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ON
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**IDENTIFICATION AND PRIORITIZATION OF RESEARCHABLE QUESTIONS IN
AGRICULTURAL ECONOMICS**

Clarence F. Davan Jr¹

Introduction

The combination of declining farm commodity prices, sharply rising interest rates, world over-production of agricultural commodities, depressed world economy, increasing world competition for the same agricultural markets, changing consumer diets, and United States agriculture becoming more export dependent during the early and mid-1980's, dealt a severe economic blow to many U.S. farmers and agribusinesses.

The purpose of this research project is to "Identify and Prioritize Researchable Questions in Agricultural Economics". It was commissioned by

¹Clarence F. Davan Jr. is President of the Davan Consulting International, Englewood, Colorado. Dr. Davan was the facilitator for the Cooperative Research Service, USDA research project to, "Identify and Prioritize Researchable Questions in Agricultural Economics". Drs. Roland R. Robinson, and Clark R. Burbee, Principal Agricultural Economists, Cooperative State Research Service, USDA, Washington D.C. conducted the research on AERIS/CRIS for this study; also, acknowledgement is given to each of them for input and recommendations throughout the research study.

the Cooperative State Research Service, United States Department of Agriculture (CSRS/USDA), in June 1986, and completed December 1987.

This project has sought the expertise from all disciplines in the agricultural system, to identify the major agricultural problems facing agriculture, to identify and prioritize the major agricultural economic researchable questions to solve these problems, and to identify the users of the research results from these major researchable questions.

It has been reported by CSRS/USDA officials that there has been significant decline in funding for agricultural economic research from CSRS/USDA administered sources.

J.P. Jordan, administrator of CSRS/USDA, made several important points in his paper before the 1985 AAEA annual meetings in Ames, Iowa. Agriculture and its sciences are facing new challenges today and are at a pivotal point in history. Further, the first basic research need is to predict change rather than trends. In particular, there will be no increase in research funding within a discipline - any discipline - without the development of priorities and the clear, concise articulation of researchable questions (Jordan). The purpose of this CSRS/USDA research project is to assist the agricultural economic profession in this matter.

Situation

Global supply/demand balance for agriculture is the most important component of the agricultural economic environment. The long-run trend since the late 1800's has been for lower farm prices, except for the World War II, and the early 1970's. The major theme in the 1950's, and 1960's

was "Feed the World" - we will never have enough food to feed all the people in the world. This was also evident, during this period, by our own farm policies, which encouraged agricultural production. In the 1970's, it was predicted that this lower price trend would reverse and we would see continually higher prices for agricultural commodities. A government study predicted continually rising prices for agricultural commodities. The report The Global 2000 Report to the President, concluded: "After decades of generally falling prices, the real price of food is projected to increase 95 percent over the 1970 - 2000 period" (Barney, p. 17). This price prediction, like many others, was wrong. The theme, "The Agricultural Golden Years Are Before Us", portrayed during this period, has had a tremendous influence on our agricultural problems.

Production of total grain in the United States has increased about 30 percent between 1980 and 1985. During this same period, domestic demand increased only 16 percent.

The major driving force for change in farm commodity prices is the level of export demand. In 1980, approximately 30 percent of U.S. farm production was exported, this has dropped to 20 percent in 1985. Exports grew from \$7 billion in 1970 to \$41 billion in 1980, but declined to \$29 billion in 1985. The United States had 60 percent, 119 million metric tons, of the total world coarse grain exports in 1980. This dropped to 94 million metric tons in 1986, thus giving the United States only 37 percent of the total world coarse grain export (Newman).

The United States farm debt has soared from \$141 billion in 1979 to over \$212 billion in the mid-eighties. We have gone from a labor intensive to a capital intensive agriculture. During the same period farm assets,

primarily land, has dropped about \$100 billion, creating a big imbalance in the farmer's debt-equity ratio. This, coupled with world overproduction, a depressed world economy, greater competition by foreign producers, and changing diets has created the present situation:

- Low commodity prices;
- The highest number of farm and bank failures since the 1930 depression; and
- Accelerated adjustments in the size, location, and number of agri-business firms.

Changes in world marketing institutions have made obsolete the results of research undertaken earlier on the structure, conduct, and performance of major world food and fiber marketing systems. New research efforts must focus on assessing the efficiency and performance of agricultural institutions involved in world markets instead of just the domestic market (AGR 101, USDA, p. 34).

The United States and foreign agricultural environment is changing so rapidly that it has become unclear where the agricultural economics research program should focus its efforts in the Cooperative State Research Service, United States Department of Agriculture. There has been a significant decline in funding support for agricultural economics from CSRS administered sources. In 1978, 12.8% of CSRS administered funds were allocated to experiment station economics research programs. By 1983, only 5 years later, this relative share had declined to 8.2% (Christensen and Robinson).

