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A NATIONAL SURVEY OF ENTERPRISE BUDGET DEVELOPMENT AND USE BY THE EXTENSION SERVICE

by

Douglas W. Eck

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF AGRICULTURAL INDUSTRIES

in

Economics

Approved:

UTAH STATE UNIVERSITY
Logan, Utah

1990

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My ever-supporting and understanding wife, Connie, and children, Dusty and Laci, provided the ultimate incentive towards successfully completing this thesis. For their love, patience, and sacrifice I am forever indebted.

Douglas Eck

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ABSTRACT

A National Survey of Enterprise Budget Development
And Use by the Extension Service

by

Douglas W. Eck, Master of Agricultural Industry
Utah State University, 1990

Major Professor: Dr. DeeVon Bailey
Department: Economics

This thesis investigates the development and use of agricultural enterprise budgets. An enterprise is a single crop or livestock commodity, and enterprise budgets are valuable management tools. They serve as the basic building blocks of complete farm planning.

Two separate surveys gathered information from the Extension Service concerning the use and development of enterprise budgets. Analysis of the survey results identified the most common methods used to create enterprise budgets as well as factors that contribute to their use.

A regression analysis was performed to determine the factors influencing the number of times county agents directly refer to published budget information in a year. The agent's understanding of the use of budget information in management decisions, the geographic units that budgets

are published for, and receiving the budgets in multiple forms (e.g., sheets, booklets, or software) have significant positive impacts on the use of budgets by the agents.

Finally, based on the findings of this research, a number of recommendations are made to help increase the efficiency with which budgets are made and the use of these Pvaluable tools.

(108 pages)

CHAPTER I

INTRODUCTION

The field of agriculture has changed dramatically in the last few decades. From 1940 to the present, agriculture has witnessed a technological revolution. A steady flow of new and improved fertilizers, seeds, feed additives, insecticides, herbicides, machines, and buildings has increased the efficiency of agricultural producers (Kadlec). The average yield of corn in the United States increased from 28.4 bushels per acre in 1940 to 119.4 in 1987 (U.S. Department of Agriculture, Agricultural Statistics). While agricultural production has been increasing so dramatically, the number of agricultural producers has been decreasing rapidly. For example, in 1940 each agricultural producer produced enough food to feed himself and ten others. By 1981 this number had increased to 78 (Kadlec). Changes in agricultural technology, communications, transportation, capital requirements, human capital, and the size and nature of agricultural industries have introduced a new era in agriculture.

These changes demand a new approach to management of the farm or ranch business. The successful agricultural producer can no longer focus solely on production but must understand and skillfully apply management concepts to the business. A projection of average annual costs and returns

for an agricultural commodity is commonly referred to as an enterprise budget. An enterprise is a single crop or livestock commodity. Enterprise budgets are important management tools used by farm and ranch managers for planning and decision making. They can be used to select the most profitable plan among a number of alternatives or test the profitability of a proposed change. Enterprise budgets are a way to "try it out on paper" before implementing a plan or change.

Extension agents, conservation project planners, agricultural lenders, consultants, government officials, and other agricultural production, finance, and marketing professionals also use enterprise budgets. Enterprise budgets are essential elements in conducting economic feasibility studies, whole-farm planning analyses, and market-window analyses, which should lead to an increasing demand for the information available from complete and accurate enterprise budgets.

Utah State University currently provides enterprise budgets to the public for a number of crop and livestock enterprises. These budgets are published in the annual editions of Utah Agricultural Statistics. While the current distribution system is working well, the budgets need refining to make them more consistent and accurate.

Currently, the state of Utah has no standard for developing enterprise budgets. The Utah Agricultural

Experiment Station, Utah State University Cooperative Extension Service, and Utah Department of Agriculture have jointly commissioned this study to achieve the desired standardization. An accurate and consistent set of enterprise budgets should increase reliability and usability.

Objectives

This project analyzed the various methods used to create enterprise budgets and the factors that lead county agents to use these valuable tools. Specific objectives of the project were to:

1. determine the procedures used in other states to develop and disseminate enterprise budget information

2. analyze how well the methods used by the various states function in terms of use by "front-line" extension personnel (county agents) and

3. recommend procedures for constructing enterprise budgets in Utah.

Procedures

The data for this research were largely established by designing and conducting surveys. The first objective was accomplished using an extension specialist survey. The survey was designed to collect information from other states concerning the methods they use to generate their own

enterprise budgets, any computer software used in the process, and techniques found to be the most successful for collecting the necessary data. The survey also inquired into other characteristics of the state's enterprise budgets such as their distribution and use. Based on the survey results and taking into consideration the nature of Utah agriculture, a list of recommendations for developing enterprise budgets in Utah is provided.

A survey of a random sample of county agricultural agents was used to achieve the second objective. This survey concentrated on the use of enterprise budgets within the particular county as well as characteristics of the budgets and demographics of the county. Regression techniques were used to determine the factors influencing the frequency with which county agents refer to enterprise budgets. In addition to meeting the second objective, results of this survey also contribute to the recommendations being made concerning the construction of enterprise budgets in Utah. For example, budget characteristics that lead to the use of enterprise budgets are included in the recommendations.

This research provides information to aid in the development of precise and coherent enterprise budgets. Availability of such budgets should result in an increase in budget usage. Derived results of this work should also contribute to a better understanding of the possible

economic problems and opportunities for the agricultural community of the state.

This thesis is divided into five chapters. Chapter II analyzes relevant similar studies. Chapter III describes the methodologies used in the study. Chapter IV amalgamates the results of the project, and Chapter V summarizes, concludes, and offers recommendations for developing enterprise budgets.

CHAPTER II

LITERATURE REVIEW

Farm and ranch management has become an increasingly complicated and demanding task. Our nation's farms and ranches are becoming larger and larger; the capital requirements necessary to operate these agricultural businesses have increased dramatically, as have the types and number of factors that affect agriculture. Abrupt changes in the supply and demand of agricultural products has provoked a wide fluctuation in agricultural commodity prices. Under such circumstances, farm and ranch managers must spend a considerable amount of time planning and preparing before committing money and resources to actual production. Management has always been important in agriculture but never more so than it is currently. The new era in agriculture mentioned in Chapter I of this thesis could well be called The Management Era.

Farm Management

Farm and ranch management entails making decisions that affect the operation and profitability of the farm or ranch. Management can be divided into three major functions: planning, implementation, and control (Olson et al; Kay; Boehlje and Eidman).

The planning function is the determination of a course of action, including defining the overall goals of the business, obtaining the necessary information, and identifying and analyzing practical alternatives. The analysis of potential plans uses economic principles and budgeting techniques (Kay). To be effective, planning requires detailed information. Boehlje and Eidman indicated that enterprise budgets enable a farmer or rancher to determine the quantities of various inputs, such as feed and fertilizer needed, and the expected returns that will be generated for each unit of the enterprise.

Once the planning function is complete, the second major function of management is the implementation of the chosen alternative. Implementation involves the acquisition and organization of the livestock, land, labor, capital, machinery, or other inputs needed to meet the chosen objective.

The control function is accomplished by comparing the results of the implemented plan with the business's initial goals and objectives then taking necessary corrective actions to keep on track. The control function requires farm or ranch managers to compare actual technical efficiency to the expectations included in the projected budgets prepared during the planning function (Boehlje and Eidman).

Used in all phases of farm management (planning, implementation, and control), enterprise budgets provide critical information for decisions regarding product choices and production methods (Olson et al.). Enterprise budgets are an essential element in the formula for successful farm management.

Purpose of Enterprise Budgets

Osburn and Schneeberger gave perhaps the most general purpose for enterprise budgets when they said, "The purpose of enterprise budgets is to provide economic data to assist the farm/ranch manager in evaluating options" (p. 181). Budgets can provide details for decision making concerning a production period, an annual plan, or a long-run plan. Budgeting can help a manager by providing information about each individual enterprise or the whole farm or ranch (Olson et al.). In addition, Kadlec stated that enterprise budgets are very useful in identifying areas of management that need improvement.

Selecting the optimum combination of crop and livestock enterprises remains one of the most challenging responsibilities of the farm or ranch manager. This task not only involves determining which enterprises are the most profitable but requires the fitting together of the different crop and/or livestock enterprises. The manager must also determine the size of each enterprise, the amount of resources that will be devoted to each enterprise,

enterprise rotation, and the priority of each enterprise. In his farm management text, Efferson devoted an entire chapter to the selection of enterprises and concluded that enterprise budgets will help determine the relative profitability of different enterprises. Budgets can also be used to indicate if a given enterprise should be expanded or dropped entirely (Castle et al.).

Kay noted in his work that enterprise budgets also help set price support levels for government farm programs, are useful in planning the marketing strategy of agricultural products, and can be used to determine the maximum rate for land rental.

Developing an Enterprise Budget

Numerous budget generators have been developed and used to construct enterprise budgets. Today though, more and more budgets are being prepared on electronic spreadsheets. Luening and Mortenson gave the following eight steps for preparing an enterprise budget.

1. Develop a description of the enterprise (for example, 100 acres of corn grain, 40 dairy cows producing 14,000 pounds of milk per year).

2. Select appropriate coefficients of production such as soil type, topography, and climate conditions.

3. Select appropriate input and output prices.

4. Develop the receipt or income part of the budget.

5. Develop the cost part of the budget (variable and fixed costs).

6. Calculate the returns to the enterprise.

7. Make appropriate notes as to assumptions used in the budget.

8. Use the budget for forward planning, decision making, and evaluation. (p. 270)

According to Boehlje and Eidman, the format commonly used for enterprise budgets may contain the following parts: the title, livestock investment, receipts, operation costs, ownership costs, returns above costs shown, footnotes, and seasonal distribution of inputs. They describe each part as follows.

The title of an enterprise budget should contain the name of the product being produced, indicate the unit for which the estimates are being prepared, and describe the system of production. Other important information that might be included in the title include the proposed marketing method, soil type on which the crop will be grown, irrigation method, etc.

A livestock budget may include a section called a livestock investment, which is a list of the average number of animals in the herd by type. Such a list describes the composition of the enterprise and helps to estimate the investment in livestock.

The receipts section of a budget lists all of the products from the enterprise that will be marketed in a

one-year period. Each product is assigned the expected market price and the total receipts for each product are calculated.

Operating cost are essentially variable costs. The operating costs section of a budget should include each operating input, its unit of measure, quantity used, price, and value.

Ownership costs are fixed costs, costs that the producer bears whether or not the enterprise is producing. Ownership costs may include depreciation, interest, insurance, and taxes.

Returns above costs shown are obtained by subtracting total cost (operating and ownership) from total receipts. A negative return indicates that the enterprise did not cover the fixed resources allocated to it.

Information and explanations needed to understand the budget that are not contained in the body of the budget are included in the footnotes. Examples of footnote items are pesticide names, leasing agreements, and explanations of expenses.

The seasonal distribution of inputs is a summary of the resources devoted to the enterprise at different times during the year. At a minimum it should include labor and capital requirements but may also contain building and facility requirements, machinery, pasture, and irrigation requirements. Knowing the seasonal distribution of inputs

can be very helpful in developing a financial plan as well as the whole-farm plan.

According to Osburn and Schneeberger, an enterprise budget represents only a single point on a production function. A change, such as a different fertilizer combination, represents a different point, requiring that the budget be altered or replaced.

Sources of Enterprise Budgets

In addition to the budgets prepared by individual farmers and ranchers, budgets are also developed by a number of private, state, and federal agencies. Commercial management services, extension specialists, and vocational agriculture farm management specialists prepare budgets for most of the commodities grown in their states or regions. Osburn and Schneeberger mentioned that the Economic Research Service of the USDA develops farm enterprise budgets known as FEDS (Firm Enterprise Data Systems) budgets. FEDS budgets are available to the public.

While a great deal of work has been and will continue to be done in preparing and modifying enterprise budgets, very little has been done on analyzing the methods used to create budgets. This thesis examines various methods of constructing enterprise budgets and evaluates their effectiveness.

CHAPTER III

METHODOLOGY

This chapter describes the methodological procedures used in this study. Additionally, this chapter overviews enterprise budget construction and the reasons for developing enterprise budgets. Two separate telephone surveys were conducted. The first dealt with budget construction and targeted those responsible for enterprise budget development in each of the 50 states. The second survey focused on the demand for enterprise budget information and use of enterprise budgets by county agricultural agents. Finally, a regression analysis was performed to determine what factors contribute to the use or non-use of enterprise budgets by county agents.

Budgeting

An enterprise is a single crop or livestock commodity; most agricultural producers produce a combination of several enterprises. An enterprise budget is an estimate of the costs and returns associated with a specific enterprise. Each budget is usually developed on the basis of a common unit such as per acre for crops or per head for livestock. Enterprise budgets are used in a variety of ways. The following list was taken from Using And Understanding Budgeting and the Microcomputer Budget Management System by

Olson et al.

1. Budgeting helps the manager select the best crop and livestock enterprise combinations.

2. Budgeting can be used to refine organizational and operating structures; it also forces a manager to develop a production and marketing plan.

3. Budgeting forces the manager to uncover cost items that might otherwise be overlooked.

4. Budgeting allows the possible outcomes of a change to be studied before resources are actually committed to the change.

5. Budgeting can be used to test the economic and financial feasibility of alternative production technologies and management practices.

6. Budgets can be used to develop and organize information which will be useful to lending agencies when the business needs operating, intermediate, or long-term loans.

7. When credit is limited, budgeting can help the manager select among investments by estimating both the profits and the impacts on cash flow of each investment.

8. Budgets provide information which the manager can use to compare the projected and actual results of implementing a plan. (page 5,6)

Budgeting provides details not only about individual enterprises but also about the whole farm or ranch management plan. Reliable, timely enterprise budgets function like a road map made especially for agricultural producers. By carefully following and using this resource, producers can gain insight into the production possibilities of their own operations. For example, an estimate of the expenses associated with an unfamiliar enterprise, an idea

of the expected returns from a new enterprise, or crucial information on the compatibility of two different enterprises can be obtained from enterprise budgets. Knowledge of this type is of primary importance to the agricultural producer trying to determine an optimum enterprise combination.

Preparing an enterprise budget requires a precise analysis of the operating procedure used to produce the commodity. The manager must consider each aspect of production. For a crop enterprise, this includes all functions from ground preparation to marketing the product. As a secondary benefit, this type of in-depth examination forces the development of a production and marketing plan for the commodity. It also impels the manager to identify and consider expenses that might otherwise go unnoticed.

Frequently managers will contemplate changes dealing with agricultural production. This might include adopting a recently developed technology, increasing an input such as seed or fertilizer, or perhaps changing inputs all together. Integrating such changes into an enterprise budget allows the possible results of the change to be studied before investing the required resources. In addition, the manager is able to examine the economic feasibility of the anticipated modification.

Enterprise budgets have numerous financial applications. Currently, most lending agencies require

customers to present a cash flow budget or similar financial record. Enterprise budgets are essential in the preparation of these statements. Without estimating the returns from a particular commodity and the expenses required to produce it, the manager has no way of determining the commodity's financial contribution and consequently is unable to produce an accurate cash flow budget. Another vital financial application of enterprise budgets is in financial planning. The information available from an enterprise budget provides the basis for the whole-farm financial-management plan.

Enterprise budgets prepared prior to the implementation of a project provide a means of comparing the projected and actual results of the project. Management has become a demanding, dynamic process for the agricultural producer. In order to be successful, the manager must use a variety of management tools and resources. Enterprise budgets are among the most valuable.

