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COMPUTERIZED DIRECT DELIVERY OF MARKET INFORMATION

A PILOT PROJECT

FINAL REPORT

BY

ROBERT V. PRICE, WESTERN LIVESTOCK MARKETING INFORMATION PROJECT
HARLAN G. HUGHES, UNIVERSITY OF WYOMING
H. DOUG JOSE, UNIVERSITY OF NEBRASKA

May 3, 1982

Presented at AAEA meetings, Aug. 1-4, 1982, Logan, Utah.

FOREWORD

In late June 1981, Cooperative Agreement Number 12-05-300-522 was signed between the USDA Extension Service and the Colorado State University Cooperative Extension Service on behalf of the Western Livestock Marketing Information Project. The agreement was to conduct a pilot study concerning the feasibility of direct electronic delivery of marketing and management information to farm families. The project extended through March 31, 1982. This paper is a final evaluation of the study.

The authors wish to thank the numerous individuals who have cooperated with this effort. Special acknowledgements are extended to David Holder, USDA Extension; Al Stark, AGNET Central; and Robert Frary, University of Wyoming. Without the special assistance of these individuals this pilot study would never have been possible. Additionally, the support staff at WLMIP is to be commended for their diligent efforts in helping make this study a success.

The authors have enjoyed working in this area, and have uncovered many aspects of direct delivery of market information as a direct result of this pilot study. Also, several spinoffs concerning technological and subject matter problems have arisen indirectly as a result of this effort.

CHAPTER I - INTRODUCTION

Farmers' needs for marketing information have changed dramatically since the early 1970's. Increasing price variability, together with rapid inflation and closer ties to world supply and demand conditions for agricultural commodities, have resulted in increased needs for short, intermediate, and long-run marketing information. Also, farmers continually have fewer market outlets available so they must do a better job of marketing their product. The net result is that many farmers are unable to adequately evaluate marketing alternatives and, thus, are often unable to make good marketing decisions. Present Extension marketing information delivery systems need to be upgraded to keep pace with these changing demands.

Farmers base marketing decisions on information from both internal and external sources. Accounting records, production records, and budgets are examples of internal information used. Market news, outlook reports, price forecasts, and research reports are examples of external information. Internal and external information is required for almost all short, intermediate, and long-run marketing decisions.

Needs for short-run market information commonly relate to selling decisions. There are sometimes substantial risks associated with selling agricultural commodities today rather than waiting a few days, or vice versa.

Short-run decisions are relatively simple to analyze in a budgeting sense as the costs are readily predictable. The key element is the probability of price increases and decreases. Typically, university and government outlook specialists have not provided short-run market information. It has generally been left to the commodity brokerage firms and other private organizations to provide short-run market information. These sources tend to discount the risk and uncertainty aspects.

Intermediate-run needs for market information relate to such decisions as purchasing of stocker and feeder cattle, crop selections, how much fertilizer to apply, which feeds to use, and other decisions which do not result in immediate revenue. These decisions are generally more complex as the information needed to evaluate possible outcomes is more complicated and has more chance of error. University and government outlook specialists generally have been most active in providing intermediate-run information.

Examples of long-run market information needs include land purchases, irrigation development, machinery selection, cattle herd expansion, and the construction of livestock production units. These decisions, although not made as frequently as the previous types, require significant information to allow for success of a farm business. Although farm management economists have devoted much time and effort to investment analysis, outlook specialists in the university and government realm have generally concentrated very little in this long-run arena.

Because of variability in agricultural prices and production, as well as high financing requirements, producers frequently risk bankruptcy before profits from an investment can be realized. Long-run market information can also be useful in assessing the amount of risk that a specific producer can afford in making investment decisions.

A comprehensive marketing information system, used properly, could play a major role in stabilizing or increasing net farm income during the 1980's. In the coming years, farmers and ranchers are going to need more marketing information, delivered faster, and available in an easy-to-use form. Computers can and should play a major role in such a marketing information system and the associated educational needs. The rapid development of electronic technology also presents a unique opportunity for Extension to assume an even greater role in the delivery of timely market information.