The objective of this CSRS research study is to develop an operational plan for Agricultural Economics that identifies and sets priorities in a

clear concise manner on researchable agricultural economics questions that offer substantial return on investment and which will address critical state, national, and international agricultural issues.

Methodology

The methodology that was used to conduct this CSRS/USDA research study to identify and prioritize researchable questions in Agricultural Economics is similar to that used by agribusiness industries. That is to obtain available data and information on a timely basis from many expert sources in the discipline being researched, permitting timely recommendations and decisions. The methodology was designed to be conducted in five phases. Each phase is an entity. Therefore, if the study stopped at the end of any phase, conclusions and recommendations can still be made.

Various literature sources (1982-1986) dealing with research priorities in agriculture, specifically agricultural economics, were reviewed. These books, reports, and articles were written by agricultural experts in the agricultural industry, academic institutions, and government.

The steering committee members for this project were carefully selected and represent agricultural experts from: farm suppliers, banking, farming, cooperatives, international, commodities, Congressional Committees, American Agricultural Economics Association, World Bank, Experiment Stations, Extension Service, Farm Foundation, consumer, food processing, national governor's association, retail food, restaurants, National Academy of Science, and the Economic Research Service/USDA.

The general purpose of the steering committee was to provide direction, support, guidance, and counsel to the project. The specific purpose of the committee was to help determine what we need to know (develop a questionnaire), identify agricultural groups to survey, arrange meetings with the agricultural groups to be surveyed, provide information and/or papers on studies related to this study, and provide linkages with other similar studies being conducted.

The questionnaire was designed to identify: 1) the major problems in agriculture (domestic and international), 2) the researchable questions in agricultural economics, and 3) the users of the results from the agricultural economics research on the final researchable questions.

Over 550 persons were surveyed from the following nineteen groups:

- Chicago Board of Trade
- CSRS Steering Committee
- U.S. Export Development Council
- AAEA Executive Council
- Agricultural Economic Department Heads - North Central Region
- Agricultural Economic Department Heads - Western Region
- Agricultural Economic Department Heads - Southern Region
- Agricultural Economic Department Heads - Northeastern Region
- Extension Committee on Organization and Policy (ECOP)
- International Trade Council
- Economic Research Service - USDA
- Agricultural Finance
- Farmers
- Fertilizer and Seed Wholesalers

- Experiment Station Committee on Organization and Policy (ESCOP)
- Extension Sub-Committee on Natural Resources
- Elevator Operators
- Consumers
- Agricultural Commodity Brokers

The problems in agriculture and researchable questions in agricultural economics identified in the survey were prioritized. The researchable questions identified in the survey were compared to the problems identified in the literature review. Also, the researchable questions identified in the survey were compared to the agricultural economics research that is presently being conducted to determine research opportunities. This CSRS/USDA study identified the major users of the research results from researchable questions in agricultural economics.

Identification and Prioritization of Major Agricultural Problems

The Joint Council on Food and Agricultural Sciences, a congressionally mandated group representing the participants of agricultural research, extension, and teaching in government, universities, and the private sector, set the following national agricultural priorities (Joint Council):

- Increase agricultural profitability through management;
- Improve water quality and management;
- Expand biotechnology efforts on plants, animals, and microbes;
- Develop necessary scientific and professional human capital;
- Improve human nutrition and understanding of diet/health relationship.

All the priorities set by the Joint Council warrant economic research consideration. There is no shortage of major agricultural problems affecting domestic and foreign agriculture. There is a lack of clear, concise, and prioritized researchable questions in agricultural economics based on the future environment.

The major agricultural problems identified in this CSRS/USDA study are derived from nineteen separate group surveys, which included approximately 550 people, plus over 50 persons that were individually surveyed, representing all disciplines in the total agricultural system. (Refer to Methodology section of this report for details on how the survey was conducted).

Identification and prioritization of the present and future major problems affecting the total agricultural system will aid in the identification and prioritization of the researchable questions in Agricultural Economics.

Following are the prioritized major agricultural problems identified (prioritized on a scale of 1-10, 10 being highest):

<u>Major Agricultural Problems</u>	<u>Priority</u>
• Foreign countries are becoming more competitive in agricultural production and marketing.	10
• United States producers and agribusinessmen have inadequate international marketing skills and knowledge about the marketing system.	10
• U.S. and foreign import/export trade policies discourage free trade.	10

- New U.S. agricultural production and marketing technologies are being transferred internationally without determining long-run economic consequences. 10
- Overproduction of agricultural commodities - is encouraged by U.S. and foreign farm policies. 10
- Macro-economic policies have unknown consequences in U.S. agriculture. 9
- United States farmers are production oriented and don't adequately know marketing and financial management. 8
- Research, teaching, extension, and research communications by the universities and government have not changed to meet present and future challenges in agriculture. 7
- Diet changes are occurring in the United States and foreign countries with unknown impacts on future demand for commodities. 7
- Agriculture in the United States is highly export dependent which increases market instability. 6
- Rigidity and stagnation in United States agricultural policy - sending the wrong signal to the U.S. agricultural producers. 6
- Deteriorating infrastructure, income, and employment opportunities in rural communities - which is increasing the input and marketing cost to agriculture. 6
- Farm income is very dependent on government programs. 5