Construction of Enterprise Budgets

Enterprise budgets can be organized and presented in several different forms, but they typically contain four sections: income, variable costs, fixed costs, and a brief financial analysis. Examples of enterprise budgets for corn and cow/calf production containing these four sections are shown in tables 1 and 2.

The first section of an enterprise budget calculates the income expected from the sale or service of the

Table 1. Enterprise Budget for Corn Production

Item		Value Per Acre
Income:		
120 bushels @ $3.00 per bu.		$360.00
Variable Costs:		
Seed	$24.00	
Fertilizer and lime	50.00	
Chemicals	20.00	
Machinery fuel and repairs	24.50	
Drying expense	18.00	
Hauling	10.00	
Labor @ $6 per hour	26.00	
Miscellaneous	5.00	
Interest on variable costs (12% for 6 months)	10.65	
Total variable cost		$188.15
Income above variable costs		$171.85
Fixed costs:		
Machinery depreciation, interest, taxes, and insurance	$ 52.00	
Land charge	$100.00	
Total fixed costs		$152.00
Total costs		$340.15
Estimated profit		$ 19.85

Source: Kay, R.D. Farm Management

Table 2. Enterprise Budget for Cow/Calf Production

Item		Value per head
Income:		
Steer calf (0.45 hd at 450 lbs at 68¢)	$137.70	
Heifer calf (0.35 hd at 420 lbs at 62¢)	91.14	
Cull cow (0.10 hd at 900 lbs at 40¢)	36.00	
Total		$264.84
Variable costs:		
Salt and minerals	$ 2.50	
Purchased supplement	11.50	
Hay	34.00	
Pasture maintenance	16.00	
Veterinary and medicine	6.00	
Repairs—fences, building, equipment	5.25	
Machinery expense	4.50	
Hauling and marketing	6.00	
Labor	24.00	
Miscellaneous	5.00	
Interest on variable costs (10% for 6 months)	5.74	
Total variable cost		$120.49
Income above variable cost		$144.35
Fixed costs:		
Land charge	$ 85.00	
Depreciation—bull	5.50	
Depreciation—fences, buildings, equipment	5.20	
Interest on livestock investment	32.50	
Interest on fences, buildings, equipment	8.30	
Total fixed cost		$136.50
Total cost		$256.99
Estimated profit		$ 7.85

Source: Kay, R.D. Farm Management

enterprise. There are two basic components to this section: total production and commodity selling price. Since an enterprise budget is usually a projection of the costs and returns for some future period, such as the coming year, total production and commodity selling price are the manager's best estimate. Some factors that must be considered when estimating total production for a crop enterprise include soil quality, tillage procedures, levels of fertilizer, seeding rates, and irrigation. For a livestock enterprise, feeding practices, replacement rates, and death loss will affect total production. Economic trends, supply and demand, and previous selling prices are among the most important factors to consider when estimating a commodity selling price. Great care should be taken in estimating each of these values because they significantly affect enterprise profitability.

Costs can be classified in various ways, but two broad categories, variable costs and fixed costs, are appropriate for enterprise budgeting purposes. The next section of an enterprise budget contains the computation of variable costs incurred in the production of the commodity. Variable costs change as total production changes. They are a function of the level of output and occur only when attempting production. Variable costs (such as seed, fertilizer, short-term interest, and chemicals for a crop enterprise and feed, seasonal labor, medical supplies, and feed

supplements for a livestock enterprise) are relatively easy to calculate and allocate to the proper enterprise. The quantity used and price of the input are usually known or easy to obtain. Other variable costs, such as labor, machinery or building repairs, fuel, and lubricants, can be difficult to allocate to an enterprise, particularly on a per-acre or per-head basis.

The fixed costs associated with the enterprise are listed next in the budget. Fixed costs are not a function of the level of output; they remain the same regardless of the level of production. Examples of fixed costs include depreciation on buildings and machinery, taxes, rent, annual labor, land expenses, and long-term interest.

For those interested in a more detailed division of costs, both variable and fixed costs can be subdivided into cash and non-cash costs. Variable cash costs are quite straightforward; they include money paid to cover operating procedures and purchase inputs. Intermediate products, such as grain or alfalfa produced and fed on the farm, are variable non-cash costs. Had they not been used they could have been sold to produce revenue. Fixed cash costs are the money outlays required notwithstanding the level of production. Fixed non-cash costs are costs borne over time as an opportunity foregone. Depreciation on farm equipment and buildings are examples of fixed non-cash costs (Boehlje and Eidman).

The final section of an enterprise budget constitutes a brief financial analysis of the budget results. Total costs are subtracted from total revenue to determine expected profits. Return to land and management as well as return to management and risk are other results that can be calculated and included in this section. Frequently, a simple break-even analysis for the enterprise is also included in this section.

Sources of Enterprise Budgets

As previously mentioned, a host of professionals associated with agriculture and agricultural production use enterprise budgets. Consequently, in addition to the budgets produced by individual agricultural producers, enterprise budgets are constructed by a number of individuals and organizations. The United States Department of Agriculture publishes enterprise budgets for a multitude of different commodities in their annual series, Economic Indicators of the Farm Sector. Some state colleges develop and distribute enterprise budgets for commodities produced in their local areas. Some private agricultural consultants also construct enterprise budgets. But the group constructing the majority of enterprise budgets available is the Cooperative Extension Service (CES) at the state land-grant universities.

Enterprise budgets prepared by agricultural producers are most beneficial when they are based on the producer's

actual receipts, costs, and specific operating procedure. The generalized budgets prepared by government agencies, state colleges, and land-grant universities differ from specific-producer budgets. These somewhat generic budgets represent the average or typical receipts received, costs incurred, and operating procedures used to produce the enterprise in the appropriate geographic area.

Some geographic areas that enterprise budgets are based on include a particular region of the country; an entire state; individual districts within a state; and a region within a state with a certain characteristic such as soil type, irrigation method, or tillage method. Enterprise budgets are also based on specific counties and, of course, on individual farms.

When agricultural producers prepare a budget for an enterprise they are producing or planning to produce, they are usually familiar with the price and input coefficients that will be included in the budget. The institutions and agencies that construct budgets rely on external sources for much of the information that is included in their budget calculations. For example, local cash markets, contract markets, government price-reporting services, county agents, extension specialists, agricultural producers, and subscription price forecasts are common sources for the price and projected output information needed in the income section of an enterprise budget. County agents, extension

specialists, and agricultural producers are also sources of the input information needed to calculate the variable costs and fixed costs for an enterprise. Other sources of input information are farm management groups, suppliers, private consultants, and university agronomy departments.

Enterprise budgets are constructed using several different techniques. Budget generators, spreadsheets, and manual calculations are commonly used to create enterprise budgets. Methods used to obtain price and input information include face-to-face interviews, telephone interviews, producer panels, and surveys. Producer panels and other face-to-face contacts are usually considered superior methods for obtaining information since more accurate data is likely to be obtained as producers discuss input coefficients among themselves. Also, suppliers are less threatened if they are assured that confidentiality will be maintained and a competitor is not also obtaining the information. In this study, an extension specialist survey was used to determine which methods of gathering budget data are most prominent at land-grant institutions in the United States. This information lends insight into what resources are required to gather information by the various methods.

Extension Specialist Survey

Most land-grant institutions have a standardized procedure for constructing, organizing, and distributing the

enterprise budgets they develop. For instance, Oregon State University develops 120 crop budgets and 10 livestock budgets on a four-year rotation. Thirty crop budgets are updated each year, and once every four years all 10 livestock budgets are updated. The Oregon State University Extension Service provides 60% of the funding for the budgets; the remaining 40% is contributed by the Department of Resource and Agriculture Economics. The budgets are prepared by one of the extension farm-management specialists and require about 60% of his or her time each year. Both crop and livestock budgets are based on geographic regions of the state. The budget generator MBMS (Microcomputer Budget Management System) is used to prepare the budgets. County agents in Oregon receive direct training concerning enterprise budgets and play a significant role in the collection of information used in the budgets. Additional sources of price and input information include producer panels and field representatives. The budgets are authored by both the farm-management specialist and contributing county agents. They are distributed as individual budgets and software primarily through the county extension offices (Cross).

Utah has no such standardized system. In the past, Utah enterprise budgets have been prepared both manually and on a spreadsheet by personnel associated with the Economics Department at Utah State University. Previously budgets

have been published and distributed as Utah Agricultural Experiment Station research reports and as part of the Utah Department of Agricultural annual statistical report (Utah Agricultural Statistics). The distribution system appears to be working well; however, the procedure for developing and constructing the budgets needs to be improved and standardized.

A survey instrument designed to ascertain ideas and information on budget development from other states focused on such areas as (1) frequency with which enterprise budgets are constructed, (2) number and source of requests for budgets, (3) funding for budget preparation, (4) time involved in budget construction, (5) method of budget construction, (6) geographic basis upon which budgets are developed, (7) sources of price and input information, (8) use of producer panels, (9) involvement of county agricultural agents, (10) respondent opinions on the amount of resources devoted to budgets, (11) form in which budgets are published and distributed, (12) authorship of budgets, and (13) extension assignment of the respondent. A committee within the Department of Economics at Utah State University participated in developing the research instrument to ensure accuracy and usable results. A copy of the survey is included in Appendix A.

The researcher conducted the extension specialist survey by telephone in August and September of 1989. The

attempt was made to contact the farm-management specialist primarily responsible for the compilation of enterprise budgets in each of the 50 states. Farm-management specialists are usually faculty members at the state's land-grant university, and most have extension assignments. The annual reference directory for agricultural extension workers (County Agents) provided their names.

Of the survey respondents, nearly 70% had more than a 50% extension assignment (figure 1). At least one-third of the respondents have less than five years experience in extension (figure 2). This indicates a relatively new extension staff dealing with the construction of enterprise budgets. It may also mean that budget development is often delegated to newcomers, which may indicate some reluctance by older staff members to assume this responsibility. Suggesting that budget development is not a highly rewarded or sought-after responsibility. In any case, a significant amount of on-the-job training in constructing budgets is occurring in many states. Figure 3 provides an analysis of the numbers of years the respondents have been in their current positions.

County Agent Survey

A second survey dealt with use and availability of enterprise budgets at the county level. This survey attempted to determine the demand for agricultural budget information from county extension offices. County agents

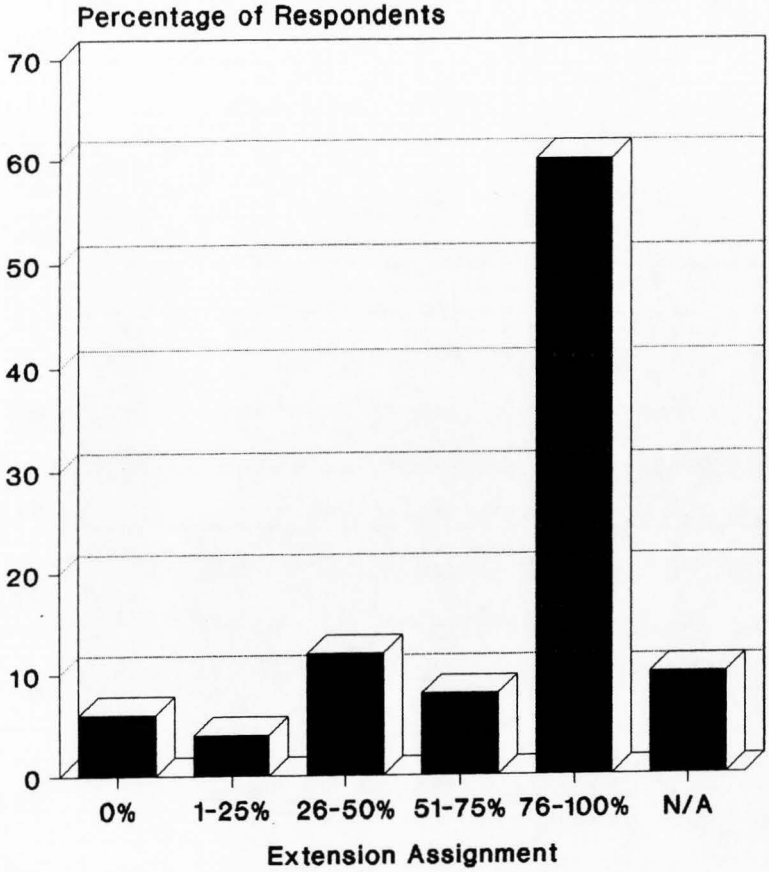

Figure 1. Extension assignments of extension specialist respondents

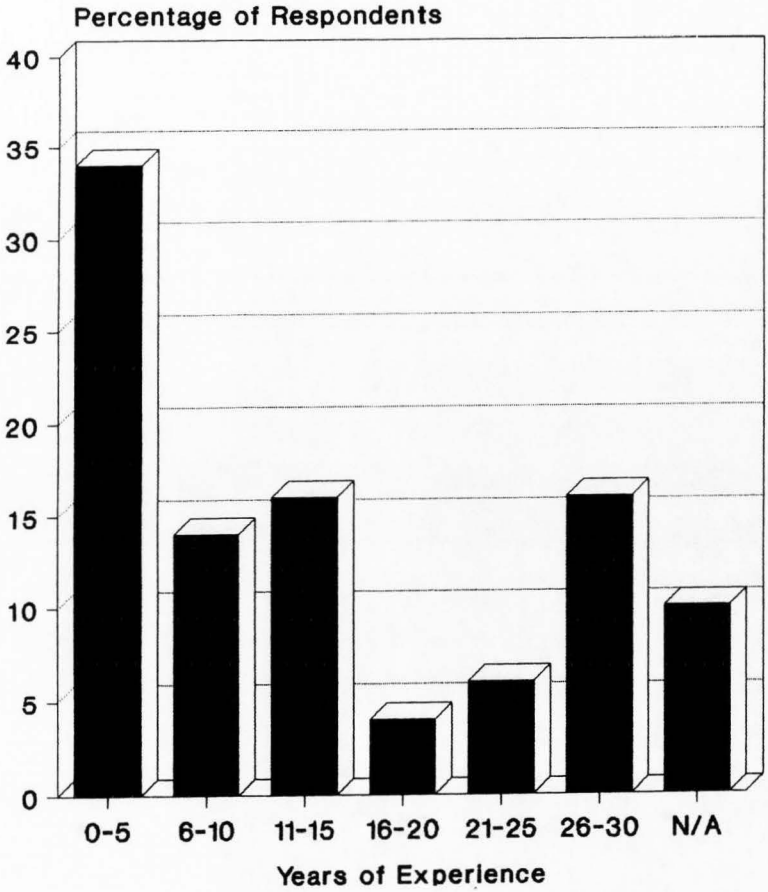

Figure 2. Years of extension experience for extension specialist respondents

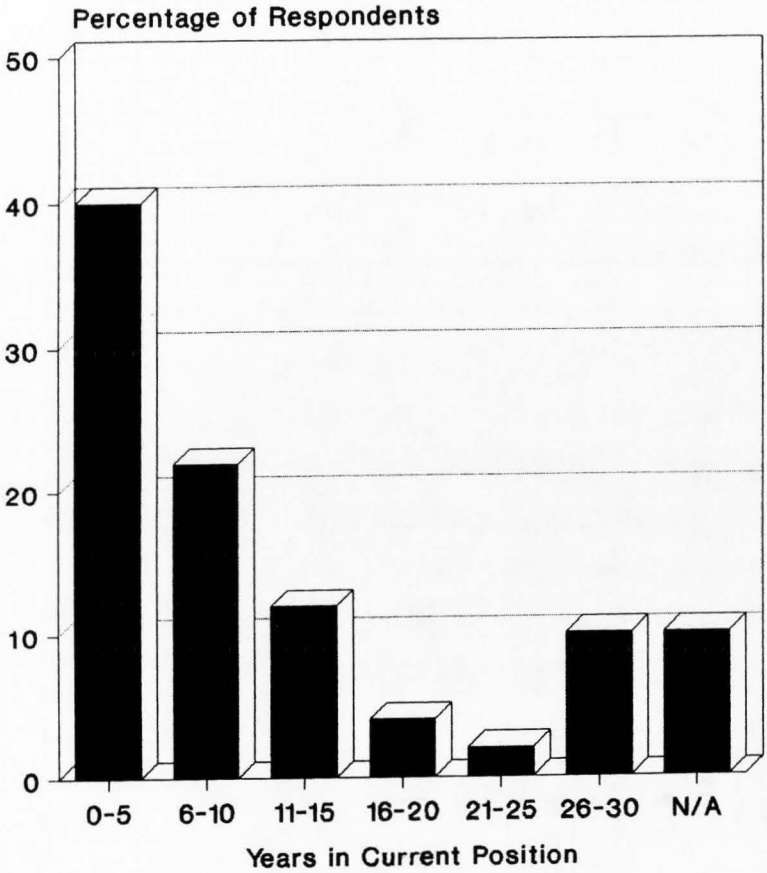

Figure 3. Years in current position for extension specialist respondents

were selected as the best group to measure to analyze the effectiveness of each state's enterprise budget program. This choice was made because the specialist survey revealed the primary source of disseminating budget information is the county agent in most states and also because the cost of developing a national survey of producer use of enterprise budget information was prohibitive.

