CASE REPORT

Farm Budget Generator as a Teaching Tool

Linda J. Cox, Gary R. Vieth, and Robert R. Coltman

Abstract

In this report, actual classroom validation in a graduate-level horticulture course at the University of Hawaii demonstrates how farm budget computer software programs can be used to help students grasp the basic economic concepts underlying production decisions.

Agricultural science instructors at the University of Hawaii have found that students who are training for a career in agricultural research rather than farm management often do not fully understand the economic principles associated with farm production decisions. At the University of Hawaii this is frequently true of students majoring in horticulture, agronomy and animal science. Already developed farm budget computer software programs are convenient instructional devices that can effectively help these students grasp the basic economic concepts underlying production decisions. An example illustrates how a budget generator provides this learning opportunity at the University of Hawaii.

Instructional Budget Generators

Ever since microcomputers were recognized as a valuable farm management tool there has been a proliferation of computer software programs commonly referred to as farm budget generators. These programs are designed primarily for use by farm managers and agricultural extension and research personnel. Most of the programs can be used with little or no previous computer experience. A typical program allows the user to enter the amount and price of each input used in a particular farm production system and the associated yield. The program then projects the total income, fixed and variable costs and net returns of the operation.

With a minimal amount of modification these simple computer programs can also be used to help agricultural science students understand the effect of changes in input variables on costs and returns. The advantage of using a computerized budget generator is its ability to quickly and accurately calculate the returns for each input/yield relationship the student may wish to analyze. This attribute helps achieve the conditions shown to be the most important in learning: contiguity, practice and feedback (DeCecco and Crawford, 1974).

An Example

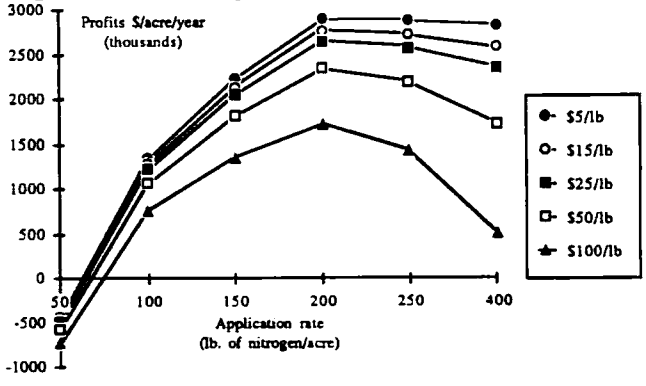
A computer software program called the *Vegetable Budget Template* is currently being used by the University of Hawaii agriculture extension program. The program is designed to operate with Lotus 1-2-3 on an IBM PC compatible microcomputer. For additional information on this program see Cox et al., 1987.

Cox and Vieth are assistant professors in the Department of Agricultural and Resource Economics, and Coltman is an associate professor in the Department of Horticulture, University of Hawaii, Honolulu, HI 96822

Recently, this program was used at the University of Hawaii as an instructional tool in HORT 650-Advanced Vegetable Crops. The computer exercise was conducted during one two-hour class session. The exercise focused on a lettuce operation since a substantial amount of factual information on lettuce farming in Hawaii was available. Actual field data was used to create the farm budget to ensure that cost-price-yield scenarios were realistic.

The students in the class were divided into groups of three. Each group was given three hypothetical production functions with three sets of prices for three different farm inputs: water, fertilizer and a herbicide. The students in each group were asked to work as a team to compute the net profit function associated with the various input/output scenarios using the budget generator. The results were then summarized in line graphs created with the Lotus 1-2-3 graphics program. One of the graphs is reproduced in Figure 1.

Figure 1: Relationship Between Profits and Fertilizer Use



The computer exercise was supplemented with a class discussion of the results of the budget generator and the reasons why lettuce farmers in Hawaii may not be using the optimal amount of a particular input. Formative evaluation by the instructor revealed that graduate science students can learn about real world problem-solving and deal successfully with such general concepts as diminishing rate of return, risk aversion and profit maximization.

The budget generator was found to be a time-efficient teaching tool. About eight hours of preparation time was required for the two-hour session. However, the majority of this time was spent entering data for the crop of interest into the budget generator. This data inputting step need only be done once since a budget file can be saved for use in future sessions. Formulating the three production functions took less than an hour. About a half-hour of instructional time was spent explaining to the students the purpose of the budget

generator. The students were then given about forty-five minutes to perform the computations using the budget generator and to graph the results. The remainder of the class time was spent discussing the implications of the results.

Conclusions

Following an applied use of a budget generator program agricultural science students were able to conceptualize the relationships among input quantities/prices, yield and profits. Students also saw possible applications of the budget generator that could be helpful in their areas of research.

References

Cox, L. J., S. T. Nakamoto, H. K. Marutani, P. Leung. (1987, March). "Economic Analysis of Vegetable Enterprises." *Journal of Computer Applications*, 2, 11-15.

DeCecco, J. P. and W. R. Crawford. (1974). *The Psychology of Learning and Instruction*. New Jersey: Prentice-Hall, Englewood Cliffs, New Jersey.