- Research results are not directed to specific users (audience) that needs the results to make a prudent decision. 5
- A lack of alternatives have been identified for crop and livestock production when they become chronically non-profitable. 5
- Limited known non-food and industrial uses for agriculturally produced commodities. 5
- Use of inappropriate soil and water conservation practices are increasing the long-run costs to agriculture and society. 4
- Overvalued agricultural assets. 4
- Too many resources committed to agricultural production. 3
- Third world debt has negative impacts on U.S. agricultural exports. 3
- Consumers are indifferent to the farmer's problems and their consequences. 2

During each group survey, representatives of each discipline categorically prioritized their problems according to their respective objectives. This is very difficult to capture statistically or scientifically; however, Table 1 makes an attempt to prioritize each major agricultural problem area by designating it to the appropriate agricultural discipline according to the data collected in the CSRS/USDA surveys.

The farm suppliers, banking and finance, farmers, farm retailers, and the consumers are the "operational" agricultural disciplines, thus users of the research results. Academia and government are the researchers and

primary users of the research funds appropriated and reactors to the operational agricultural disciplines, policies, and the political system (Table 1).

The data in Table 1, show that farm suppliers, including bankers, denote the major problem areas (finance problems and loss of international markets) to be those that provide the necessary operating income to their clients (farmers) to cover their (farmers) input expenses. The major problem areas (loss of international markets and financial problems) denoted by the farmers are those that limits their operating capital and net returns. The consumers evaluation of the agricultural problem areas were in accordance to their objective - plentiful food and fiber at reasonable price, employment and income, and quality of life. The academic and government disciplines were essentially the same in prioritizing the major agricultural problem areas. Collectively, all the agricultural disciplines ranked international trade (loss of markets, lack of comparative advantage, and poor trade policies) as our biggest problem area, followed closely by agricultural marketing (at the farm level), agricultural finance, agribusiness management, agricultural policy (U.S. farm policy) and agricultural prices/income. Those agricultural disciplines of lesser importance were: farm production (production efficiency is the consideration in this problem area verses overproduction), community resources, consumer economics, and economic theory.

Table 1. Prioritization of major agricultural problem areas by various agricultural disciplines¹

Agricultural discipline	Problem Areas										
	Farm prod.	Agri. mkt.	Agri. bus. mgt.	Price/income	Ag. policy	Int'l. trade	Ag. finance	Nat'l. res.	Comm. res.	Cons. econ.	Econ. theory
Farm suppliers	4	7	6	8	5	9	10	2	1	3	0
Banking/Finance	4	8	6	7	5	10	9	1	3	2	0
Farmers	2	10	7	6	5	8	9	3	4	1	0
Farm retailers	5	9	7	4	6	10	8	1	2	3	0
Consumers	6	5	4	1	3	7	2	8	9	10	0
Academics	4	9	8	5	6	10	7	3	2	1	0
Government	3	9	8	5	7	10	6	4	2	1	0
Total	28	57	46	36	37	64	51	22	23	21	0
Rank ²	7	2	4	6	5	1	3	9	8	10	11

¹Prioritization on a scale of 0-10, 10 being the highest.

²One (1) being the highest.

The data in this table point out an important consideration that must be considered before, during, and after conducting the research: Make the research "results oriented" by identifying the users of the research results and make sure the results are communicated to the user.

Identification and Prioritization of Researchable Agricultural Economic Questions

The areas of emphasis for agricultural economics research in the 1950's were production and organizational structure, Table 2 (Litzenberg, Schnieder, 1985). Information in Table 2, gathered at the 1986 American Agricultural Economic Association meetings, indicates that emphases over the next five years (1987-1992) for agricultural economics research should be in financial management, management information systems, marketing management, and business performance evaluations.

The 1982-1986 literature review from fifteen different agricultural disciplines, recommended that future agricultural economics research should be concentrated in the following major areas (in order of priority): 1) International agricultural trade and development, 2) Agricultural management, marketing and finance, and 3) Agricultural price, income and policy analysis (Table 3).

The researchable agricultural economic questions identified in this CSRS/USDA study are derived from nineteen separate surveys, which included approximately 550 people, plus over 50 persons that were individually surveyed, representing all disciplines in the total agricultural system

Table 2. Emphasis over time for agricultural economic research (*represents emphasis - see Footnote)¹

Research areas	Time Periods				
	1945-55	1956-69	1970-81	1982-Present	Next 5 years ²
Production and operations management and control	***	*****	**	*	*
Financial analysis	*	****	***	**	*****
Organizational structure	***	*****	***	*	*
Marketing management	***	****	***	**	****
Human resource planning and development	*	***	***	**	***
Business performance evaluation	**	***	**	**	****
Management information systems	*	*	**	***	*****
Ownership and control	*	*	*****	**	**

*Emphasis is assessed on a scale of 1-5 when 1 star shows very little research activity and five stars represents an extensive research effort.