The county agent survey was conducted by telephone in August and September of 1989 by the researcher and a hired assistant. The researcher held a training session for the assistant and maintained constant communication to ensure uniform procedures throughout the survey. The previously mentioned committee in the Department of Economics at Utah State University also participated in developing this survey instrument. A copy of the county agent survey is included in Appendix A.

A random sample of 100 county agricultural agents was selected for this survey. Since counties in the eastern and southern parts of the United States are smaller and more numerous than in the West, a procedure was developed to insure an unbiased sample. First, the United States was divided into ten geographic regions consisting of the Pacific, Mountain, Northern Plains, Southern Plains, Lake States, Corn Belt, Delta States, Northeast, Appalachian, and Southeast. These regions are depicted in figure 4. Second, using U.S. Department of Agriculture Agricultural Statistics

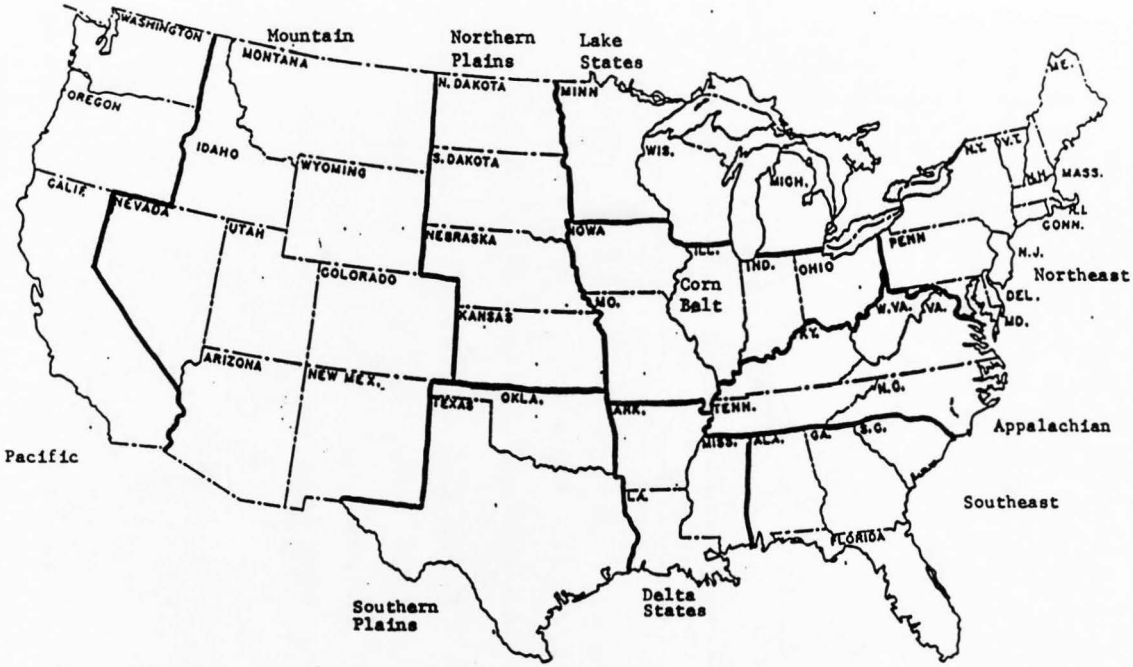

Figure 4. Ten regions of the U.S. for county agent survey

as a reference, the percentage of total farms in the United States located in each region was determined. Third, the number of counties to be included in the sample from each region was assigned proportionally to the percentage of farms. Fourth, a list of the counties in the United States was obtained from the annual reference directory for agricultural extension workers, County Agents, and each county was assigned a number. Fifth, a list of random numbers was generated using Lotus 1-2-3. Sixth, counties whose number corresponded with the random numbers selected were placed in the stratified sample to be surveyed. Finally, when necessary, counties were randomly dropped and added to comply with the stratification requirements for the sample. The location of the counties of the county agents surveyed are listed in table 3 and the geographic distribution of the sample is illustrated in figure 5.

Of the 100 agents surveyed, 30% held a bachelors degree, 65% a masters degree, and 5% a doctorate (figure 6). Those with doctorates held degrees in agronomy, horticulture, plant breeding, soil science, and veterinary medicine. The fields of study for the agents with bachelors and masters degrees are shown in figures 7 and 8 respectively. This information suggests that few agents have had formal training in farm-management and, consequently, the use of budgets in farm-management decisions.

Table 3. Counties that Participated in the County Agent Survey

Crenshaw, AL	Mills, IA	Pontotac, MS	Wayne, PA
Russell, AL	Woodbury, IA	Jefferson, MO	Lee, SC
Cleveland, AR	Bourbon, KS	Macon, MO	Carson, SD
Stone, AK	Greenwood, KS	Maries, MO	Union, SD
Madera, CA	Lyon, KS	Platte, MO	Warren, TN
Merced, CA	Grayson, KY	Teton, MT	Coleman, TX
Salano, CA	Jackson, KY	Boone, NE	Garza, TX
New Haven, CT	Knox, KY	Dundy, NE	Duval, TX
Sussex, DE	Oldham, KY	Taos, NM	Jack, TX
Manatee, FL	Simpson, KY	Chenango, NY	Lubbock, TX
Spalding, GA	Ascension, LA	Niagara, NY	Morris, TX
Upson, GA	Morehouse, LA	Washington,NY	Roberts, TX
Warren, GA	Andvascoggin,ME	Gaston, NC	Rusk, TX
Camas, ID	Franklin, ME	Tyrrell, NC	Swisher, TX
Franklin, IL	Somerset, ME	GoldenValley,ND	Summitt, UT
Lake, IL	Bay, MI	Pembina, ND	Brunswick, VA
Ogle, IL	Chippewa, MI	Rolette, ND	Cumberland, VA
Stephenson, IL	Midland, MI	Hamilton, OH	Lee, VA
Vermilion, IL	Monroe, MI	Jefferson, OH	Grant, WA
Lake, IN	Roscommon, MI	Muskingum, OH	Marion, WV
Miami, IN	Beltrami, MN	Coal, OK	Putnam, WV
Putnam, IN	Freeborn, MN	Latimer, OK	Crawford, WI
Clinton, IA	Otter Tail, MN	Hood River,OR	Dunn, WI
Iowa, IA	Steele, MN	Clearfield,PA	Richland, WI
Jones, IA	Leflore, MS	Fulton, PA	Converse, WY

Figure 5. Geographic distribution of surveyed counties

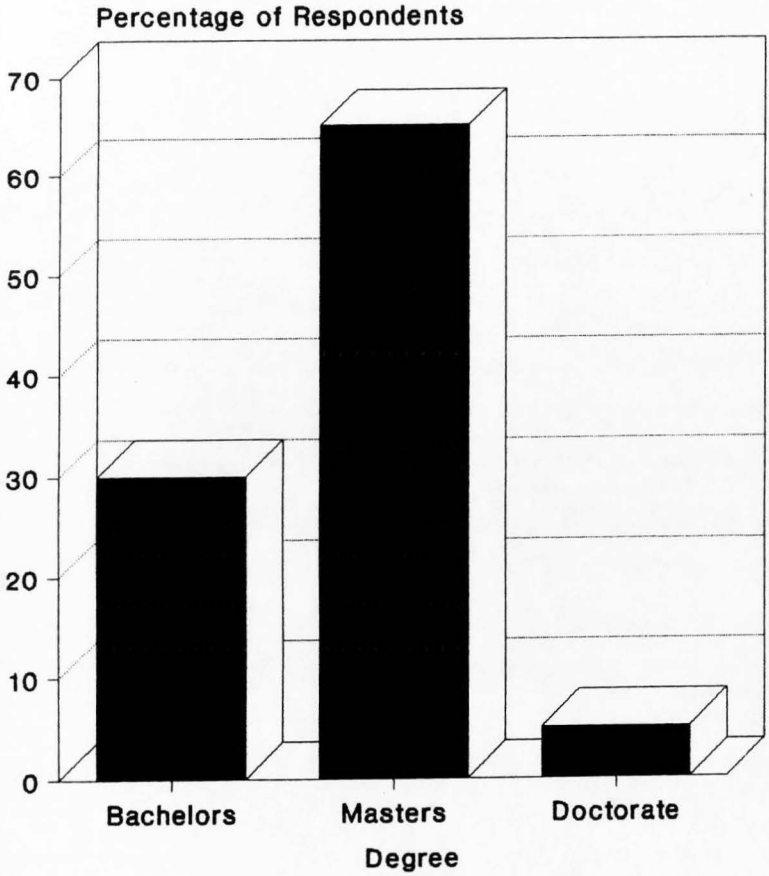

Figure 6. Highest degree held by county agent respondents

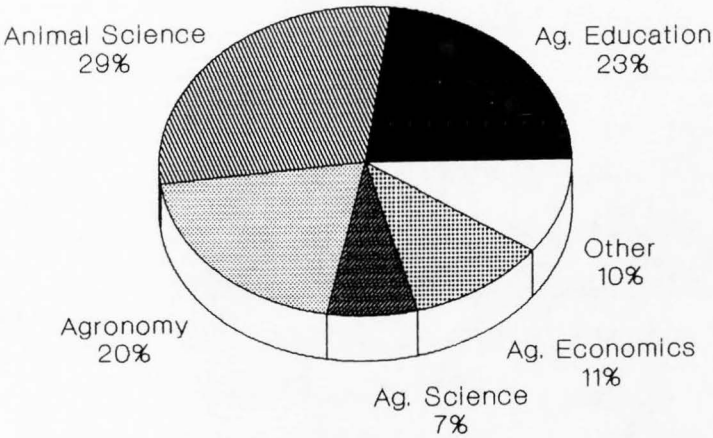

Figure 7. Field of study for county agent's bachelors degree

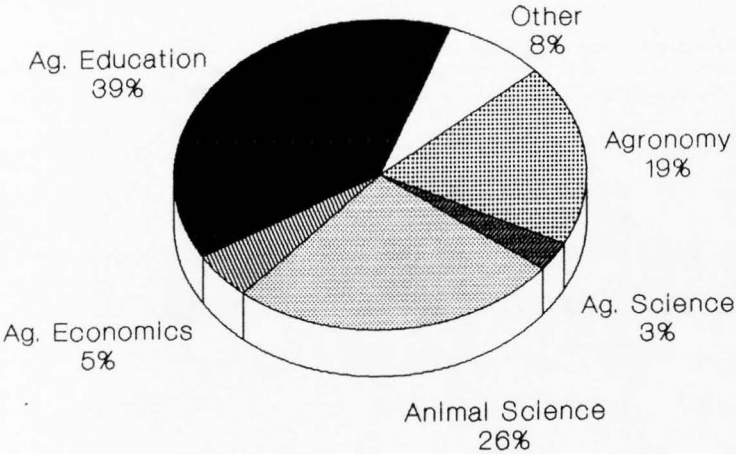

Figure 8. Field of study for county agent's masters degree

Factors that Influence the Use of Budgets

The construction of enterprise budgets for crops and livestock is undertaken by the Cooperative Extension Service in nearly every state. This process includes gathering information relating to the input and output coefficients of various enterprises and the corresponding representative prices, construction of the budgets, publication, and dissemination. This information can be transmitted in several forms including printed material, software, or simply verbal communication from extension personnel to various types of clientele. While a significant amount of resources are devoted to develop enterprise budgets, very little information is available to measure the effectiveness of budget delivery systems.

The very nature of most enterprise budgets published by the state CES's make them oriented to agricultural producers since most budgets deal with costs and returns for producing raw agricultural commodities. As a result, dissemination is largely directed to agricultural producers through county agents. The information can only be passed efficiently if county agents understand the potential use of enterprise budgets as management tools and also understand the assumptions and, hence, the limitations imposed on budget information. For instance, county agents who understand how to use budgets to compare costs and returns for specific

production or marketing alternatives can offer substantial support to producers attempting to maximize profit by optimally allocating resources between and among enterprises. Simple production questions relating to the cost of specific operations such as plowing or planting and other typical input coefficients (e.g., pounds of seeds per acre, calving percentage, etc.) could also be addressed by accurate enterprise budgets (Kay). Much of this information (e.g., input coefficients, yields, etc.) can be acquired by experience that may already reside with the county agent. This indicates that involving county agents in the process of developing enterprise budgets, especially for counties or regions within a state, may be invaluable and may also increase contributing agents' use of budgets. Other factors such as budget updating frequency, the geographic units covered, and the form budgets are distributed in may all affect the agents' use of budgets.

The purpose of this portion of the analysis is to identify the factors determining the level of use of enterprise budget information by county agents. This is accomplished by analyzing data from the survey of extension farm-management specialists and county agents by regression techniques. No other previous study has examined the use of budget information in this manner.

Model

Marketing and production information is available from both public and private sources. For example, USDA publishes vast amounts of information dealing with both current and projected supplies of most major commodities, average prices, utilization, exports and imports, etc. A number of private subscription services provide information on prices and other factors affecting supply and demand (e.g., weather, consumer trends, etc.)

Enterprise budgets compiled by the CES represent another source of public information. They are unique, however, since they itemize average costs and returns for specific alternatives and are actually farm-management tools that can be used in planning, implementing, and controlling a farm business (Olson et al.; Kay; and Boehlje and Eidman).

Stigler has stated that firms will likely invest in information to the point where the "cost of search is equated to its expected marginal return" (p. 175). Consequently, a study of demand for enterprise budget information at the producer level would necessitate estimating producers' production functions to determine the value of the marginal product for enterprise budget information before a conclusion about the efficiency with which producers use enterprise budget information could be reached (Layard and Walters). However, this approach would not address questions about the delivery mechanism for

budget information through county agents, i.e., what determines why one agent uses budget information more than another.