BOOK REVIEWS

Gerry L. Posler
Book Review Editor
Kansas State University
Manhatten, KS 66502

The NACTA Journal Book Review policy encourages the academic freedom of peers in the constructive criticism of unsolicited books submitted by publishers for review. The peer reviewers are persons who teach and/or conduct research in the subject matter area in which the book is written. A given review reflects the opinion of only the reviewer, and such opinions is not necessarily the opinion of NACTA and/or NACTA Journal.

Richard E. Austic and Malden C. Nesheim. *Poultry Production*. Thirteenth Edition. Lea and Febiger, 1990. 325 pp. Softbound $28.50.

Poultry Production is the oldest poultry science text to still be in use today. The first edition was printed in 1914 with W.A. Lippincott as the author. The text has been updated over the years with the twelfth edition being printed in 1979.

This new thirteenth edition does contain significant changes from the previous editions. For the first time in the history of the text, material on turkeys has been included. This is a most important improvement considering the emergence of the turkey industry. this edition contains twelve chapters, one less than the previous edition. In order to include the information on turkeys, an old chapter on "The Business of Poultry Keeping" was deleted.

Chapter one provides a very good overview of the poultry industry. It includes some useful charts outlining vertical integration of the egg and broiler companies. Chapter two covers the biology of domestic fowl. This chapter continues to provide one of the best discussions of the subject for undergraduate students. Information on identification of hens in lay is now included in this chapter. Chapter three deals with poultry breeding. Genetics, breeding systems and breeds are included in proper detail. Chapter four discusses incubation and hatchery management. In depth information is presented on chick embryology. There is also a good discussion of incubator and hatchery management. A brief section on artificial insemination is included in chapter four, although a photograph demonstrating semen collection was shown in chapter 3. Because of the importance of this technique to the turkey industry, a more indepth discussion might be useful. Also included in chapter four is information on chick processing at the hatchery. Much of this information is adequate. However, the section on beak trimming is somewhat dated especially when the photograph of the old 1960's style debeaker in included. chapter six presents a comprehensive discussion on poultry housing. good information on the requisites for proper housing are included. The topic of cages for laying hens is only minimally discussed. Examples of various cage designs and systems seem desirable. Chapters 7, 8 and 9 are concerned with poultry nutrition and feeding. All three chapters cover the subject in proper detail. Illustrations are of excellent quality. Chapter 10 covers diseases and parasites. This text is not intended to be a poultry disease manual, so it adequately acquaints students with the most common poultry diseases, internal parasites, external parasites, noninfectious diseases and behavioral problems. Chapter 11 addresses marketing eggs. Much information on the grading of eggs has been included as has eggs and egg processing. This chapter covers the subject adequately. Some of the photographs are apparently carried over from previous editions. this will be obvious to anyone familiar with modern egg processing equipment. chapter 12 covers marketing poultry meat and meat products. The first part of the chapter deals with processing. Few changes have been made from the previous edition. The photographs are again, not as recent as they could be. A discussion and photograph of automatic evisceration would have been appropriate because nearly all broilers are eviscerated by machine today. Some of the photographs representing "modern" equipment or products are at least as old as the 1960's. The second half of the chapter covers grading and market classes. Unfortunately, the specifications for grading were taken from a USDA Handbook printed in 1972. Revised grading standards were published in 1986, so some of the standards in Table 12-4 are outdated. The definitions of market classes were apparently taken from the same outdated source. Any knowledgeable poultry student will know that a broiler is not "usually 9 to 12 weeks of age" and that a young her turkey is not "usually 5 to 7 months of age." This type of outdated information should have been caught by the publisher's reviewers because these are at least early 1960 figures. It is especially regretful that this chapter is so poorly revised since the poultry meat industry is such an important employer for our students.

As a poultry student who used the tenth edition as a text during the 1960's and as a professor who used the eleventh and twelfth editions in class in the 1970's and early 1980's, it was exciting to see a thirteenth edition. But after carefully studying it, the overall revision effort is disappointing. Instructors who select this text for their classes would be wise to furnish their students with more up-to-date information in certain areas. Several portions of the text are adequately revised and it is certainly noteworthy that turkey management has been included. It was also good to have it available in paperback to keep the cost lower.

Lyndon N. Irwin
Professor of Animal Science
Southwest Missouri State University

NACTA Full Peer Review, Supports Publication Credit for Media Creations

As teachers in colleges of agriculture in the United States and Canada, we are all aware of the tremendous effort required to develop excellent quality instructional materials. As members of NACTA we have the opportunity to have many of these media reviewed by our peers similar to research or book reviews. As goal of NACTA is to obtain "Publication Parity" for instructional media of merit.

Only media developed in the last 24 months can be reviewed. Media includes computer software, videotapes, 16mm films, transparencies, audio cassette or tape, slides, filmstrips or models. Send the completed coupon below for the forms needed to accompany your submission of media. The rest is easy.

Victor A. Bekkum, Ag. Eng. Dept.
214a Davidson Hall, Iowa State University
Ames, IA 50011

Please send me instructions and forms to submit media for review.

Name: _____

Address _____

_____ Zip _____