Purpose of this Study

Several developments in recent years have raised the need for better information that can be used in making agricultural marketing decisions. These developments include volatility in foreign demand for U.S. products, shortages of fuel and fertilizer, changes in agricultural government programs, and droughts in some of the major agricultural areas of the United States and the rest of the world. The increased market risk is exemplified by the greater price variability now observed in livestock and grain markets. This increased price variability represents both problems and opportunities for farmers and ranchers. However, minimizing the problems and maximizing the opportunities requires accurate information presented in a useful format and provided in a timely manner.

The problem of delivering timely market information in the western United States is compounded by the vast geographical dispersion of producers. The Extension specialists and county agents must travel extensively to accommodate the needs of farmers and ranchers. Most newspapers carry very little, if any, current market data. Farm magazines are major sources of intermediate-run market information, and timeliness of that information may not be up to the standards necessary for decision making in today's market environment.

The Western Livestock Marketing Information Project was created over 25 years ago in recognition of the void that existed in the delivery of timely market information to livestock producers in the West. The proven record of WLMIP as a major source of useful intermediate-run market information for the region has been well documented.[1/] [2/] However, the changing complexities of the livestock market, combined with the rapid growth in computer technology, present the need and opportunity for WLMIP to expand services. These opportunities include direct delivery of market information at the producer level, as well as increasing service to professional economists and others in the West. It also presents the opportunity for WLMIP to go from almost exclusive emphasis on intermediate-run market information to expanding the presentation of short-run information.

AGNET is a time-sharing computer network headquartered in Lincoln, Nebraska. There are around 2,500 users on the network, with total yearly connect time of around 75,000 hours, or an average of roughly 8.5 users concurrently on a 24-hour 7-day-a-week basis. Contained in the AGNET data banks are numerous files of current information as well as programs designed for problem-solving routines. The system is very "user-friendly" and is designed for use by people with no computer background.

Previous Work

In 1979 a survey was sent to State Extension Service administrators.3/ The response of 44 state administrators that returned the survey can be summarized: (a) Thirty-seven out of 44 states placed Extension marketing programs in the range of "important" to "of highest importance." (b) Program areas identified as needing additional resources which are pertinent to this study are (with ranking indicated):

(1) Livestock and meat marketing
(2) Field crop marketing
:
(6) Market information and outlook
:
(8) Producer marketing alternatives
:

The response of 188 marketing specialists in the 44 states can be summarized as follows:

(A) Marketing problems needing more work are (in rank order):

(1) Market information
:
(3) Price discovery
(4) Risk aversion
:

(B) Reasons why marketing problems have not been addressed adequately were expressed as:

(1) Lack of financial resources
(2) Lack of data base for research
(3) Expertise not available on the staff

The study was summarized with: "It is recommended that each State Cooperative Extension Service administration with their marketing specialists and representatives of clientele groups, examine the results of this national study, analyze their state's specific needs, determine where a cooperative effort is needed with other states, and develop plans for renewing and/or initiating programs to effectively manage the problems identified."

Brown and Collins, University of Missouri, conducted a national study in 1977 on the information needs of large commercial farms.[4] The Brown and Collins study can be summarized in three items:

(1) Commercial family farmers and ranchers perceive marketing information as their number one need.

(2) Extension and universities were rated the most important source of production technology, but only of minor importance as a source of marketing information.

(3) Farmers, agri-business, Extension, and the agricultural media all expressed the belief that marketing information is critical now and will continue to be critical in the future. They also agreed that present sources of market information are inadequate.

A joint USDA/NASULGC study committee recommended in 1968 "that Extension increase emphasis on marketing and farm business management while reducing the percentage of effort in husbandry and production."[5] The study goes on to say "Extension should gradually shift towards giving more indepth training to producers and to wholesaling information through supply firms."

In spite of the emphasis placed more than ten years ago on changing Extension priorities, little progress has been made to implement the shifts. This is mainly due to lack of funding and frequently a reluctance on the part of Extension program leaders to change priorities in their Extension programs. Today we hear the same requests coming from producer organizations as we did a decade ago and there has been little response by Extension administrators.