The amount of use of enterprise budget information by county agents is a function of the value of the information to producers since producers are the main source of requests for budget information from county agents. Enterprise budget usage levels are also a result of the efficiency of the county agent in using budget information.

The primary concern of Extension should be to provide accurate and current budget information to interested clientele. However, the county agent becomes a critical link in the delivery mechanism for this information unless producers and other groups approach extension specialists directly for budgets. Since enterprise budget information should be a key element of any farm-management program (Kay), it is important to understand the reasons why county agents have different levels of usage for budgets, since most agricultural county agents work directly with agricultural producers.

The following equation is a simple model to explain the use of enterprise budgets by county agents:

$$(1)\quad Q_B = a \sum_{k=1}^{K} b_k\, CA_k + \sum_{l=1}^{L} c_l\, BC_l + \sum_{j=1}^{J} d_j\, CC_j + e$$

where Q_B is the number of times in one year the county agent estimates he or she directly accesses enterprise budget

information; CA_k is the kth characteristic of the county agent (e.g. age, years as a county agent, highest degree, etc.); BC_l is the lth budget characteristic, and actual serves as a proxy for the quality (value) of the budgets including frequency of updating, specificity of geographic location (state, county, region within the state), use or non-use of producer panels, and distributional form (loose sheets, booklet, software, or combination), and CC_j is the jth characteristic of the county, i.e., the number and size of agricultural production units in the county and the major types of livestock and crops produced. The intercept is represented by a, and b, c, and d are parameter estimates. Data for the variables in equation (1) were obtained through the county agent and specialist surveys and the parameters were estimated by ordinary least squares (OLS). Table 4 presents the explanatory variables used to estimate equation (1).

Data

The county agent survey consisted of questions relating to agricultural production, including which five crop and three livestock activities were the major enterprises in the counties during 1989. These major crop and livestock products were tested to decide if use of budgets by county agents was a function of the most prominent agriculture production enterprise in the county. Crop enterprises were

Table 4. Explanatory Variables Used in Estimating Enterprise Budget Usage Model (Equation(1)).

Agent Characteristics	County Characteristics	Budget Characteristics
1. Understanding of Budget Usage (SCORE)	1. Number of Agricultural Producers (AGPR)	1. Percentage of Major Crops & Livestock Enterprises with Budgets(AVAIL)
2. Graduate Degree (GRAD)[a]	2. Average Dollar Sales Per Farm (SALES)	2. Frequency of Updating (UPDATE)[b]
3. Ag. Econ. Degree (AGECON)[c]	3. Principal Crop:[d] Grain & Oil Seed* Hay & Forage(HAY) Vegetables(VEG) Tree Fruit(TFRUIT) Ornamental Horticulture(FLOWER) (NUTS) Small Fruit (BERRY) (RICE) Tobacco(TOBAC)	3. Use of Producer Panels(PANEL)[e]
4. Agents Involved in Providing Information (PROVIDE)[f]		4. Geographic Units (GEO)[g]
5. Years as a County Agent (YEARS)		5. Distributed in Multiple Forms (MULTIPLE)[h]
		6. Number of Crop Budgets in State (CROP)
	4. Principal Livestock:[d] Beef* (FISH) (DAIRY) (POULTRY) (SWINE)	7. Number of Livestock Budgets in State (STOCK)

[a]Binary variable, 1 if at least one graduate degree is held 0 otherwise.
[b]Binary variable, 1 if budgets are updated at least every two years 0 otherwise.
[c]Binary variable, 1 if at least one degree in agricultural economics is held 0 otherwise.
[d]All binary variables with the base designated by an asterisk.
[e]Binary variable, 1 if producer panels are used to assemble budget information 0 otherwise.
[f]Binary variable, 1 if agent is directly involved in providing information for budget construction to extension specialists 0 otherwise.
[g]Binary variable, 1 if budgets are prepared for geographic units other than the state (county or region) 0 otherwise.
[h]Binary variable, 1 if budgets are distributed in more than one form (booklet, individual sheets, software) 0 otherwise.

grouped by similar production practices such as grain and oil-seed crops, hay and forages, vegetables, tree fruit, flowers and other ornamental horticultural crops, nuts, berries, rice, and tobacco. Livestock enterprises included beef, fish, dairy, poultry, and swine. Certain types of enterprises may lend themselves to more frequent referrals to budget information. For example, crops with high levels of management such as vegetables or berries require very close attention to input levels such as fertilizer and chemicals at several stages in the production process.

Information regarding the number of producers and the value of agricultural sales was obtained through the U.S. Department of Commerce Agricultural Census and established the average size of farms in the county as measured by dollar sales. The size of farms in a county may influence use of budget information by county agents since large commercial farms may construct their own budget estimates while small part-time farmers may not. The survey of county agents also obtained information about the frequency with which budgets were updated, the form in which budgets are distributed (loose sheet, booklet, etc), the geographic units for which budgets were available (state, region, or county), and the number of times the county agent had referred directly to budget information during the previous year (Q_8 in equation (1)).

The agents were also requested to explain their level of involvement in developing enterprise budgets. This included the agents' involvement in providing information, type of information or assistance provided to extension specialists, and whether county agents were included as authors on any budgets.

The county agents were evaluated regarding their understanding of enterprise budget use in management decisions. This was done by requesting the agents to respond to five questions relating to the effectiveness or ineffectiveness of budgets in (1) analyzing break-even prices, (2) price projections, (3) marketing alternatives, (4) production alternatives, and (5) feasibility of different production and/or processing alternatives. Responses were classified as being "correct" or "incorrect" based on the score assigned by the agents on a Likert scale. If the agent answered four or more questions correctly he or she was considered to have a basic understanding of how to use budget information.

Questions about the experience and educational background of the agents (i.e., years as a county agent, highest degree earned, and whether or not at least one degree was in agricultural economics) helped to establish if agents either eventually learn to use budgets over time or if use was mainly determined by the type of formal education the agent had received.

The specialist survey ascertained whether budgets were distributed in one or multiple forms (i.e. single sheets, software, etc.) and also determined how many crop and livestock budgets were being constructed annually in each state. This information revealed whether or not the sheer number of budgets available and the flexibility of their use influenced county agents to refer to them more.

Results of the county agent survey, extension specialist survey, and regression analysis are reported in the next chapter.

CHAPTER IV

RESULTS

Budgeting can be described as the selection of potential enterprises, gathering the necessary data to describe these enterprises, calculating the costs and returns associated with an enterprise, and compiling the results into meaningful reports (Olson et al). These reports are then used by agricultural producers and other professionals in planning and decision making. But just how effective are the various methods used to construct and distribute enterprise budgets? An attempt is made in this chapter to answer this question by presenting the results of the two surveys and regression analysis presented in Chapter III. The following section reports the results of the extension specialist survey.

Results of the Extension Specialist Survey

The extension specialist survey consisted of 21 questions concentrating on the procedure used to develop enterprise budgets. The responses to all survey questions were first individually examined to establish variable frequencies and the resulting probability distribution function (pdf). Collectively, the questions represent the distribution of methods used to construct enterprise budgets across the states. This basic statistical analysis was

preformed using a computerized package called Statistical Analysis System (SAS).

When this survey was administered, four state land-grant universities (Montana, Hawaii, Vermont, and Rhode Island) were not publishing enterprise budgets. Therefore, the statistics in this section are based on the remaining 46 states that develop and distribute enterprise budgets.

Responses to Questions Relating to Funding

Preparing enterprise budgets requires considerable time, effort, and money. State agencies or land-grant universities provide most state funding for budget development. The Extension Service provides at least partial funding in 76% of the 46 states (figure 9). In fact, the extension specialist survey revealed that the Extension Service provides 100% of the funding for enterprise budget development in 48% of the states and between 67 and 99% of the funding in an additional 20% of the states. However, nearly a quarter of the states surveyed received no funding for budget development from the Extension Service. The fact that Extension provides a majority of these funds is probably indicative of the very applied nature of the research needed to construct budgets and the subsequent use of the budgets in extension programs. However, budget information is often used in other basic and applied research to estimate production costs. This would

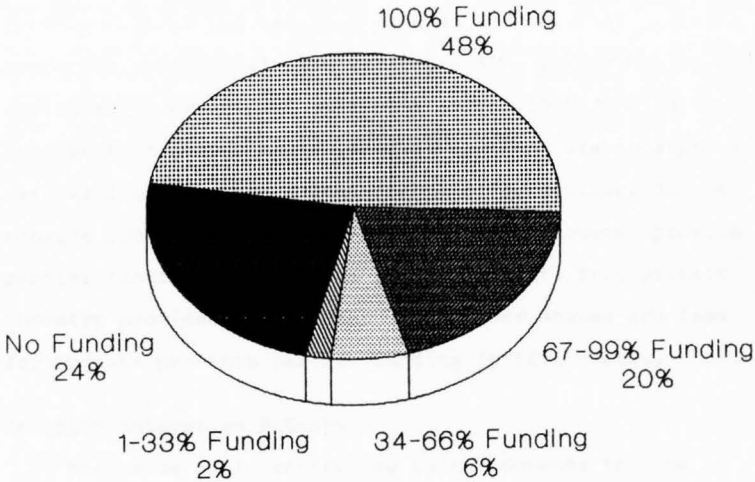

Figure 9. Budget funding by Extension (percent of states)

tend to legitimize the funding support of budget construction by research entities.

Other sources of funding for developing enterprise budgets include university agricultural economics departments, state agricultural experiment stations, state departments of agriculture, grants from private industry, and fees. Agricultural economics departments in six states (Florida, Georgia, Indiana, Michigan, Nevada, New Jersey) provide 100% of the required funding and at least partial support in another six states (table 5). In New Mexico, the agricultural experiment station provides 100% funding; in another four states agricultural experiment stations provide partial funding. State departments of agriculture do not provide 100% funding in any state, they do however provide partial funding in one state (Utah). Grants from private industry provided partial funding in four states and fees for budgets provides partial funding in five states.

Revising Enterprise Budgets

The value of an enterprise budget depends to some degree on the frequency with which the budget is updated. According to the surveyed extension specialists, 70% of the budgets they prepare are updated each year, 11% are prepared on alternate years, 7% every third year, 9% every fourth year, and just 3% of the states update budgets as needed (figure 10). As in the Oregon example described in Chapter III of this thesis, one reasons some budgets are updated

Table 5. Source of Funding for Enterprise Budget Development and Corresponding Number of States[a]

Source	100% Funding	Partial Support	No Support
Extension	22	13	11
Agricultural Economics Departments	6	6	34
Agricultural Experiment Stations	1	4	41
Grants from private industry	0	4	42
Fees	0	5	41
State Department of Agriculture	0	1	45

[a]Data for 46 states

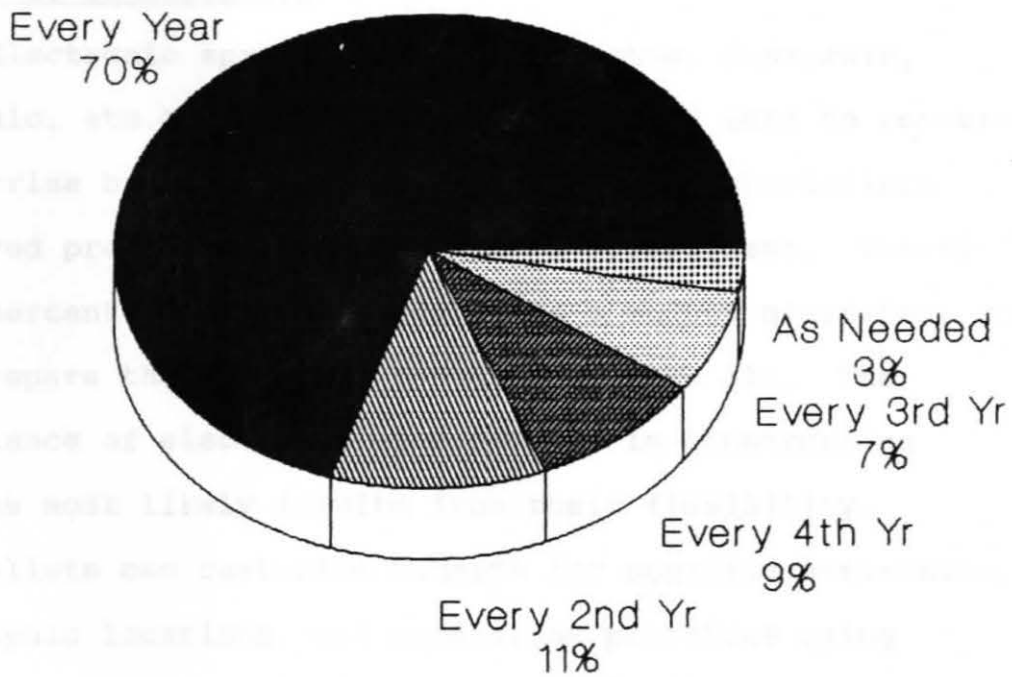

Figure 10. Frequency with which budgets are updated

less frequently is that many are being prepared on a three or four year rotation basis.

Since 70% of the states update budgets every year it appears that most states make a major effort to keep their enterprise budgets current. This gives some indication of the importance that is being placed on the use of enterprise budgets.

Method of Construction

Electronic spreadsheets (e.g., Lotus, Supercalc, Visicalc, etc.) are the most common method used to construct enterprise budgets. Half of the extension specialists surveyed prepare their budgets on a spreadsheet. Thirty-nine percent of the specialists use a budget generator, and 11% prepare their budgets manually (figure 11). The acceptance of electronic spreadsheets in constructing budgets most likely results from their flexibility. Specialists can customize budgets for specific situations, geographic locations, and production practices using spreadsheets while budget generators use a more rigid format.

Some budget generators still being used include the Microcomputer Budget Management System developed at Texas A&M University, the Oklahoma Budget Generator, and the Mississippi State Budget Generator. However, budget generator usage appears to be declining as the popularity of electronic spreadsheets increase. Rapid changes are

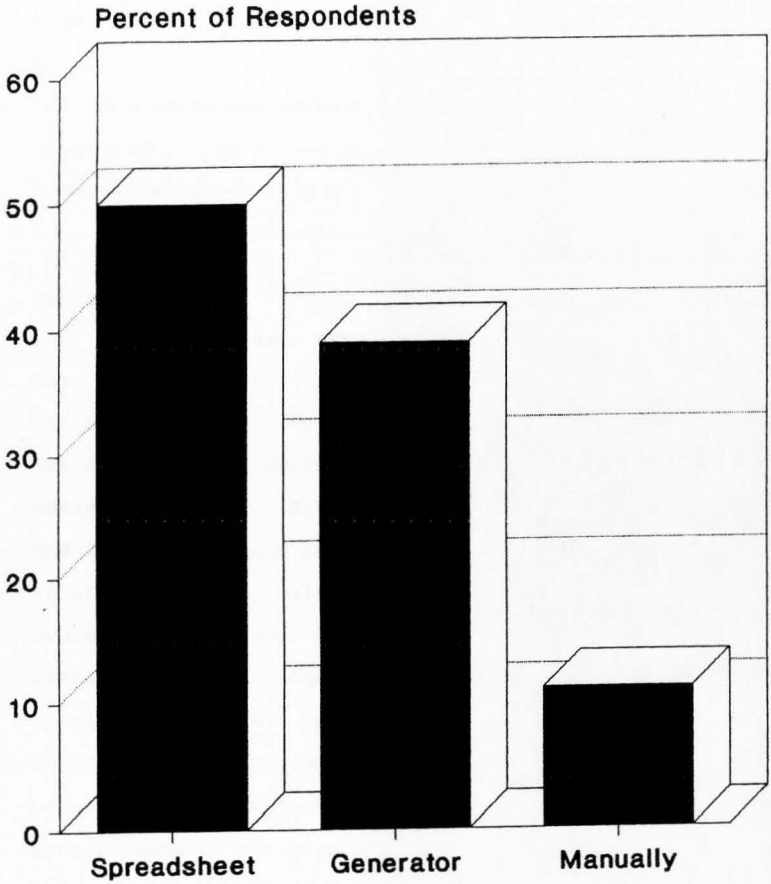

Figure 11. Method of budget construction

occurring relating to the types of considerations needed to construct useful budgets. For example, budgets must consider environmental concerns, tillage methods, alternative crops, soil type, specialized machinery, different irrigation systems, etc. This increases the need for more localized budgets and requires substantial flexibility. As a result, the old generation of budget generators will likely soon be replaced by spreadsheets or by a newer, more flexible generation of budget generators.

