removed their caps for the presentation but is a key part of professionalism. Communication skills varied widely but this is a required skill of our graduates. The performances by the different groups varied and only a couple really met expectations.

9. How does their achievement of the goals of this assignment relate to the goals for your department’s curriculum or the university’s SLOs?

SLOs for undergraduate students graduating with a B.S. from the Department of Agronomy incorporate K-State SLOs with discipline-specific outcomes. Relevant SLOs include the following 7 out 10:
1) ability to think clearly and creatively, and to apply critical thinking skills when evaluating information;
2) application of scientific principles and problem solving skills to agronomy;
3) knowledge and technical competence in multiple areas of agronomy;
4) ability to learn, develop, and apply skills within the profession of agronomy;
5) development of competent oral and written communication skills;
6) competence in quantitative skills; and
7) ability to interact and communicate effectively within a diverse team.

The assignments in Agronomy 650 addressed these Agronomy Department SLOs and the performance of the students on the assignments begins to meet these SLOs. I believe that courses earlier in the curriculum may need to be modified to improve our students’ abilities to meet these SLOs.

10. What changes (if any) do you plan to make to this assignment, or the way you teach in preparation for this assignment, in the future? How do you think those changes will improve student learning?

Potential changes include:
1) Writing out more explicit expectations (see answer to question 7),
2) Provide examples of completed current issue assignments that show high / medium / low assessments to highlight what is expected.
3) Demonstrate how to cite sources of information (e.g., source of current issue)
4) Through demonstrations, how to read and interpret results from tables and graphs, and how to translate from one form to another effectively.
5) Follow up the “critical period of weed control” reading assignment with a knowledge quiz after the lecture presentation.
6) Demonstrate how to cite sources in support of written recommendation report.

Many of these changes are activities that address basic skills our students are expected to be competent in. Hopefully, short designed activities will provide practice for the students to meet the expectations of the SLOs and the course.