Most Extension marketing program appraisal studies generally include recommendations for experimentation with the latest electronic and computer innovations. New York dairymen in a 1977 telephone survey felt that Extension could improve its effectiveness by placing more emphasis on the use of the computer as an educational tool.[6]

The State of Wyoming piloted the basic market information system on the AGNET computer network.[7] Four objectives of the pilot system were:

(1) To collect price information of interest to Wyoming producers.

(2) To provide county Extension Offices with the ability to retrieve market information allowing them to put together today's, yesterday's, last week's, last month's, or last year's markets of interest for use with their producers.

(3) To provide simple, down-to-earth interpretations of what market prices and associated outlook mean to Wyoming producers.

(4) To provide price forecasts for Extension personnel to use with producers in planning.

The Western Livestock Marketing Information Project piloted some initial work in computerized market information delivery in 1980. Major livestock reports (Cattle on Feed, Hogs and Pigs, etc.) were placed on AGNET, complete with analysis and interpretation. WLMIP was instrumental in substantially increasing listings of producers with hay for sale and making these listings available to areas hardest hit by the drought of 1980. In addition, WLMIP served as a clearing house for drought conditions in many areas of the Western and Plains region. This information was collected and transmitted throughout the region and forwarded to the office of the Secretary of Agriculture in Washington, D.C.

Objectives

In an effort to provide background for evaluation of electronic delivery of market information, a cooperative agreement was signed between the Colorado State University Extension Service on behalf of WLMIP and the USDA Extension Service. Subsequent cooperation was obtained from the University of Wyoming and the University of Nebraska. The objectives of the pilot study were as follows:

1. Research and develop mechanisms for direct producer access to AGNET via farmer-owned microcomputers and computer terminals.

2. Add current livestock market news information on AGNET for retrieval by producers and others.

3. Improve the documentation of marketing information and other pertinent information on AGNET and make it available to producers.

4. Improve the drought information and drought management decision making capabilities of AGNET.

5. Develop the mechanisms for providing access on AGNET to citations of research based publications relating to specific management problems.

6. Evaluate the effectiveness and efficiency of this new delivery system in providing useful information to farmers.

REFERENCES

1/ "Evaluation of the Western Livestock Marketing Information Project," Report of WLMIP Technical Advisory Committee Survey of Users, June 10, 1977.

2/ Kenneth R. Bolen, Economic Information Needs of Farmers, Report of ESCS and SEA/Extension Study, November 1979.

3/ Ed Watkins and Sharon Hoobler, Report of ECOP Subcommittee on Agriculture, Forestry, and Related Industries Extension Marketing Program and Priorities Survey, SEA/Extension, April 1980.

4/ Thomas G. Brown and Arthur Collins, Large Commercial Family Farms Informational Needs and Sources, A Report of the National Extension Study Committee, September 1, 1978.

5/ A People and a Spirit, Report of the Joint USDA/NASULGC Study Committee on Cooperative Extension, Colorado State University, 1968.

6/ Ainsle, et al, An Evaluation of Cooperative Extension Dairy Programs, Specialist Report, Cornell University, October 1977.

7/ Irv Skelton, "Wyoming Agricultural Extension Service Accomplishment Report for FY-1980," July 1980.

CHAPTER II - RESULTS

Objective I: Research and develop mechanisms for direct producer access to AGNET by farmer-owned microcomputers and computer terminals.

The technology of communication between computers of different brands and types is an involved science of its own. Different hardware requires different communication protocols and procedures. Much additional work is needed in this area and is an area that is receiving a lot of interest at the current time.

The importance of networking between microcomputers and mainframe computers housing such networks as AGNET is becoming increasingly obvious. As an example, of the 12 producers that participated in the pilot study, 9 accessed AGNET through the use of microcomputers. The other 3 used "dumb terminals" for communication. It is the authors' opinion that microcomputers will become more the norm in producer hardware in contrast to purchasing dumb terminals. This is because the microcomputer can also be used to solve on-the-farm types of production and marketing problems, handle production and accounting records, and other applications.