Geographic Area

Respondents were asked what geographic basis budgets were constructed for in their state. Responses showed that 56% of budgets were constructed mainly on a statewide basis, 42% on a regional basis within the state, and 2% on a county basis (figure 12). Sixteen states prepare enterprise budgets on more than one geographic basis. Three of these 16 states (Alaska, California, New Mexico) base their budgets on a regional and county basis; the remaining 13 states base their budgets on a state and regional basis. Specialists from six of the 13 states that prepare budgets on both a state and regional basis mentioned that they prepare their livestock budgets on a state basis and their crop budgets on a regional basis.

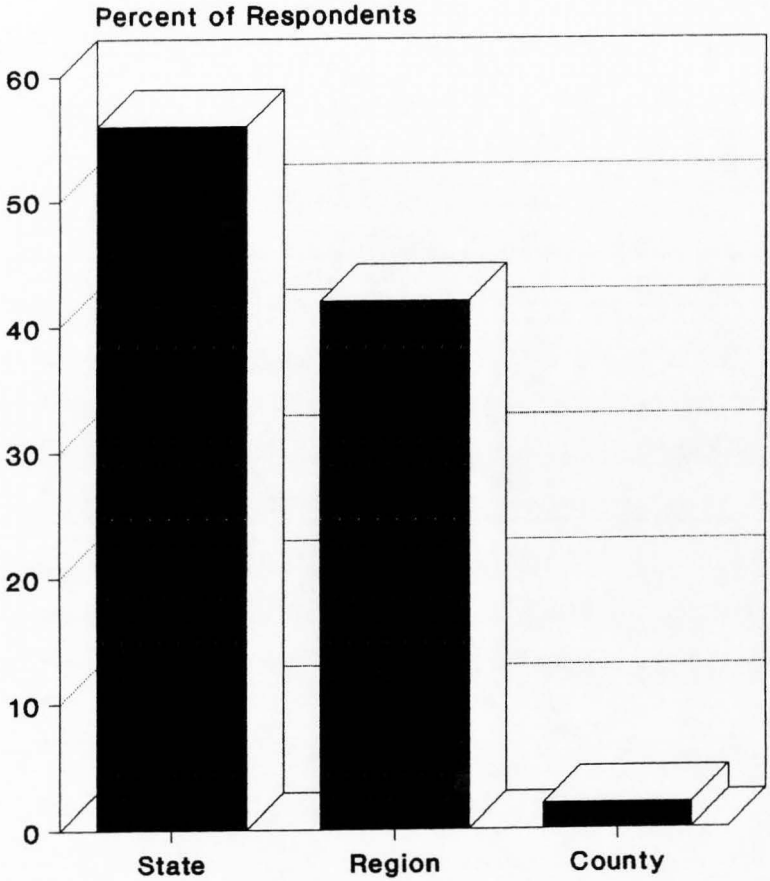

Figure 12. Geographic basis of budgets

Distributional Form

Enterprise budgets are published and distributed by several different methods including individual sheets, in a book or manual, as computer software, or in newsletters. In addition, an increasing number of states are transmitting budgets by electronic mail. Results of the extension specialist survey show that 49% of the specialists publish and distribute the majority of their budgets in some form of book (figure 13). Twenty-nine percent of the specialists choose to publish and distribute their budgets as individual sheets. Computer software is the form used by 14%, and 8% use some other form. Of the 46 states that publish budgets, 13 publish and distribute their budgets in two forms, and three states (Alabama, Iowa, Louisiana) use at least three forms.

Collections of budgets on leaflets bound in three ring binders is a popular filing method for budgets distributed on individual sheets. Farm-management manuals, extension bulletins, booklets of budgets, and budget handbooks are examples of common book forms in which budgets are published and distributed.

Sources of Information

Several types of information are necessary to develop an enterprise budget, including yields, output prices, by-products, input coefficients and input prices. The revenue section of a budget consists mainly of price/output

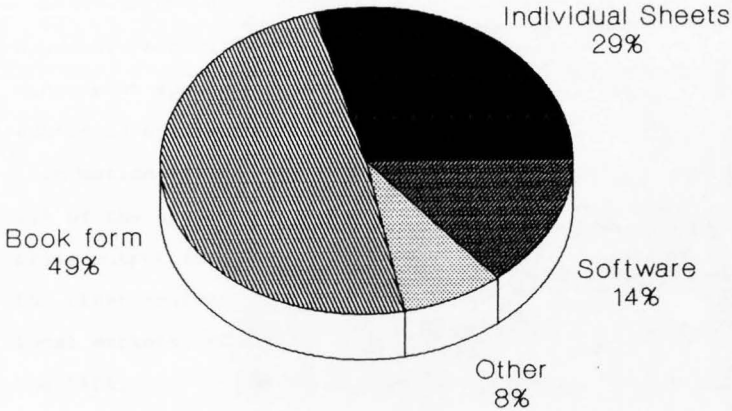

Figure 13. Form in which budgets are published and distributed

information. This type of information includes yields, products and by-products, and expected prices for the commodity. Input coefficients and costs determine the variable and fixed costs associated with producing the enterprise. All expenses associated with production of a enterprise (e.g. fuel, seed, labor, medical supplies, fertilizer, depreciation, taxes, and machinery) are considered input information.

Price/output information is obtained from numerous sources. According to the survey, 30% of the farm management specialists that prepare budgets rely on other extension specialists as their main source of price/output information (figure 14). Forecasts are the main source for 19% of the specialists and 16% get most of their price/output information directly from producers. Some of the other sources used to obtain this information include local markets, state reporting services, county agents, and the USDA.

Some of the sources of price/output information are also sources of input information. For example, 20% of the farm-management specialists surveyed also rely on other extension specialists as their main source of input information. Another 20% get most of their input information from producers and 11% from county agents (figure 15). Suppliers and university agronomy departments are two other sources of input information, suppliers

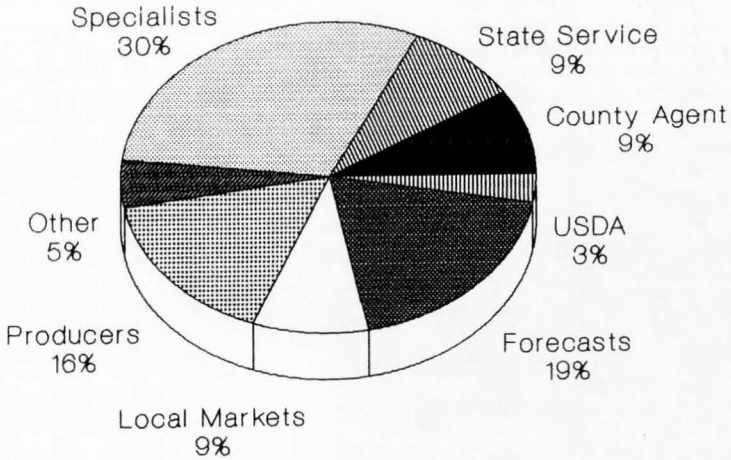

Figure 14. Sources of price/output information

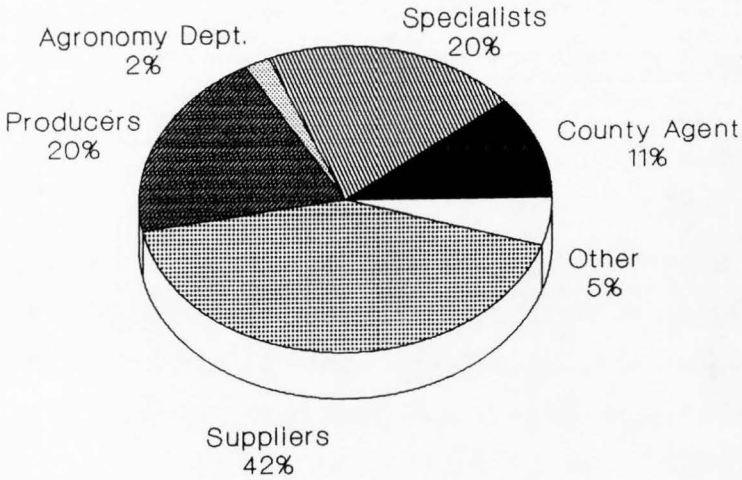

Figure 15. Sources of input information

provide information for 42% of the specialists and agronomy departments 2%.

Producer Panels and County Agents

As mentioned in Chapter III, producer panels and other face-to-face contacts are the preferred methods of obtaining information. Producer panels add to the cost of developing enterprise budgets, both in terms of time and resources. Forty-two percent of the specialists surveyed use producer panels, while the remaining 58% do not. Those using producer panels were asked to rate the level of involvement of producers in the budget development process. Forty-two percent of the specialists using producer panels reported a high level of involvement for the panels, 37% a moderate level of involvement, and 21% a low level of involvement. This suggests that those specialists using producer panels have confidence in the information the panels provide.

County agricultural agents can be another valuable source of help and information needed for preparing enterprise budgets. In addition to providing both price/output and input information, agents are also able to provide insight into production practices. Some specialists even arrange their producer panels through county agents. The extension specialist survey showed that 64% of the specialists involve county agents in the construction of enterprise budgets. As in the case of those who used producer panels, the specialists who involve county agents

were asked to rate the level of involvement of the agents. Forty-five percent rated the agents level of involvement high, 14% rated it moderate, and 41% rated it low. When the specialists who involve county agents were asked if the agents have ever received any direct training concerning gathering information for enterprise budgets, 37% or 11 of the 29 said yes.

Authorship of Budgets

Even though 64% of the specialists surveyed involve county agents in the development of enterprise budgets, only 22% of the specialists include the agents as authors on the budgets (figure 16). Fifty-three percent of the specialists reported being the sole author of the budgets they produce. Everyone involved in the development of the budget is included in the authorship by 23% of the specialists, and 2% said that no author is listed on the budgets.

Resources Devoted to Budgets

The amount of time spent preparing enterprise budgets by each state ranges from .05 to 5.5 full time equivalents (FTEs). The average time spent is .91 FTE with a standard error of .16 and a standard deviation of 1.09. As shown in figure 17, 61% of the states expend less than .5 of a FTE preparing enterprise budgets, 11% between .6 and 1 FTE, 9% between 1.1 and 1.5, 7% between 1.6 and 2, 5% between 2.1 and 2.5, 2% between 2.6 and 3, and 5% spend more than 3

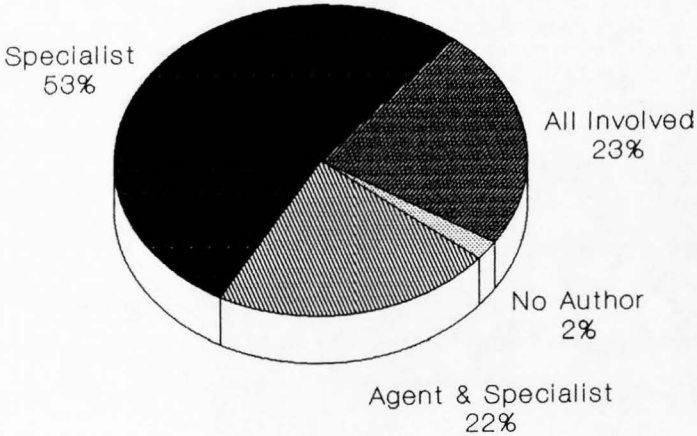

Figure 16. Authorship of budgets

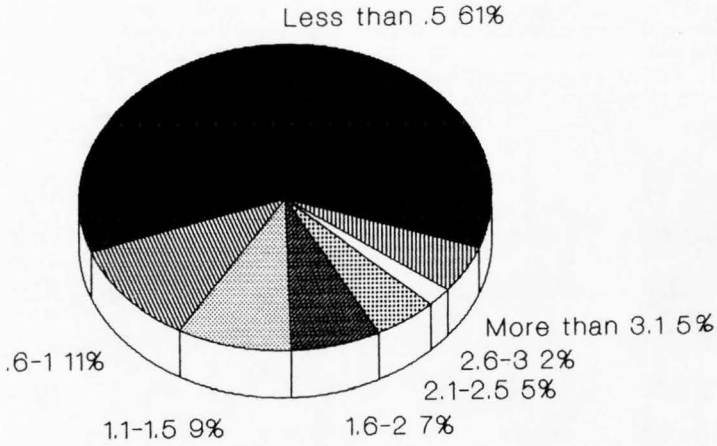

Figure 17. Full-time equivalents engaged in constructing budgets

FTEs.

The extension specialists who responded to the survey were also asked if they felt that the amount of resources devoted to budget construction in their state, should remain the same, be increased, or be decreased. Nearly half (48%) felt that the amount of resources their state devotes to budget construction should remain the same (figure 18). Thirty-seven percent wanted more resources devoted to enterprise budgets and 15% wanted less. The states represented by 11 of the 17 specialists who wanted more resources devoted to budget construction are spending .6 FTEs or less on their budgets. This suggests states with small amounts of resources devoted to constructing budgets see budgets as a priority where additional resources should be directed. These results also indicate a general satisfaction with the resources being devoted to constructing budgets in states with over .6 FTEs designated for that purpose.

Requests for Budgets

Understanding the clientele who will use enterprise budgets and the purpose for which they are used should influence how budgets are prepared. To gain a broader perspective of potential uses for enterprise budgets, the extension specialists were asked what types of clientele constituted the majority of requests for budget information. Agricultural producers request the most budget information,

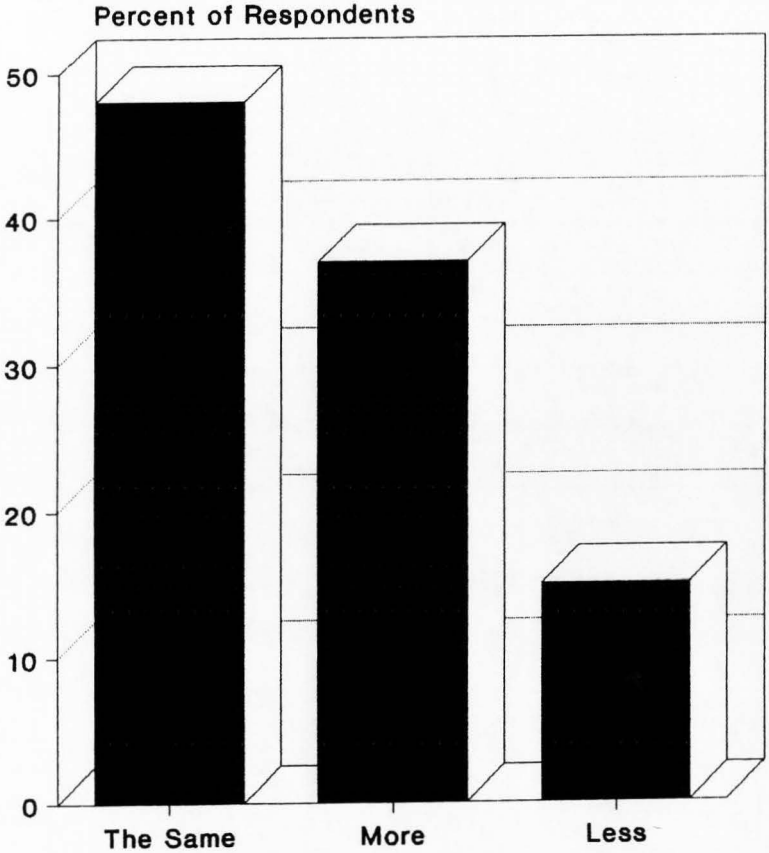

Figure 18. Resources devoted to budgets (specialists)

with 48% of the extension specialists saying that group is the major source of requests (figure 19). County agents are the main source of requests for 31% of the specialists and financial organizations request the most budgets from another 15%. The specialists also reported receiving requests for budgets from potential agricultural producers, lawyers, state and federal government agencies, appraisers, consultants, agribusiness, and researchers.