¹Litzenberg, K.K. and Schneider, V.E., "A Review of Past Agribusiness Management Research", paper presented at AAEA annual meetings July 30, 1986, Reno, Nevada.

²Results of agribusiness participants in AAEA July 30, 1986 workshop (55 university, 12 business and government and 3 unclassified).

Table 3. Recommended areas for agriculture economic research¹

Researchable questions by categories	SOURCE														
	AAEA	JC	OTA	ESCOP	RFF	CSRS	WB	UN	NASA	LILP	NRC	FAS	ERS	AMS	ES
<u>Farm Market & Production Economics:</u>															
None listed															
<u>Agricultural Marketing:</u>															
How should farmers participate in prepricing	x		x					x		x			x	x	x
Post-harvest losses	x	x						x	x					x	
<u>Agricusiness Management:</u>															
Minimize fluctuating Farm Inc.	x		x			x		x							x
Useful data for farmers, etc.	x	x	x	x		x		x		x				x	x
Programs to produce profit	x	x				x		x		x					
Management, financial, marketing capabilities in Ag.	x	x	x			x		x		x					x
New management services		x	x		x			x		x				x	x
<u>Agricultural Price, Income and Policy Analysis:</u>															
Impact economic policies on trade	x	x		x	x		x	x		x		x			
U.S. International Trade Policy	x	x		x	x	x	x	x				x	x		
Future Agriculture input marketing system	x			x	x	x		x		x			x		x
Future Agriculture with <u>no</u> farm progress	x	x			x			x		x					
Role of Federal Government in Agriculture	x	x		x	x	x		x		x		x	x		
Inst. & Org. changes in Agriculture	x	x	x	x	x	x		x		x	x				
Assess implications restrict trade	x	x		x	x	x	x	x		x		x	x		
<u>International Agriculture Trade & Development:</u>															
Train agriculture to sell					x	x				x		x			
U.S. production cost competitiveness	x	x		x		x	x	x				x	x		x
Role U.S. Agriculture next 50 years	x	x		x	x		x	x		x					x
Strategy to improve exports	x	x		x	x	x	x	x		x		x	x		x
Future International markets	x	x		x	x		x	x		x		x	x		x
U.S. Agricultural products - barter		x		x	x	x	x					x			
Analyze monetary linkages		x		x	x	x	x								
Tradeoffs U.S. Agriculture & Interna. Trade		x		x	x							x	x		
Competitiveness of U.S. Agri. in 200-2050	x	x		x	x			x		x					
Transfer U.S. Agricultural Technology					x					x		x			x
How foreign controls, transfer technology					x					x					x

Table 3. Recommended areas for agriculture economic research¹ (continued)

Researchable questions by categories	SOURCE														
	AAEA	JC	OTA	ESCOP	RFF	CSRS	WB	UN	NASA	LILP	NRC	FAS	ERS	AMS	ES
<u>Agricultural Finance:</u>															
Steps to Attract Capital to Agriculture	x	x	x		x	x				x					x
Restructure Farm Debt	x		x		x		x			x					
Finance & Survival Guidelines	x		x			x				x			x		
<u>Natural Resources:</u>															
None															
<u>Community Resources:</u>															
None															
<u>Human Resource Economics:</u>															
None															
<u>Consumer Economics:</u>															
None															
<u>Economic Theory:</u>															
None															
<u>Research Methods:</u>															
None															

¹ 1982-1986 Literature Review from fifteen different agricultural disciplines

(refer to Methodology section of this report for details on how the survey was conducted).

Following are the prioritized researchable questions in agricultural economics identified from the CSRS/USDA study (the researchable questions are prioritized in three separate groups - on a scale of 1-10, 10 being highest; also, the researchable agricultural economic questions are prioritized within each group):

Group 1, priority scale from 8-10 (highest priority group):

1. What agricultural products and processed products do foreign countries want from the United States?
2. How competitive are the United States agricultural commodities and processed products in the world markets?
3. What are the United States comparative advantages in world agriculture, by each commodity and processed products, to other producing countries?
4. How to improve quality in the United States agricultural commodities and product characteristics traded internationally?
5. How can the United States become better merchants in international markets?
6. How should the United States structure its agricultural and trade policies to be on the competitive edge in international markets?
7. Will cutting our agricultural production costs make the United States competitive in the world markets?
8. What impacts have United States policies had on agricultural trade volumes and patterns?

