

CASE TEACHING NOTES

for

“Pesticides: Can We Do Without Them?”

by

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INTRODUCTION / BACKGROUND

This case was written for “Environmental Issues,” an introductory course taught in a Geosciences Department. The course is required for environmental studies/science majors, but most students are non-majors who take the course in order to meet their General Education requirement in the “Ethics” category. The overall goals of the course are to introduce scientific principles that are relevant to environmental issues and to help students appreciate that the causes of and solutions to environmental “problems” are complex. This case study would be appropriate for any introductory course that addresses human-environment interactions.

Underlying many current environmental issues are technological developments that have both positive and negative effects. The development of synthetic chemical pesticides (especially since World War II) illustrates that dichotomy. On the one hand, pesticide use has become widespread for a variety of purposes, including the obvious control of pests in commercial agriculture, but also for controlling various types of pests in homes, lawns/gardens, along road sides, etc. On the other hand, there are concerns about how such pesticide use may negatively affect the environment and human health. Rachel Carson raised these concerns in 1962 in her famous book, *Silent Spring*, and these concerns continue to be voiced today. This case study asks a fundamental question—*Can we do without pesticides?*—and gives students the opportunity to explore the ecological, ethical, economic, social, and political issues that are related to pesticide use.

Objectives

After completing this case study, students should be able to:

- define the terms “pest” and “pesticide” and give specific examples;
- discuss benefits and harmful effects of pesticide use;
- discuss implications of banning pesticides; and
- articulate the dilemmas underlying this case, including the ecological, ethical, economic, social, and political issues involved.

CLASSROOM MANAGEMENT

This case can be conducted in one 50-minute period, although longer class time could be devoted to it if desired. Specific prior knowledge about pests and pesticides is not required to complete this case. However, assigning specific readings (and modifying the questions accordingly) would allow for more in-depth discussion. For example, many introductory environmental science texts have sections on pests and pesticides that could be assigned ahead of time and serve as a springboard for discussion.

The case is in three parts and is designed to be taught using an “interrupted” method, in which there is progressive disclosure of the material: students read / discuss one part of the case before being given the next part. At the beginning of class, students should be placed into small groups of four to five students. The general format for running the case is as follows:

- Provide each student with a copy of the reading (one part at a time).
Suggestion: Copy each part on a different color paper to help keep things organized.
- Ask students to read the text and discuss the study questions in their small groups.
- Discuss the responses among the whole class.
Suggestion: Ask small groups to have at least one new spokesperson for each part of the case. That way, more students are active participants in the full-class discussion.
- Repeat the procedure with the next part of the case.

Suggested timeframe for this case is as follows: Part I—10 minutes; Part II—15 minutes; and Part III—20 minutes.

BLOCKS OF ANALYSIS

Part I—The Meeting

This part sets the stage for the case: a newly elected county commissioner is waiting for a commission meeting to begin. The main agenda item is whether to ban pesticide use in the county, and a number of interest groups are represented. It may be useful to remind students that although Johnsonville County and this commission meeting are fictitious, the scenario is realistic. A county commission could be considering such a ban, and they would likely hold a public meeting to get input prior to making a decision.

Part II—The Testimony

This part of the case includes more specific points that are raised in the commission meeting. Although the full text of each speaker’s comments is not included in the case study, there should be sufficient information for students to identify major benefits and harmful effects of pesticides. It may be helpful to generate two lists on the board during the full-class discussion of Questions 1 and 2.

Part III—The Vote

This part of the case shifts the students’ focus to the commission’s final decision on whether to ban pesticides in Johnsonville County. Although the scenario presented in this case is hypothetical, the underlying ethical issues and the varied implications of the decision (either in favor of or opposing the ban) are relevant to a variety of environmental issues.

ANSWER KEY

Answers to the questions posed in the case study are provided in a separate answer key to the case. Those answers are password-protected. To access the answers for this case, go to [the key](#). You will be prompted for a username and password. If you have not yet registered with us, you can see whether you are eligible for an account by reviewing our [password policy and then apply online](#) or write to answerkey@sciencecases.org.

FOLLOW-UP AND/OR EXTENSION

A follow-up assignment / activity specifically related to this case would be to have the students create a “Part IV—The Outcome” to the case: a resolution that addresses the major perspectives identified in the case. Sample assignment: *Acting as a Johnsonville County Commissioner, prepare a policy on pesticide use in Johnsonville County and provide a rationale for your decision.* This could be an individual or group assignment, and it could be in written format, an oral presentation, or both.

The following is a short list of related topics that could extend a unit on pests/pesticides:

- Research on state and federal authority regarding pesticides: At the federal level, the U.S. Environmental Protection Agency (EPA) has the authority to register pesticides for use in this country under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). See EPA's website for additional information: <http://www.epa.gov/pesticides/about/aboutus.htm>
- Review of current events news articles on pests/pesticides: For example, there have been recent news articles about several communities in Canada that are considering a ban on cosmetic use of pesticides on lawns.
- Research on Integrated Pest Management (IPM): This approach includes biological, mechanical, and chemical means for controlling pests. An underlying goal is to balance economics and environmental protection.
- Research on Rachel Carson's 1962 book, *Silent Spring*: In her book, Carson warned about the dangers of pesticide use. This book transcended the issue of chemical pesticides and is considered to have helped usher in the modern environmental movement. Some background information is available via links at The Online Ethics Center for Engineering and Science (Case Western Reserve University) website: "Rachel Carson: A scientist alerts the public to the hazards of pesticides." Available online: <http://onlineethics.org/moral/carson/>

REFERENCES

- California Department of Pesticide Regulation. Pesticide Info: What You Should Know about Pesticides. What is a Pesticide? <http://www.cdpr.ca.gov/docs/factshts/what2.pdf>
- Carson, Rachel. 2002 (40th Anniversary Edition). *Silent Spring*. Boston: Houghton Mifflin Company.
- Chiras, Daniel D., and John P. Reganold. 2005. *Natural Resource Conservation*. 9th ed. Upper Saddle River, NJ: Pearson Prentice Hall.
- Delaplane, Keith S. November 2000 (Reprint date). *Pesticide Usage in the United States: History, Benefits, Risks, and Trends*. Bulletin 1121. Cooperative Extension Service, The University of Georgia College of Agricultural and Environmental Sciences. <http://pubs.caes.uga.edu/caespubs/pubs/PDF/B1121.pdf>
- Miller, G. Tyler. 2004. *Sustaining the Earth*. 6th ed. Pacific Grove, CA: Brooks/Cole-Thomson Learning.
- National Pesticide Information Center (NPIC) (a cooperative effort of Oregon State University and U.S. Environmental Protection Agency). Pesticide Fact Sheets on specific pesticides and pesticide topics. <http://npic.orst.edu/npicfact.htm>
- U.S. Environmental Protection Agency Pesticide web site, with numerous links: <http://www.epa.gov/pesticides/index.htm>
- Wright, Richard T. 2005. *Environmental Science*. 9th ed. Upper Saddle River, NJ: Pearson Prentice Hall.

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