Results of the County Agent Survey

The county agent survey consisted of 22 questions concentrating on the demand for, and use of, enterprise budgets. While county agents represent only one group of many using enterprise budget information, they represent a critical link between the extension specialists and his or her clientele groups. Nearly all states disseminate enterprise budget information to the county offices. Understanding the use of this information once it arrives at the county office is essential if an efficient link is to be forged between the specialists and clientele at the county level who demand this information. The county agent represents this link, and this study analyzes how well county agents use the budget information they are provided.

All 100 of the county agricultural agents contacted agreed to respond to the survey. Thus, the statistics in

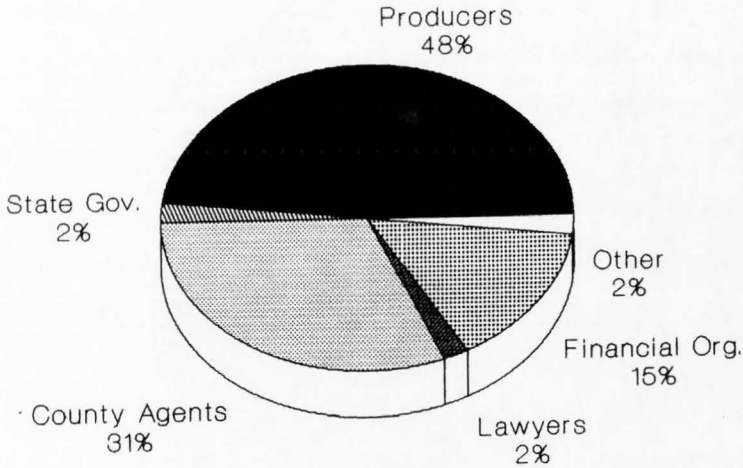

Figure 19. Main source of budget requests for extension specialists

this section are based on the responses of all 100 agents. Only one county was selected from the four states whose land-grant universities do not currently publish enterprise budgets. The agent from this county mentioned that the budgets he was using were updated over five years ago.

Use of Enterprise Budgets

Ninety-five percent of the county agents surveyed use enterprise budgets in one way or another. Some agents reported using budgets quite extensively. In fact, 5% of the agents mentioned that they have referred to enterprise budgets over 200 hundred times in the past year (figure 20). Another 13% reported referring to a budget between 101 and 200 times, 19% between 50 and 100 times, and 63% less than 50 times during the past year. Enterprise budgets are frequently relied upon and appear to be highly useful to today's agricultural agents. As mentioned in Chapter III, enterprise budgets are among the most valuable management tools used by agricultural managers. This concept is reinforced by the wide use of enterprise budgets as tools for county agents.

Revision of Budgets

Budgets being used by a majority of the agents surveyed are quite current. Seventy-six percent of the agents reported that their budgets have been updated within the last year (figure 21). Fourteen percent reported that their

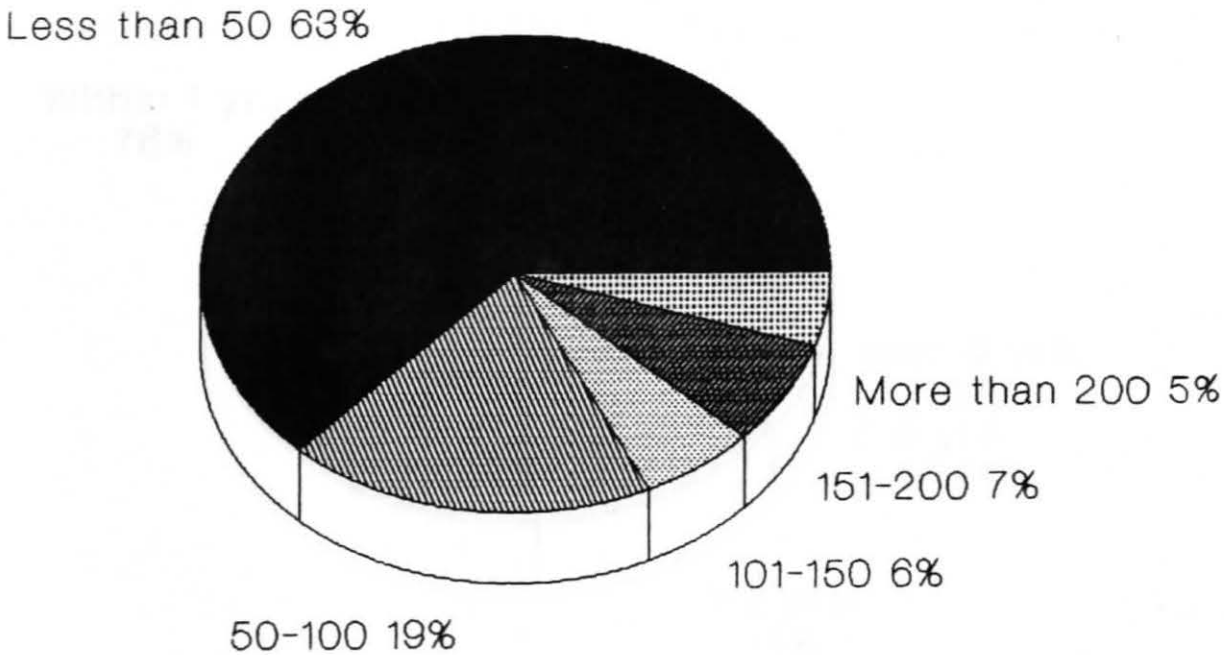

Figure 20. Use of enterprise budgets by county agents

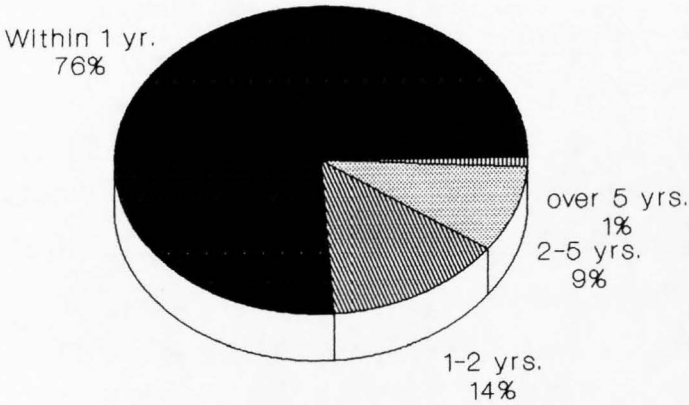

Figure 21. Frequency of budget updating

budgets were updated 1 to 2 years ago, 9% 2 to 5 years ago, and only 1% over 5 years ago. These statistical results, from a stratified random sample of 100 agents, are amazingly close to those of the extension specialists (compare figures 10 and 21). This indicates that the agents surveyed are well aware of when the budgets were last updated.

Preferred Form of Budgets

Nearly half (49%) of the states that construct enterprise budgets publish and distribute them in booklet form. Yet, according to the county agent survey, individual sheets are the form in which the majority of agents (40%) prefer to receive budgets (figure 22). Additional results of the survey indicate that 33% of the agents favor some form of a book, 25% would prefer receiving budgets as software, and 2% like some other form (such as newsletters).

A large number of the agents mentioned that they use enterprise budgets when they meet with individual producers, and nearly all the agents reported that they distribute budgets from their offices. Some of the reasons agents gave for preferring budgets on individual sheets were (1) producers are usually interested in just one or two enterprises, and individual budgets facilitate distributing budgets only for the enterprises they are concerned with, (2) budgets are requested more frequently for some enterprises than they are for others, and (3) changes can be made on individual budgets more economically than on budgets

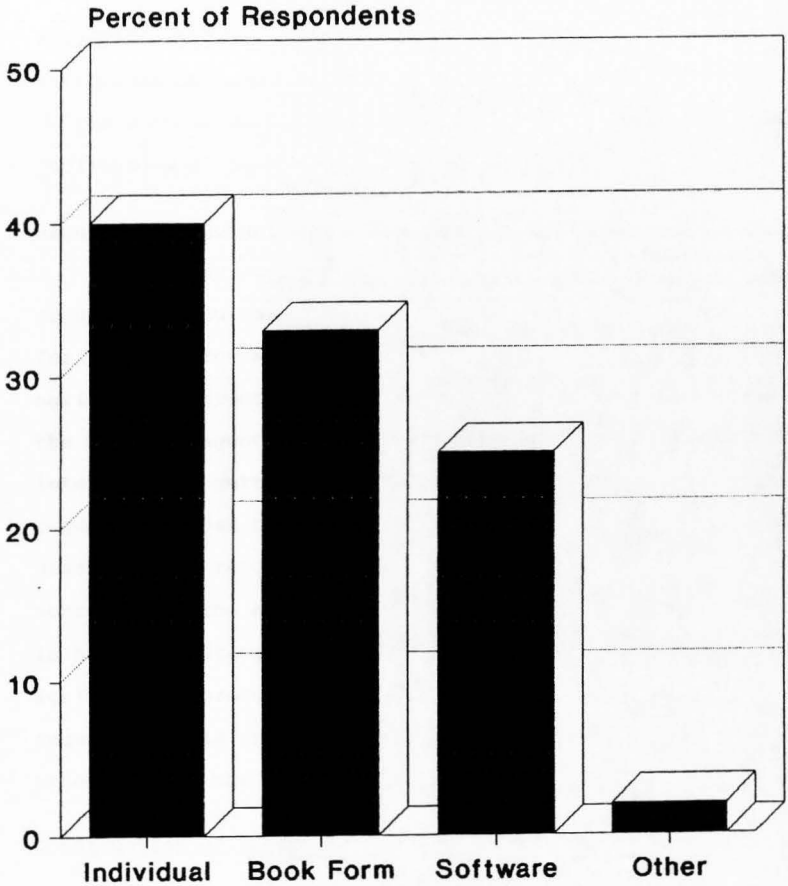

Figure 22. Preferred form of budgets

in a book. Some of the agents who prefer budgets as software mentioned that they like being able to change the budget as they work with a producer, they also like being able to print budgets as they are needed or requested. Regardless of the reasons, agents preferred to receive enterprise budgets in more than one form. The consequences of the form or forms in which enterprise budgets are published will be discussed later in this chapter.

Requests for Budgets

The county agents were also asked which clientele groups constituted the majority of the requests they receive for budget information. Figure 23 illustrates that agricultural producers request the most budgets form 83% of the surveyed agents. Potential producers or parties interested in getting involved in agricultural production request the most budgets form 9% of the agents. Financial organizations request the most budgets from 4%, and other sources make the most requests to another 4% of the agents. In both the extension specialist and county agent surveys, agricultural producers were the primary source of budget requests. This is a good indication that agricultural producers are the largest users of enterprise budgets.

Construction of Budgets

Farm-management specialists from the state land-grant universities are responsible for preparing the budgets used

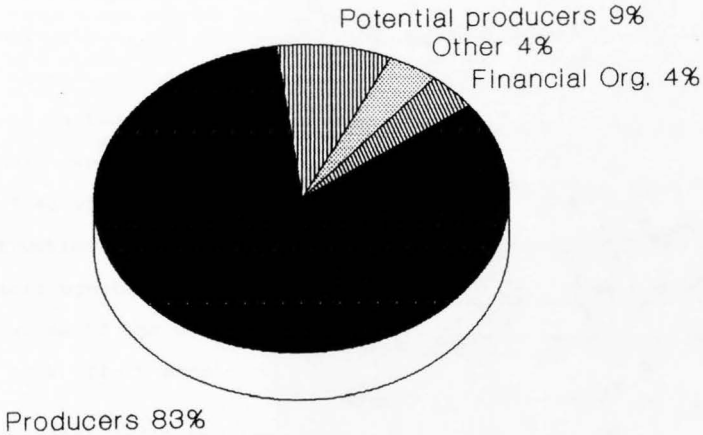

Figure 23. Main source of budget requests made to county agents

by 83% of the surveyed agents (figure 24). Eight percent of the county agents surveyed said that they share the responsibility with the specialists, and another 8% mentioned that area agents prepare the budgets in their state.

Resources Devoted to Budgets

When asked if they felt that more, less, or the same amount of resources should be devoted to budget construction in their state, 53% of the agents responded by saying the same amount, 46% felt that more resources were needed, and only 1% wanted less(figure 25). As in the case of the extension specialists, a majority of the agents are satisfied with the amount of resources being put into the construction of their state's enterprise budgets. Still, far more agents and specialists feel that more effort should be devoted to the development of their budgets than feel that less effort should be devoted.

Factors that Influence the Use of Budgets

This section reports the results of the regression analysis. The ordinary least squares parameter estimates for equation (1) are presented in table 6. The relatively low usage level of enterprise budgets by county agents cannot be explained by this model. However, several important conclusions can be drawn from the results of the regression analysis.