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9. What is the impact of foreign government policies on United States agricultural exports?
10. What role should the United States play in the world agricultural market over the next fifty (50) years?
11. How competitive should United States agriculture be in world markets in the years 2000, 2025, and 2050?
12. What would United States agriculture look like and how competitive would it be in the world market if the United States had no government farm support programs over the next five (5) and then ten (10) years?
13. How should the United States transfer to and receive new technologies from foreign competitors and at what price - what is the overall economic impact of such transfers?
14. What is the national, and international economic feasibility and overall effect of each major new technology (biotechnology included) coming to the marketplace?
15. What would be the economic and political consequences of the United States not being on the competitive cutting edge of world biotechnology and computer application research?
16. What changes will take place in the United States and foreign agricultural industry during the next twenty-five (25) years?
17. What are the sources of timely factual information and data on foreign countries (country by country basis) for foreign agribusiness and policy maker decisions?
18. What are the linkages between macro-economic policies and international trade?

19. What are the linkages between macro-economic policies and international trade?
20. How should we train agricultural producers (farmers) in marketing and financial management?
21. What are the effective methods for reducing the financial difficulties in United States agriculture?
22. How should agriculture be financed in the future?
23. What data and information and in what forms do agricultural producers need to make timely and profitable decisions?
24. What are and will be sources of equity for individual agricultural proprietors?
25. How should we be training future agricultural students to cope with the changing agricultural environment in agribusiness and farming?

Group 2, priority scale from 5-7:

1. What restructuring needs to be made in the agricultural research, education, and communications (extension) programs at the universities and government agencies (USDA) to cope with the future changes in the United States and world agriculture?
2. What are the major factors affecting the domestic and international demand for food?
3. What are the consumption patterns for food eaten away from home?
4. What are the changes that will occur in the domestic and international food and fiber demands in the years 2000, 2025, and 2050?
5. How should we develop interdisciplinary agricultural research efforts within and between the public and private sectors?

6. What would happen to U.S. farm income, by farm size and enterprise, in the short and long-run without farm subsidies?
7. What do we do with the agricultural production and marketing resources that can't compete in the world agricultural market?
8. What are the policy alternatives for diversifying and diverting resources within and out of agriculture?
9. What are the impacts of agricultural structural changes on agricultural inputs, food processing, and grain trade industries?
10. What are the consequences of subsidies for agricultural land, labor, and capital?
11. What are the probabilities of crop disasters on a worldwide commodity basis?
12. What type of farm and rural structure does society want and how much is society willing to pay - who pays, and who decides who pay?
13. What are the impacts of rural economic development on farm family employment and income opportunities?
14. How can employment opportunities be increased in rural areas?
15. What are the alternative policies (methods) to improve human capital in rural areas?
16. What policies and programs are needed to facilitate adjustments in rural areas?
17. To what extent can vertical and horizontal integration improve the competitiveness of agriculture?
18. What is the economic feasibility of alternative agricultural production systems?
19. What are the non-agricultural economic uses of agricultural land?

20. What is the economic potential for new agricultural products being produced (value added), and new markets, including non-food markets, for United States agricultural commodities?
21. What is the future of agricultural cooperatives?

Group 3, priority scale 4 and below:

1. What will be the effect of higher energy costs on United States agriculture, marketing, and agribusiness?
2. How can we economically manage or reduce ground water being contaminated by agriculture?
3. How does foreign economic development, such as PL480, effect both supply and demand for agriculturally produced products?
4. How to economically, and politically raise income in the third-world countries?
5. What new policies are necessary to raise the income of third world countries?

Comparative Matrix on Present Agricultural Economic Research

This section compares what agricultural economics research is being conducted to what is recommended in this CSRS/USDA study to define and prioritize researchable questions in agricultural economics. This should show researchers the opportunities that can be undertaken in agricultural economics research. Also, it will aid in putting together joint research studies on a regional, national or an international basis.

AERIS is the acronym for Agricultural Economics Research Information System. AERIS is being designed to complement the existing Current Research Information System, CRIS, by satisfying additional information needs primarily of administrators of agricultural economics research programs.

Who is developing AERIS? AERIS is being developed by agricultural economists at the Cooperative State Research Service, USDA. The AERIS project has been conducted as part of this CSRS/USDA study.

When will AERIS be available? AERIS has been developed by administrative regions with the progression being with the 12 state North Central Region followed by Northeast, South and West. The tentative schedule is to complete the North Central Region during the spring of 1987, the Northeast in the fall of 1987, the South during winter of 1987, and the West in the spring of 1988.

By the Summer of 1988, AERIS will be operational, whereby comparisons of what is being researched in agricultural economics in all administrative regions can be made to the prioritized researchable question identified in this CSRS economic study. These comparisons will point out to agricultural economic researchers the prioritized opportunities in agricultural economic research.

Research funds for the North Central SAES totaled \$315 million, in fiscal year 1985, of which the agricultural economic departments received approximately \$17 million or 5.3% of the total SAES Research Funds (Table 4). This \$17 million was spread over 283 agricultural economic research projects which equals about \$60,000 per project.

Table 4. Research Funds for North Central SAES and Agricultural Economics Departments, FY 1985.

