

Management of Agronomic Crop Insects

Entomology 896

Department of Entomology
University of Nebraska-Lincoln



Course Information

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About the Course

This course will focus on identification, biology, ecology and management of insect pests of agronomic crops, including, corn, soybeans, alfalfa, wheat and sorghum. Emphasis will be on Integrated Pest Management (IPM) strategies employed to maintain pests below damaging levels while minimizing the use of traditional insecticides.

This course assumes a basic understanding of insect biology and taxonomy and the basic principles of IPM. Previous coursework such as ENT 412/812 (Entomology and Pest Management), ENT 811 (Insect ID and Natural History), ENT 403/803 (Management of Horticultural Insects), or a similar course is suggested.

Learning Objectives

After completing the course, you should be able to:

1. recognize beneficial and harmful arthropods associated with agronomic crops
2. explain the biology and ecology of arthropods associated with agronomic crops
3. characterize types of plant injury and associate it with the arthropod pest that is responsible
4. describe management tactics that are used to minimize injury by arthropod pests

Instructional Method

There are 30 lectures, each ca. 60 minutes in length, that must be viewed as part of course requirements. These presentations will be supplemented with readings from internet websites and other selected references. Each student is expected to take good lecture notes and to complete all reading assignments. Items covered in lectures, but not covered in the assigned readings or handouts are fair game for examination material. Further, all reading material will not be discussed in class lectures, but the student is still responsible for being familiar with these parts of the assignments. All students are expected to conduct independent library research.

Textbooks

There is no required textbook; the following publications may be useful references to purchase for additional background information on the material covered in the course:

Handbook of Corn Insects



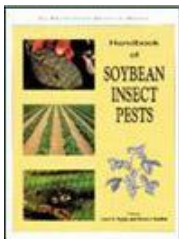
This handbook outlines fundamental approaches to corn insect pest management that can aid in reducing crop damage and loss. With contributions from 73 experts, it provides detailed descriptions of topics including insect identification, life-history data, and management options. This comprehensive guide includes discussions on corn ecology and physiology; corn insect pests, predators and parasitoids; and corn pest management procedures. Includes 158 color photographs, 132 illustrations, a directory of local information, and a glossary. Edited by K. Steffey, M. Rice, J. All, D. Andow, M. Gray, J. Van Duyn. 174 pp. 1999.

ISBN: 0-938522-76-0

Member Price: \$53.10

Nonmember Price: \$59.00 Handbook of Corn Insect Pests, available from APS at <http://www.shopapspress.org/haofcoin.html>

Handbook of Soybean Insect Pests



This handbook provides detailed information on soybean crop protection techniques with practical strategies for growers. This complete guide covers the ecology, physiology, and production of soybeans; the identification, injury diagnosis, and life history of soybean pests; pest control techniques; and beneficial organisms. 144 pp. with 92 color photos, 200 illustrations, distribution maps, a glossary, and sources for local information. Edited by L. Higley, D. Boethel. 1994.

Handbook of Soybean Insect Pests, available from APS at <http://www.shopapspress.org/haofsoinpe.html>

ISBN: 0-938522-29-9

Member Price: \$53.10

Nonmember Price: \$59.00

Handbook of Forage and Rangeland Insects



Forage and rangeland crops harbor a wide variety of injurious and beneficial arthropods. This new handbook will help individuals to identify these arthropods and to outline methods for their management. The book covers forage and rangeland crops in the United States and Canada. Edited by W. Lamp, R. Berberet, L. Higley, and C. Baird. (2007) 180 pages with index, 254 photos and maps, plus insect identification keys and illustrations.

ISBN: 0-9776209-0-5

Member Price: \$53.10

Nonmember Price: \$59.00

<http://www.shopapspress.org/>

Handbook of Small Grain Insects



This new handbook provides fundamental and important information about the management of small grain insects throughout the United States and Canada. Crops covered are wheat, barley, oats, rye, and triticale, with an emphasis on wheat. Edited by G. D. Buntin, K. Pike, M. Weiss, and J. Webster. (2007) 118 pages with index, 174 photos and maps plus insect and damage identification keys and illustrations.

ISBN: 0-9776209-1-3

Member Price: \$53.10

Nonmember Price: \$59.00

<http://www.shopapspress.org/>

Student Assignments and Exams

See Blackboard site (my.unl.edu) for additional information on scheduling and due dates

Exams: There will be 4 exams (3 exams and final), each of which is worth 100 points. Question formats will include definitions, short and intermediate length completion and essay formats. They will be open book.

IPM Summaries: Each student will prepare an IPM summary for 10 agronomic insects for which he/she will gather the following information: identifying characteristics for damaging stages, description of damage, summary of life cycle, procedures for scouting, assessment (sampling) of populations, recognized economic thresholds, and a list of

feasible management methods/control measures. Each summary will be worth 20 points.

Library Research Paper: Each student will be expected to write and submit one high quality, in-depth library research paper. The topic for the paper will be chosen by each student, but must be approved by the instructors in advance. Any course-related topic of special interest to the student can be considered. The term paper will be worth 100 points.

CHEATING:

The University of Nebraska-Lincoln has a policy about academic dishonesty, as indicated in the Student Code of Conduct (see Undergraduate Bulletin). As a student at UNL, you enjoy rights and protections under the code and are obligated to conduct yourself in compliance with the code.

As the Student Code of Conduct indicates, academic sanctions for misconduct subject to appeal are at the discretion of the instructor, and may include giving the student a failing grade for the course. In this course, the least penalty that will be imposed for misconduct is a one letter grade reduction in the course grade, but in most instances the penalty for cheating will be a failing grade in the course.

Grading

Exams	300 points
Final Exam	100 points
IPM Summaries	200 points
Library Research Paper	100 points
Total	700 points

Letter grades will be assigned based on straight percentages of 100 - 90% A range, 89 - 80% B ranges, etc.; however, we reserve the right to use a more lenient scale if needed.

SCALE

100 – 98	A+	89 - 87 B+	79 - 77 C+	69 - 67 D+
97 - 94	A	86 - 83 B	76 - 73 C	66 - 63 D
93 – 90	A-	82 - 80 B-	72 - 70 C-	62 - 60 D-
59 - Below	F			

Lectures

1. Corn seed and seedling insects
2. Corn leaf feeding insects
3. Corn sap feeding insects
4. Corn stalk boring insects
5. Corn root feeding insects
6. Corn root feeding insects
7. Corn ear feeding insects
8. Soybean seed and seedling insects
9. Soybean sap feeding insects
10. Soybean leaf feeding insects
11. Soybean leaf feeding insects
12. Soybean stem boring insects
13. Soybean pod feeding insects
14. Alfalfa sap feeding insects
15. Alfalfa sap feeding insects
16. Alfalfa root feeding insects
17. Alfalfa leaf feeding insects
18. Alfalfa leaf feeding insects
19. Sorghum seed and seedling pests
20. Sorghum sap feeding insects
21. Sorghum leaf feeding pests
22. Sorghum stalk boring insects
23. Sorghum grain head feeding insects
24. Wheat seed and seedling pests
25. Wheat root feeding pests
26. Wheat sap feeding insects
27. Wheat leaf feeding pests
28. Wheat leaf feeding pests
29. Wheat stem boring insects
30. Wheat head feeding insects