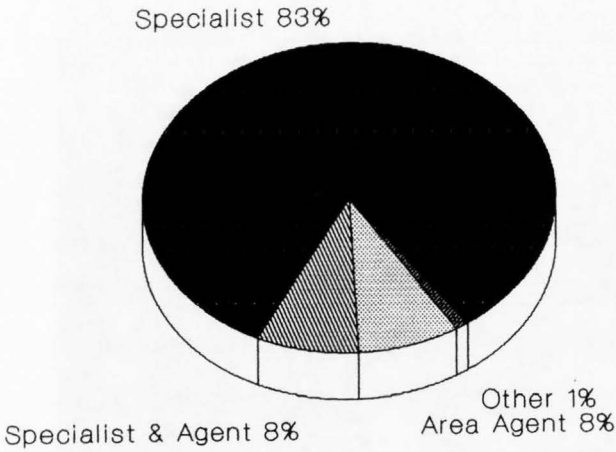

Figure 24. Who constructs your state's enterprise budgets

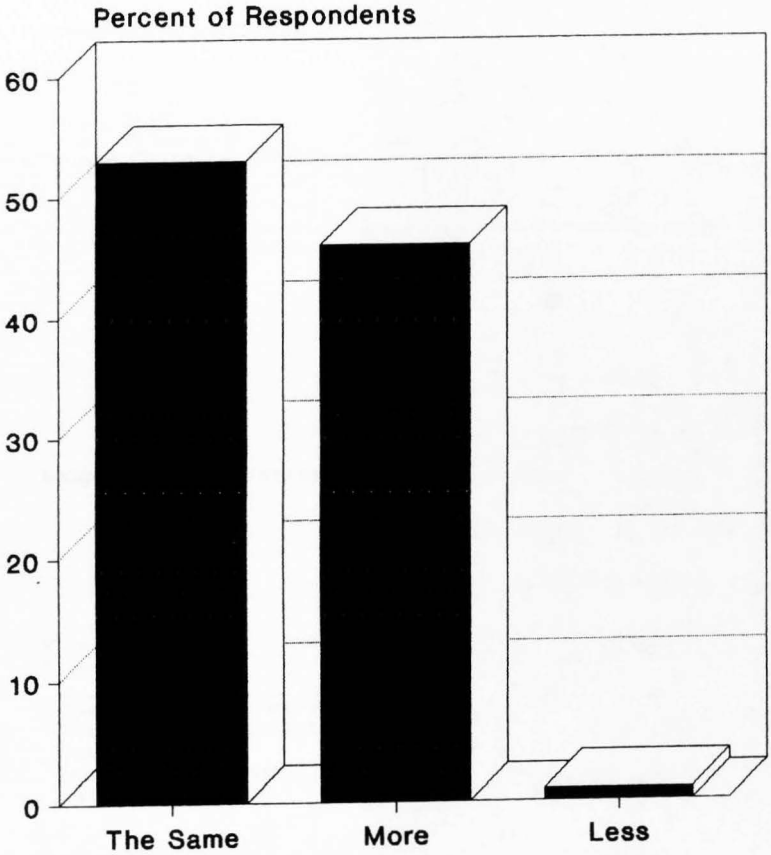

Figure 25. Resources devoted to budgets (agents)

Table 6. Parameter Estimates for Model of County Agent Use of Enterprise Budgets (Equation (1)).[a]

	Independent Variable	Parameter Estimate	t Value
Intercept		-221.55	-3.14**
Agent Characteristics:	SCORE	25.041	2.960**
	GRAD	-22.181	-1.135
	AGECON	19.247	0.809
	PROVIDE	52.957	2.877**
	YEARS	0.440	0.512
County Characteristics:	AGPR	0.072	3.065**
	SALES	0.169	1.492
	HAY	50.356	1.636*
	VEG	48.495	0.602
	TFRUIT	37.843	0.775
	FLOWER	82.989	1.893*
	NUTS	-20.016	-0.377
	BERRY	155.790	1.873*
	RICE	-153.867	-2.013**
	TOBAC	53.235	1.927*
	FISH	140.394	1.871*
	DAIRY	-7.184	-0.297
	POULTRY	9.420	0.274
	SWINE	20.562	0.520
Budget Characteristics:	AVAIL	25.728	0.868
	UPDATE	22.229	0.512
	PANEL	23.808	0.788
	GEO	53.384	2.327**
	MULTIPLE	49.449	2.454**
	CROP	-0.462	-3.597**
	STOCK	1.840	2.809**

R^2 = .542
F = 2.628**

[a] See table 1 for variable definitions.
* Denotes statistically different than zero at the 10% level.
**Denotes statistically different than zero at the 5% level.

Characteristics most likely to influence county agents' use of enterprise budgets were the agent's level of understanding concerning budgets (SCORE) and the involvement of the agent in providing information to specialists for published budgets (PROVIDE). This suggests that county agents will only use budget information if they understand how to use budgets (i.e., they need to be trained in management decisions). It also suggests that agents are more likely to use the information if they are part of the process of gathering it. In general, if agents understand when using budget information would be helpful, and have confidence in the numbers used in the budgets (prices, input, coefficients, etc.) their use of budgets will increase. This appears to be true regardless of the agent's length of service (YEARS) or his or her educational background (GRAD and AGECON).

County characteristics also play an important role in determining the level of usage of budgets by county agents. For example, the number of agricultural producers in a county (AGPR) has a significant impact on the employment of budgets by its agents. This may be indicative not only of a larger agricultural clientele in the county but also possibly a more significant orientation toward agricultural programs. The size of farms in the county (SALES) does not appear to have a significant impact on the county agents' use of budgets.

The principal types of crops and livestock in the county influence the use of budgets. It appears that high management crops, highly perishable crops, and livestock enterprises tend to require the use of more budget information. This is shown by the significant parameter estimates for ornamental horticultural crops (FLOWER), small fruit (BERRY), tobacco (TOBAC), and fish (FISH).

These results suggest that the use of enterprise budgets may change over time as a crop becomes more familiar. That is, interest may grow for information about non-traditional enterprises but will level off once an enterprise's costs and returns become more generally known. This implies that those who construct budgets should engage at least part of their efforts in constructing budgets for emerging enterprises types.

The parameter estimates for the budget characteristics indicate that producing enterprise budgets for specific counties or regions within a state (GEO) and distributing these budgets in multiple forms (MULTIPLE) will increase their use by county agents. The more site-specific and flexible the provided information, the higher its accuracy and usefulness will be.

The percentage of budgets available for major crop and livestock enterprises in the county (AVAIL) was not a significant determinant of usage and suggests that agents are being provided adequate budget information for most

major enterprises, on the average. Other reasons are more important determinants of usage than simple non-availability. Furthermore, the frequency with which budgets are updated (UPDATE) did not significantly impact the agents' use of the budgets. This implies that agents who use budgets continue to refer to them even when they are somewhat dated. Agents may be making their own modifications to the budgets (e.g., updating prices).

The total number of crop (CROP) and livestock (STOCK) budgets published by a state also influences their use. As the number of crop budgets published increases use decreases slightly. The opposite is true for livestock enterprises, where use increases with the number of livestock budgets published. This may indicate that some mis-allocation of resources between crop and livestock budgets is occurring. For instance, the results suggest that interest of county agents in crop budgets may be in the area of more non-traditional types of enterprises (table 6). If interest wanes for budget information as a crop becomes more well known then simply proliferating budgets will not increase their use by county agents. Most states emphasize crop budgets, as would be expected, since a larger variety of crops exist than livestock enterprises. However, some shifting of resources to more livestock budgets will probably increase overall usage.

These results imply that county agents will use budget information if they are trained regarding the value of the information and the budgets are distributed in a form desired by the agent. Furthermore, basing the budgets on smaller geographic areas will increase the agents use of budgets. These results also justify some shifting of resources away from traditional crop budgets to non-traditional and livestock budgets.

CHAPTER V

SUMMARY AND CONCLUSIONS

Management skills and knowledge have become as much a part of agriculture as crops and livestock. Budgets developed for crop and livestock enterprises are valuable management tools. They provide information that is essential to todays agricultural managers. This thesis investigated the various methods used to develop enterprise budgets, the use of enterprise budgets, and identified factors that influence the use of budgets by county agricultural agents and ultimately agricultural managers.

Research concerning the various methods used to construct enterprise budgets was initiated by surveying the extension specialist responsible for budget construction in each of the 50 states. A second survey, of county agricultural agents, was used in determining the use of enterprise budgets. The format used to present the results of the two surveys lists the various responses and identifies the most prevalent. Responses from both surveys were used in a regression analysis to determine the factors that influence the use of enterprise budgets by county agents.

In general, the state extension services appear to be providing an adequate number of budgets to county agents. However, the agents may not be trained well enough in using

the budgets to optimize benefits from the information. Those county agents involved in providing information to extension specialists for budgets are the ones most likely to use the budget regularly. Some states may wish to reconsider the allocation of resources for budget construction since the growth areas for budget information appear to be for non-traditional crops and livestock enterprises rather than for crops in general.

A significant challenge is faced when the CES provides a basic set of budgets to county agents, but the information is too general to entice the agent to use it often in his or her county. A significant reallocation of resources may be needed at the state level for more site-specific budgets and/or more non-traditional crop budgets. Also, expanding efforts by agents in providing site-specific information for budgets, or even in constructing their own budgets for their county, would likely increase the level of usage by county agents.

Recommendations

The following recommendations are offered to The Department of Economics at Utah State University to assist in the preparation of enterprise budgets.

1. Involve county agricultural agents in the development of enterprise budgets whenever possible. As previously mentioned, results of the regression analysis indicate

that county agents who participate in the development of enterprise budgets are more likely to use them.

2. Develop budgets for a specific geographic region, district, or county. Site-specific or localized budgets increase the accuracy of the information, resulting in an increase in budget usage.

3. Use producer panels and other face-to-face methods to collect information on the necessary coefficients. Data obtained from these sources are usually considered to be more accurate, thus the budgets are considered more accurate and reliable.

4. Adopt the use of an electronic spreadsheet in the preparation of the state's enterprise budgets. In addition to making corrections and adjustments much faster and easier, using a spreadsheet will facilitate recommendation 5.

5. Distribute and have budgets available in multiple forms. Results of this study indicate that the availability of budgets in more than one form contributed to increased use of the budgets.

6. Allocate considerable resources to the development of budgets for speciality crops, livestock, and unfamiliar enterprises. The use of crop enterprise budgets may

decline as the crop becomes more familiar. Emphasis in these areas may increase budget usage.

During the course of this study, the researcher participated in the development of enterprise budgets for eight agricultural enterprises produced in Utah. Whenever possible, the preceding recommendations were employed. Copies of these budgets are included in Appendix B and hopefully may serve as useful models.

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APPENDICES

Appendix A. Survey Forms

_____, Farm Management Specialist

_____ Male Female

1. Are you directly involved in the preparation of enterprise budgets for your state?
   Yes No

2. How many crop budgets are constructed on a regular basis in your state?

3. How many livestock budgets are constructed on a regular basis in your state?

4. How often are major crop and livestock budgets updated in your state?
   ___every year ___as needed
   ___every other year ___on demand
   ___every third year
   ___every forth year
   ___every fifth year

5. How many requests do you get for budgets and budget information each year?

6. What percent of the requests for budgets and budget information comes from the following groups?
   ___ a. Farmers/Ranchers
   ___ b. County Agents
   ___ c. Financial institutions
   ___ d. Food processers
   ___ e. Food retailors
   ___ f. County government
   ___ g. State government agencies
   ___ h. Federal government agencies
   ___ i. Other (please specify)_____

7. What percent of the funding for budget preparation comes from the the following sources?
   ___ a. Agricultural Experiment Station
   ___ b. Department of Ag. Economics
   ___ c. State Department of Agriculture
   ___ d. Other (please specify)_____

8. How many FTEs are involved in budget construction?

9. By what means are your budgets constructed?
   ___ a. Budget Generator
   ___ b. Spread sheet
   ___ c. Manually
   ___ d. Other (please specify)_____

10. What geographic basis are your budgets based on?
   ___ a. State
   ___ b. Regional
   ___ c. County

11. What is the main source of price information used to prepare budgets for your state?
   ___ a. County Agent
   ___ b. USDA
   ___ c. State reporting service
   ___ d. Private reporting service
   ___ e. Extension specialists
   ___ f. Producers
   ___ g. Other (please specify)_____

12. What is the main source of input information used to prepare budgets for your state?
   ___ a. County Agents
   ___ b. Extension specialists
   ___ c. Producers
   ___ d. Farm management groups
   ___ e. Other (please specify)_____

13. Are producer panels used to gathering information for the construction of budgets?
   Yes No

   If yes, would you rate their level of involvement on a scale of 1 - 5. (5-high, 1-low)
   5 4 3 2 1

14. Are County Agents involved in providing information to construct budgets?
   Yes No

   If yes, would you rate their level of involvement on a scale of 1 - 5. (5-high, 1-low)
   5 4 3 2 1

   Also, if yes, have they received direct training concerning gathering information for enterprise budgets?
   Yes No

15. Should (more, less, the same) resources be devoted to budget construction in your state? Why?

16. How is your budget information published and distributed?
    a. Individual sheets
    b. Part of a booklet
    c. Software
    d. Other (please specify)_____

17. What is the authorship of published budgets?
    a. Specialists only
    b. Agents and Specialists
    c. Other (please specify)_____

18. Does the publishing of budgets "count" in tenure, promotion, or salary considerations?
    Yes No

    If yes, would you rate their level of consideration on a scale of 1 - 5 (5-high, 1-low)
    5 4 3 2 1

19. How long have you been in Extension?

20. How long have you been in your current position?

21. What percent of your time is devoted to Extension?

_____ County, _____

_____ Male Female

1. What are the five major crop enterprises in your county, in order of importance, and what was their 1988 acreage and / or production?

_____
_____
_____
_____
_____

2. What are the three major livestock enterprises in your county, in order of importance, and their January 1, 1989 numbers.

_____
_____
_____

3. For which of these crop and livestock enterprises do you have enterprise budgets?

Crops			L/S		
_____	Y	N	_____	Y	N
_____	Y	N	_____	Y	N
_____	Y	N	_____	Y	N
_____	Y	N			
_____	Y	N			

4. When were these budgets last updated?
_____within the last year
_____1 - 2 years
_____2 - 5 years
_____over 5 years

5. What is the estimated current population of your county?

6. How many agricultural producers are there in your county?

7. What is the value of the agricultural production in your county on an average year?

8. What is the percent of agricultural producers in your county with gross receipts,
___ a. Under $100,000
___ b. Between $100,000 and $250,000
___ c. Over $250,000

9. Do you use enterprise budgets in your work as a County Agent?
   Yes No

10. How many times in the past year would you say you have referred to enterprise budgets for information?

11. What percent of the requests for budget information comes from the following groups?
    ___ a. Agricultural producers
    ___ b. Financial institutions
    ___ c. Food processers
    ___ d. Food retailors
    ___ e. County government
    ___ f. State government agencies
    ___ g. Federal government agencies
    ___ h. Other (please specify)_____

12. Who has the major responsibility to construct budgets for your state and county?

13. Do you provide information to any agency constructing budgets?
    Yes No

    If yes, what type of information
    ___production costs
    ___input information
    ___prices
    ___arrange producer panels
    ___other (please specify)_____

14. Using the following scale
    5-extremely useful
    4-moderately useful
    3-occassionaly useful
    2-seldom useful
    1-not at all useful
    0-don't know

    please respond to the following questions concerning the usefullness of budgets in providing
    ___ a. Breakeven analysis
    ___ b. Price projections
    ___ c. Production alternatives
    ___ d. Marketing alternatives
    ___ e. Feasibility of alternative crop and livestock enterprises

15. Should (more, less, the same) resources be devoted to budget construction in your state?

16. In what manner do you feel the budgets your state produces should be published and distributed?

17. What is the authorship of published budgets?
    a. Specialists only
    b. Agents and Specialists
    c. Other (please specify)_____

18. Does the publishing of budgets "count" in tenure, promption or salary considerations?
    Yes No

    If yes, would you rate their level of involvement on a scale of 1 - 5 (5-high, 1-low)
    5 4 3 2 1

19. How many years have you been employed as a County Agent?

20. How many years have you been in your present county?

21. What college degrees do you hold?
    ___BS or BA
    ___MS / MBA / etc.
    ___PhD / ED / ect.

22. What were your major fields of study?
    BS_____
    MS_____
    PhD_____

Appendix B. 1989 Utah Enterprise Budgets

Cow/Calf Operation Budget
Estimated Costs and Returns Based on a 200 Cow
Cow/Calf Operation Located in South Central Utah (1988)

	Units	Number	Weight	Price	Total Value	Amount per cow	Your Value
Receipts:							
Calves							
Steers		80	420	$ .92	$30,912	$154.56	____
Heifer		60	385	$ .87	$20,097	$100.49	____
Culled Animals							
Bulls		2	1400	$ .55	$ 1,540	$ 7.70	____
Cows		20	925	$ .45	$ 8,325	$ 41.63	____
Total Receipts		----------			$60,874	$304.38	____
Cash Costs:							
Fed. Grazing Fees	AUM	1449		$ 1.86	$ 2,695	$ 13.48	____
Hay	Tons	414		$80.00	$33,120	$165.60	____
Aftermath	AUM	207		$ 8.25	$ 1,708	$ 8.54	____
Replacement Bulls		2		$1400.00	$ 2,800	$ 14.00	____
Vet/Medicine					$ 879	$ 4.40	____
Trucking					$ 4,000	$ 20.00	____
Marketing					$ 925	$ 4.63	____
Repairs					$ 1,900	$ 9.50	____
Property Tax					$ 2,134	$ 10.67	____
Insurance					$ 534	$ 2.67	____
Interest					$ 1,020	$ 5.10	____
Miscellaneous					$ 1,200	$ 6.00	____
Total Cash Costs		----------			$52,915	$264.59	____
NonCash Costs: Depreciation		----------			$ 7,334	$ 36.67	____
Return to Land and Management		----------			$ 624	$ 3.12	____

South Central Utah
Cow/Calf Operation
Size: 200 Head

Assumptions:

Livestock investment includes 200 mother cows and seven bulls. Cows are raised and have a 10 percent cull rate. Bulls are purchased and have a 28 percent cull rate. A weaned calf crop of 80 percent is assumed. Replacement cows are selected from the calf crop.