State	SAES dollars	Agricultural Economics Departments		
		Dollars	Share of SAES	Research projects
	- 000 -	- 000 -	- % -	-number-
Illinois	23,598	2,162	9.2	31
Indiana	32,950	1,891	5.7	29
Iowa	27,980	1,787	6.4	35
Kansas	27,956	650	2.3	16
Michigan	29,416	1,716	5.8	22
Minnesota	33,741	1,373	4.1	34
Missouri	20,078	2,000	10.0	23
Nebraska	30,472	785	2.6	12
N. Dakota	18,399	1,369	7.4	24
Ohio	24,234	1,310	5.4	22
S. Dakota	7,661	369	4.8	8
Wisconsin	38,849	1,383	3.6	27
Region - TOTAL	315,439	16,795	5.3 (Ave.)	283

Source: CRIS

The use of approximately \$21 million of research funds by the North Central SAES traditional and nontraditional departments for economic research in fiscal year 1985, varied from \$49,000 in economic theory to about \$4 million each, in agricultural price, income and policy analysis, natural resources, and agricultural marketing, respectively (Table 5).

Ongoing research programs in the North Central Region shown in Table 5 indicated that most emphasis, over 63% of the research funds, in agricultural economic research is concentrated in the following research areas:

- Agricultural price, income, and policy,
- Natural resources,
- Agricultural marketing, and
- Farm management.

International trade research, ranked number 1 in the CSRS economic study, received only about 5% of the regional research funds in the North Central Region. Agribusiness received no regional research funds in 1985 (Table 6). Given the above comparisons and the data in Tables 5 and 6, adjustments in the North Central Region research agendas should be undertaken to focus agricultural economics research on higher priority research areas, especially international trade, as indicated by this CSRS economic study.

Users of Agricultural Economics Research Results

The survey results provided primarily from agricultural economic administrators and researchers indicated that identifying the ultimate user

Table 5. Use of Funds by North Central SAES Traditional and Nontraditional Departments for Economic Research, FY 1985¹

Research area	Use of Funds		Rank ²	Rank in CSRS study ³
	Dollars	% of total		
Farm management	2,023	9.5	4	7
Agricultural marketing	3,719	17.5	3	2
Agribusiness	470	2.2	11	4
Ag. price, income, policy	3,928	18.5	1	5&6 ⁴
International trade	1,420	6.7	6	1
Agricultural finance	1,580	7.4	5	3
Natural resources	3,855	18.2	2	9
Community development	1,266	6.0	7	8 ⁵
Human resources development	70	0.3	12	
Consumer economics	986	4.6	9	10
Economic theory	49	0.2	13	11 ⁵
Research methods	1,057	5.0	8	
Other	809	3.8	10	--
TOTAL	\$21,230	100%	--	--

¹Source: CRIS, 2630 economic subclasses

²Ranked according to the percentage spent on the research area

³Refer to Table 1, page ?? of this CSRS/USDA study

⁴Agricultural prices and income ranked 5th, and agricultural policy ranked 6th (these were separated in the CSRS/USDA study)

⁵Considered one research area in the CSRS/USDA study

Table 6. Regional Research of Traditional Departments for North Central SAES, FY 1985¹

Research area	Use of Funds			Rank in CSRS study ³
	Funds	Total funds	Ranked ²	
Farm management	-000-330	- % - 6.8	4	7
Agricultural marketing	2101	43.0	1	2
Agribusiness	0	0	--	4
Ag. price, income & policy analysis	964	19.8	2	5 & 6 ⁴
International trade	257	5.3	5	1
Agricultural finance	874	17.9	3	3
Natural resources	63	1.3	9	9
Community development	0	0	--	8 ⁵
Human resources development	0	0	--	
Consumer economics	85	1.7	7	10
Economic theory	0	0	--	11 ⁵
Research methods	138	2.8	6	
Other	71	1.4	8	--
TOTAL	4883	100.0	--	--

¹Source: CSRS, 2630 economic subclasses

²Ranked according to the percentage spent on the research area

³Refer to Table 1, page 9 of this CSRS/USDA study

⁴Agricultural prices and income ranked 5th, and agricultural policy ranked 6th (these were separated in the CSRS/USDA study)

⁵Considered one research area in the CSRS/USDA study

of their research results was a badly neglected area in determining what researchable questions should be undertaken. There was agreement from the groups surveyed that it is of the utmost importance to review the needs of various agricultural groups to determine the researchable questions that would provide the necessary information to the ultimate user for making timely decisions.

The survey revealed some major problem areas in the development of an agricultural economics research agenda, which are (not in order of priority):

- The rewards system does not encourage interdisciplinary (interdepartmental) or applied research relevant to the solution of many of the researchable problems.
- Promotion and tenure is based upon writing for the professional economics journals which mainly requires theoretical and empirical articles with limited application value to the current problems.
- Identification of the ultimate users of the research results are seldom considered in developing research dissemination strategies.
- The researchers conducting the research seldom communicate their findings to the ultimate users via SAES bulletins, extension articles, radio or TV appearances, and directly with the user.
- International research has not been a primary consideration of researchers.

- The market place determines the research needs. This means that much of the research is on questions of historical significance instead of anticipated problems.
- Most research has become more specialized and narrower in application.
- Most research is conducted within the economics discipline; therefore excludes consideration of major changes in the other disciplines of the agricultural system.
- Communication networking between agricultural disciplines is poor to nonexistent.
- Production and farm management research does not consider marketing, finance, and consumer economics.

It was suggested that seminars and/or studies should be conducted to determine answers to these problems.

The groups surveyed indicated that for future agricultural economics research to have maximum value to its users, the users must be considered as an integral part of the research planning process. For example:

1. United States agriculture has increased its dependence on the international market, therefore, government policy-makers and agribusinesses trading internationally need economic information and data on the competitiveness of United States commodities in the world market to make fair and equitable trade decisions. Also, it is important for these groups to understand the trade policies of foreign countries and their effects on trade.
2. There is a tremendous need for agricultural input industries to foresee periods of major economic changes well in advance of their

expected occurrence. This requires accurate forecasting, which is a must to remain on the competitive cutting edge of world markets.

3. Farmers are in desperate need of clear, concise, and usable research results on alternative marketing techniques, alternative financial approaches, alternatives in organizational management, and alternatives to government programs for survival and profitability.
4. The consumer needs to be educated about needs of and the impacts of government policy and subsidy programs for agriculture. Misunderstanding could result in new policies unfavorable to agriculture and rural economics.

This CSRS/USDA survey identifies and prioritizes major users of the research results from researchable agricultural economics questions as follows:

- National, regional, state, and local policy makers
- Governmental agencies advising policy makers
- Lobbyist
- Agribusiness and related groups
- Farmers
- Agricultural consultants
- Farm organizations and commodity groups
- Extension Service
- University administrators
- Consumers
- News media
- Researchers including economists

Most of the groups being surveyed expressed the opinion that a process is needed within a USDA governmental agency for defining, pursuing, and disseminating research results, data, and information at strategic times on key issues affecting agriculture. There was complete agreement from participants in the survey that if results from agricultural economics research were not communicated to the ultimate user in an understandable and timely manner, there was little need to conduct the research. Also, it was agreed by those in the survey that it was the responsibility of the researcher to communicate the results of their research to all principal user groups.

Time, Costs and Returns to Conduct Research on the Agricultural Economics Researchable Questions

The value of research can be measured by the value received from the research compared to the investment to conduct the research. Also important in determining the value of research is if the research results are timely for prudent and profitable decision making.

This section provides the estimated economic value to the agricultural system from the results of research on the researchable questions identified and prioritized in this study. These estimates were made by professional agricultural economics researchers. It was understood by those making the estimates that the results would not be exacting and much subjective judgement had to go into the estimates. The criteria for making the estimates were: 1) make estimates for only one cycle of the research, 2) use 1987 dollars, 3) the research questions identified are

researchable, 4) research results will have an impact, and 5) make estimates that you have to justify and live with as if your promotions depended on them. It is realized that finding solutions to some researchable questions listed will require several research cycles to ascertain validity. However, this estimate was to determine how long would it take and how much would it cost to obtain timely results of economic benefit to the agricultural system.

Summarizing the benefit/cost estimates, indicates that it would require approximately \$12 million, over 2-years to conduct research on all the research areas identified in the study (Table 7). This \$12 million investment on research would return a direct benefit of an estimated \$195.5 million to the agricultural system, a 16 fold increase over the investment in the research. If the research is not conducted, it is estimated that there will be a gross loss to agriculture of \$91 million. Therefore, there is an economic swing factor in conducting the research of \$268.5 million or a 24 fold increase over the investment in research on the questions identified in this study. The research areas are listed in the order of importance according to the findings in this study. International trade, ranked number one in the findings, was estimated to need \$4.2 million, or about one-third of the total research dollars. This investment in international research would produce about a 19 fold increase over the investment in the research. Also, it would provide a 27 fold increase over not conducting the research. All research areas in Table 7 show a significant increase in returns to investments in research. The leverage is high enough to warrant research in all areas.

Table 7. Estimated Time, Costs, and Returns to Conduct Research on the Agricultural Economic Researchable Questions Identified in this Study¹

Research area ²	Estimates to Conduct the Research			Estimated Cost to Agriculture if Research <u>NOT</u> conducted ³
	Time	Cost	Returns	
	-years-	- million dollars -		- - - - million dollars - - - -
International trade	1-4	4.2	78	34.5
Agricultural marketing	2	1.45	26	13.5
Agricultural finance	1-2	1.1	19.5	9.0
Agricultural business mgt.	1-2	1.4	24	14.0
Agricultural policy	1-2	1.8	28	12.5
Price & income analysis	1-2	.5	7	3.0
Farm production	2	.2	2	.5
Community resources	1-2	.5	3.5	1.0
Natural resources	1-2	.3	2.5	1.0
Consumer	2	.5	5	2.0
TOTAL	--	11.95	195.5	91.0

¹This table is derived from estimates on the 51 researchable agricultural economic questions identified in this study.