Management practices consist of calving out in March, and selling in November. The cows and bulls are fed high protein alfalfa January-April, turned onto the range May-November, and graze the aftermath in December. Labor is provided by the operator and family.

Interest expense is based on an operating loan to cover 50% of applicable cash costs for 6 months @ 13% per annum.

Budget prepared by Doug Eck, Grant Esplin and DeeVon Bailey in cooperation with a producer panel.

Corn Grain Budget
Estimated Costs and Returns for Corn Grain Production (1988)
Box Elder County Furrow Irrigation System

Per Acre Basis

Item	Unit	Quantity	Price	Total	Your Farm
Receipts:					
Yield per Acre	Bu.	160	$ 3.30	$528.00	_____
Total Receipts	----------			$528.00	_____
Purchases:					
*Nitrogen	unit	250	.24	$ 60.00	_____
*Prosphate	unit	75	.32	$ 24.00	_____
Alachlor	qt.	2	$ 6.00	$ 12.00	_____
**Atrazine	gal.	.33	$10.50	$ 3.50	_____
2-4-D	lbs.	.33	$ 3.90	$ 1.29	_____
***Phorate	lbs.	6.75	$ 1.48	$ 10.00	_____
**Disulfoton	Aerial Application			$ 3.00	_____
Seed	lbs.	15.5	$ 1.50	$ 23.25	_____
Water	share	.5	$13.00	$ 6.50	_____
**Soil Test				$ .07	_____
Total Purchases	----------			$143.61	_____

Machine Costs

Operations:	Times	Fixed	Variable	Labor	Total	
Plowing	1	15.81	7.34	2.16	$ 25.31	_____
Disking	2	16.64	2.67	.77	$ 23.52	_____
Triple-K	1	4.61	1.30	.45	$ 6.36	_____
Land Plane	1	8.24	2.77	.96	$ 11.97	_____
Planting	1	Custom	----------		$ 10.00	_____
Fertilizer App.	1	Custom	----------		$ 3.00	_____

Machine Costs Cont.

Operations:	Times	Fixed	Variable	Labor	Total	Your Farm
Herbicide App.	2	3.60	.89	.50	$ 6.38	_____
Rotary Hoeing	1	8.17	2.87	.90	$ 11.94	_____
Cultivating	2	12.96	2.91	1.11	$ 21.00	_____
Irrigation	5	1.32	.25	1.65	$ 12.72	_____
Combining	1	Custom ----------			$ 23.00	_____
Hauling	1	Custom ----------			$ 5.00	_____
Drying	1	Custom ----------			$ 24.00	_____
Operating Interest		@ 13% for 6 months			$ 16.67	_____
Total Operating Costs ----------					$200.87	_____
Total Purchases Plus Operating Costs ----------					$344.48	_____
Return to Land and Management ----------					$183.52	_____

* Liquid fertilizer

** Purchases made every third year, 1/3 of cost is included each year

*** Pesticide applied while drilling

Budget prepared by Doug Eck, Thomas Reeve and DeeVon Bailey in cooperation with a producer panel.

Dairy Budget
Estimated Costs and Returns Per Cow (1988)
For Three Herd Sizes

	Small (50 cows) 15,000 lbs.	Medium (90 cows) 17,000 lbs.	Large (180 cows) 19,000 lbs.	Your Farm
Receipts:				
Milk Sales 1/	$ 1732	$ 1964	$ 2195	_____
Cull Cows 2/	$ 203	$ 203	$ 203	_____
Bull Calf 3/	$ 42	$ 42	$ 42	_____
Heifer Calf 4/	$ 50	$ 55	$ 60	_____
Total Receipts:	$ 2027	$ 2264	$ 2500	_____
Costs:				
Variable Costs				
Feed 5/	$ 870	$ 914	$ 952	_____
Vet & Medicine 5/	$ 27	$ 26	$ 33	_____
Supplies & Breeding	$ 106	$ 134	$ 128	_____
Hauling, etc. 5/	$ 57	$ 65	$ 72	_____
Labor	$ 250	$ 250	$ 250	_____
Total Variable Costs:	$ 1310	$ 1389	$ 1435	_____
Fixed Costs:				
Cow Investment 6/	$ 105	$ 114	$ 122	_____
Cow Replacement 7/	$ 288	$ 313	$ 338	_____
Facilities 8/	$ 253	$ 150	$ 180	_____
Equipment	$ 121	$ 66	$ 80	_____
Total Fixed Costs:	$ 767	$ 643	$ 720	_____
Total Costs:	$ 2077	$ 2032	$ 2155	_____
Returns Per Head to Capital Assets and Management	$ -50	$ 232	$ 345	_____

1/ at $11.55 per hundredweight (cwt.). 2/ Assuming 33% turnover with 3% death loss and 30% sold as 1,350 pound cull cows at 45 cents per pound. 3/ at .40 head per cow per year. 4/ at .40 head per year. Value increases as herd productivity increases. 5 Average production costs taken from actual farm records in Cache County. 6/ at 12% interest. 7/ at 1/3 of value. 8/ Taken from producer survey conducted by Department of Economics, Utah State University.

Budget prepared by Doug Eck, Clark Israelsen, and DeeVon Bailey.

Barley Budget
Estimated Costs and Returns for Barley Production (1988)
Cache County, Wheel Line Gravity Flow Sprinkler Irrigation

Per Acre Basis

Item	Unit	Quantity	Price	Total	Your Farm
Receipts:					
Yield per Acre	cwt.	38.4	$ 5.75	$220.80	_____
Total Receipts 1/:				$220.80	_____
Purchases:					
Seed	LB.	90	.10	$ 9.00	_____
Nitrogen	LB.	80	.24	$ 19.20	_____
2-4-D	LB.	.5	$ 3.90	$ 1.95	_____
Diclofop	lbs.	.75	$ 6.78	$ 5.09	_____
Water	share	.5	$13.00	$ 6.50	_____
Total Purchases:				$ 41.74	_____

Machine Costs

Operations:	Times	Fixed	Var.	Labor	Total	
Fertilizer Applic.	1	Custom			$ 3.00	_____
Herbicide Applic.	2	2.92	.39	.25	$ 4.20	_____
Plowing	1	12.73	5.18	2.88	$ 20.79	_____
Disking	1	6.28	1.24	.77	$ 8.29	_____
Harrowing	1	2.46	.99	.77	$ 4.22	_____
Planting	1	8.48	2.49	1.23	$ 12.20	_____
Combining	1	Custom			$ 22.50	_____
Hauling	1	Custom	@ .18/cwt.		$ 6.91	_____
Irrigation	2	18.83	.45	.90	$ 21.53	_____
Storage for 6 months	1	.03/cwt./month			$ 6.91	
Operating Interest	@ 13% for 6 months				$ 6.54	_____
Total Operating Costs					$117.09	_____
Total Purchases Plus Operating Costs					$158.83	_____
Return to Land and Management					$ 61.97	_____

1/ By-products such as straw or grazing would also add to total receipts. However, additional costs would also be incurred. The reader should calculate the receipts and expenses for these by-products for his or her farm.

Budget prepared by Doug Eck, Don Huber and DeeVon Bailey.

Winter Wheat Budget

Estimated Costs and Returns for Winter Wheat Production (1988)
Box Elder County, Not Irrigated, 50 Percent Summer Fallow Rotation
(No Participation in Government Program)

Per Acre Basis

Item	Unit	Quantity	Price	Total	Your Farm
Receipts:					
Yield per Acre	BU.	30	$ 3.41	$102.30	_____
Total Receipts: 1/:		----------		$102.30	_____
Purchases:					
Seed	LB.	60	$ .12	$ 7.20	_____
Nitrogen	LB.	40	$ .24	$ 9.60	_____
Chlorsulfuron	oz.	.17	$26.40	$ 4.49	_____
Total Purchases		----------		$21.29	_____

Machine Costs

Operations:	Times	Fixed	Var.	Labor	Total	
Fertilizer Applic.	1	Custom	----------		$ 3.00	_____
Herbicide Applic.	1	Custom	Airplane	----	$ 2.75	_____
Disking	1	4.49	3.55	.51	$ 8.55	_____
Chisel Plowing	1	3.24	2.57	.45	$ 6.26	_____
Rod Weeding 2/	2	4.26	1.48	.23	$ 7.68	_____
Planting	1	4.93	3.41	.41	$ 8.75	_____
Combining	1	13.33	4.14	.83	$18.30	_____
Hauling	1	Custom	.22/cwt.		$ 3.96	_____
Storage for 6 mths.	1	.03/cwt./month			$ 3.24	_____
Operating Interest	@ 13% for 6 months				$ 3.48	_____
Total Operating Costs					$65.97	_____
Total Purchase Plus Operating Costs					$87.26	_____
Return to Land and Management					$15.04	_____

1/ By-products such as straw or grazing would also add to total receipts. However, additional costs would also be incurred. The reader should calculate the receipts and expenses for these by-products for his or her farm. 2/ On summer fallow acreage.

Budget prepared by Doug Eck and DeeVon Bailey.

Winter Wheat Budget
Estimated Costs and Returns For Winter Wheat Production (1988)
Box Elder County, Not Irrigated, 50 Percent Summer Fallow Rotation
(With Participation in Government Wheat Program)

Per Acre Basis (72.5% Seeded 27.5% Set Aside)

Item	Unit	Quantity	Price	Total	Your Farm
Receipts:					
Yield Per Acre 1/	BU.	30x.78=23.40	$ 3.41	$79.79	_____
Government Payments	BU.	23.40	$ .69	$16.15	_____
Total Receipts 2/				$95.94	_____
Purchases 3/:					
Seed	LB.	43.50	$ .12	$ 5.22	_____
Nitrogen	LB.	29.00	$ .24	$ 6.96	_____
Chlorsulfuron	oz.	.12	$26.40	$ 3.17	_____
Total Purchases				$15.35	_____

Machine Costs

Operations 4/:	Times	Fixed	Var.	Labor	Total	
Fertilizer Applic.	1	Custom			$ 2.18	_____
Herbicide Applic.	1	Custom Airplane			$ 1.99	_____
Disking	1	4.49	2.57	.37	$ 7.43	_____
Chisel Plowing	1	3.24	1.86	.33	$ 5.43	_____
Rod Weeding 5/	2	4.26	1.07	.17	$ 6.74	_____
Planting	1	4.93	2.47	.30	$ 7.70	_____
Combining	1	13.33	3.00	.60	$16.93	_____
Hauling	1	Custom .22/cwt.			$ 3.09	_____
Storage for 6 months	1	.03/cwt./month			$ 2.53	_____
Weed ctrl on set aside	2	4.26	1.07	.17	$ 6.74	_____
Operating Interest	@ 13% for 6 months				$ 2.70	_____
Total Operating Costs					$63.46	_____
Total Purchases Plus Operating Costs					$78.81	_____
Return to Land and Management					$17.13	_____

1/ Assumes 22% actual reduction in production for a farm with a 27.5% set aside. See budget for farm not participating in the government winter wheat program. 2/ By-products such as straw or grazing would also add to total receipts. However, additional costs would also be incurred. The reader should calculate the receipts and expenses for these by-products for his or her farm. 3/ Purchases are reduced by 27.5% to reflect 27.5% in set aside. 4/ Variable and labor costs are reduced 27.5% to reflect 27.5% fewer acres planted. Fixed costs are unchanged. 5/ On summer fallow acreage.

Budget prepared by Doug Eck and DeeVon Bailey.

Tart Cherry Budget
Estimated Costs and Receipts From Tart Cherry Production (1988)
Utah County, Trickle Irrigation System, 130 Trees Per Acre
Per Acre Basis

Item	Unit	Quantity	Price	Total	Your Farm
Receipts:					
Yield Per Acre	lbs.	14,000	.15	$2100.00	_____
Total Receipts				$2100.00	_____
Purchases:					
Fertilizer					
Nitrogen	lbs.	260	.24	$ 62.40	_____
Herbicide					
Glythosate	qt.	1	15.39	$ 15.39	_____
Dacamine	qt.	1.67	3.79	$ 6.33	_____
Terbacil	qt.	.83	19.53	$ 16.21	_____
Diuron	lbs.	.83	3.80	$ 3.15	_____
Insecticide					
Dormant Oil	gal.	4	2.50	$ 10.00	_____
Parathion	qt.	1.50	6.75	$ 10.13	_____
Zinc 50	lbs.	7	1.02	$ 7.14	_____
Sulfur	lbs.	60	.26	$ 15.60	_____
Mouse Bait	lbs.	5	1.10	$ 5.50	_____
Replacement Trees	no.	1.3	5.00	$ 6.50	_____
Water	share	2.5	6.00	$ 15.00	_____
Total Purchases				$ 173.35	_____

Operations:	Times	Machine Costs Fixed	Variable	Labor		
Fertilizer Appl.	1	4.59	1.80	1.60	$ 7.99	_____
Herbicide Appl.	2.2	10.82	2.23	2.00	$ 20.13	_____
Insecticide Appl.	4	15.35	4.45	1.67	$ 39.83	_____
Bee Rental	1 hive per acre				$ 10.00	_____
Frost Control	30 hrs/yr	140.70	53.30	3.75	$ 197.75	_____
Irrigation	16 acres/day for 120 days	121.56	79.48	26.00	$ 227.04	_____
Harvesting	1	226.67	133.67	52.25	$ 412.59	_____
Brush Removal	4	30.35	2.73	2.00	$ 49.27	_____
Pruning/Trimming	1	.78	8.00	54.17	$ 62.95	_____
Rodent Control	1	8.99	4.00	3.75	$ 16.74	_____

Operating Interest @ 13% for 6 months	$ 42.76	_____
Total Operating Costs	$1087.05	_____
Eatablishment Cost* $5866/acre over 20 yrs @ 12.00%	$ 785.00	_____
Total Operating Cost Plus Purchases and Establishment	$2045.40	_____
Return to Land and Management	$ 54.60	_____

*Based on estimates of establishment costs in Michigan by Michael Kelsey and adjusted for land costs in Southern Utah County.

Budget prepared by DeeVon Bailey, Dean Miner and Doug Eck in cooperation with a producer panel.