²Each research area is ranked in the order of importance according to the findings in this study.

³This estimate is a gross loss to the agricultural system is no research is conducted on the researchable questions identified.

This \$12 million investment is not a one-shot investment. More dollars will have to be invested on a continuing basis because of dynamic changes and emergence of new problems.

Conclusions and Recommendations

The United States total agricultural system is and will continue to be faced with many critical problems. Agriculture is the largest U.S. industry, and is a key component for a viable U.S. economy and our overall competitiveness in the world markets.

Several important conclusions regarding the future agricultural economics research environment are drawn from this study:

- Given today's economic realities, future agricultural economics research can not be justified only on saving the consumer dollars or lowering the per unit cost of production; it must also be based on profitability and competitiveness in the world markets.
- Agricultural economists have contributed significantly to the understanding and operations of the agricultural system. However, the demands for tomorrow's knowledge, and for timely decision-making should be the basis for conducting future agricultural economics research.
- The October 19, 1987 stock market fall indicates how much influence the world economic factors have on the United States economic system. The same analogy can be carried over to U.S. agriculture. Agricultural economics researchers must conduct research based upon the total world economic and trade system.

- Agriculture in the United States is highly export dependent which increases market instability.
- The United States has lost the cutting edge in international agricultural commodity and product competitiveness and marketing skills. Future agricultural economics research should be directed toward achieving cutting edge competitiveness in world trade for U.S. agricultural commodities and products.
- Consumption patterns (diets) are changing. Therefore, there should be more research emphasis on domestic and international consumer preferences for agricultural commodities and products.
- U.S. farmers have been educated and continually taught to be production oriented. As indicated in the survey, the U.S. farmers consider marketing, finance, and agricultural business management to be the most important areas that will produce farm profitability in the future. The agricultural economics research should concentrate more research efforts in these areas and communicate the research results directly to the farmers.
- Farmers have few profitable alternative uses of their land.
- Less emphasis should be placed on agricultural economics production farm management research. Production and farm management research should include marketing and finance at the farm level for maximum profitability -- "Total Agricultural Systems Management Research".
- Agricultural economics research should be User oriented and the research results communicated to the ultimate User.
- Continual restructuring needs to be made in the agricultural

research, teaching, extension, and research communications programs at the universities and government agencies to cope with changes taking place in the United States and the world agricultural environment.

- Rural Communities have a deteriorating infrastructure, income, and employment opportunities, which is increasing the input and marketing costs to agriculture.
- Consumers of agricultural products are indifferent as long as they have access to plenty of high quality food at reasonable prices.

Following are recommendations for the development and administering of this special program to obtain funds and conduct research on the agricultural economics researchable questions identified in this study:

- Use the information from this study and develop a program to obtain \$12 million funding over two-years to conduct research on the agricultural economics researchable questions identified.
- All agricultural economics research identified in this study to be funded through the special grants program on a competitive basis.
- Have the economists in the Natural Resources, Food and Social Science/CSRS develop guidelines for communicating, administering, and monitoring this special program.
- Have the researchers conducting the research report results on a timely basis, answering the following questions:
 - 1) what has been learned to date,
 - 2) how can the results be applied to real problems,
 - 3) who are the users of the research

results, 4) are they on schedule and budget, and 5) how are they going to communicate the final results of their research on a timely basis to the ultimate user?

There were many questions that came up from various agricultural groups surveyed. These questions are listed in no order of priority:

- Who should set research agendas?
- Who are the major users of agricultural economic research results?
- Who can get the attention of politicians and policy makers?
- How should researchers be evaluated for promotion?
- How should research results be communicated to the ultimate user?
- How should more interdisciplinary (interdepartmental) research be created?
- How should networking between agricultural disciplines and departments be enhanced?
- What influences politicians to vote the way they do for various agricultural legislation?

Agricultural economists should take a leadership role in influencing the future changes that will take place in the United States total agricultural system, by accepting the challenges identified and prioritized in the agricultural economics researchable questions in this study.

The challenge to each agricultural economics researcher is to utilize their areas of expertise, select the agricultural economic researchable questions identified and prioritized in this study that fits their area of expertise, develop a clear, concise proposal statement, directed toward a specific user (audience), that can be used to garner both societal support

and adequate funding. Then conduct and communicate the research in a manner that timely decisions can be made by the user of the research results.

Research results from the prioritized agricultural economics researchable questions identified in this study will positively influence the future competitiveness and profitability of United States agriculture in this rapidly changing world; therefore, everyone in the agricultural system will be winners.

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