Current technology is readily available to enable a microcomputer to operate as a dumb terminal in communicating with AGNET. Generally, all that is required is a modem (telephone coupler) and software for the microcomputer which is generally included with the hardware coupler. Such packages for microcomputers generally run in the price range of $500 or less. See Appendix A for further documentation on some of the hardware and software that is being used with microcomputers and AGNET.

However, the technology involved in making a microcomputer into an "intelligent terminal" with AGNET is much more complex. A high degree of interest in this type of software appears evident throughout the western region.

The importance of operating a microcomputer in an intelligent mode with AGNET arises from the tremendous potential savings in telephone costs. A large part of the user's time during any terminal session is spent typing in the needed information to respond to the AGNET questions. If such files could be developed on the microcomputer before the telephone call was actually made to AGNET, much of the telephone time could be eliminated.

The authors have experienced substantial savings in telephone costs (50% or more) when using microcomputers as intelligent terminals. Additionally, the capability to access AGNET as a central warehouse for information, download the information to the microcomputer, hang up the telephone and work with information that has been accessed results in even more cost savings.

In summary, it is a relatively easy procedure to turn a microcomputer into a dumb terminal for communicating with AGNET. It becomes a little more difficult to operate in the intelligent terminal mode, but software has been uncovered in this study that makes this possible for most brands of microcomputers. The idea of interfacing farmer-owned microcomputers and

a regional computer such as AGNET could be one of the most significant thrusts in Extension Service activities for computer applications to agriculture in the coming years.

Objective II: Add current market news information on AGNET for retrieval by producers and others.

This objective has been pursued heavily since the beginning of the pilot project. The following table shows files on AGNET's MARKETS program that have been retrieved by users during the past year.

Retrievals of MARKETS files on AGNET

FILE	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR
AGPRICES	75	85	92	91	134	208	183	217	146	138	126
APRGRAIN 1/	22										
AUGGRAIN				1	28						
BEEF 2/		**3**	**32**	**45**	**82**	**88**	**68**	**81**	**107**	**97**	**96**
BEEFADVISORY	6	8	3			10	3	14	16	13	6
BRUSH									30	25	
CALHAY	**6**	**6**									
CASHBID				16	56	12					
CASHLIVE					1						
CASHMARKET	92	81	99	99	96	102	141	91	134	104	147
CATFUT	93	78	75	102	161	180	188	145	119	142	136
CATINV			12						10	13	
CATTLE	20	2				14	50	28	11	30	37
CHILE							5				
COFANALYSIS							**21**	**9**	**14**	**19**	**15**
COF7	**3**	**15**	**11**	**8**	**11**	**13**	**19**	**12**	**11**	**12**	**11**
COF23						**11**	**2**		**17**		
COLOGRAIN					**24**	**17**	**31**	**49**	**34**	**31**	**24**
COMPETE								7	10		
CORNOAT										9	12
CORNPRIC											12
CORNPROD							23	34	33	36	24
COTTON						4	13	4	6	1	
COTTONPR									1	1	3
CRPINF							21				
DAIRY							11	2			
DECGRAIN								8	11		
EFFICIENCY							10	4			
EXPORTS							46	31	45		15
FEDCATTLE		**2**	**29**	**47**	**83**	**94**	**70**	**63**	**93**	**81**	**67**
FEED							16	3	4	7	
FEEDGRAINS		6									8
FEEDSTUFFS	3	1									
FOODGRAINS		4									
FUTUREC	153	105	125	175	213	279	286	358	495	552	454
FUTUREO	48	29	33	20	64	86	92	84	95	113	72
GRAIN						21	112	122	109	132	107
GRAINC	74	82	125	107	166	183	184	177	150	165	149
GRAINO	52	56	59	54	68	84	99	100	93	100	75

GRAINREV	153	127	137	139	232	237	246	221	190	208	183
HOGANALY								**13**			**25**
HOGFUT	56	49	43	74	107	109	119	99	89	86	123
HOGINV					**15**	**1**		**16**	**1**		**28**
HOGS											2
HORT						2	29	12	16	4	5
INTEREST					35	2	18				
INVENTCM						1					
JAZZ										1	
JULYGRAIN				14							
JUNGRAIN		1	12								
KANHAY	**11**	**15**	**20**	**8**	**24**	**20**	**19**	**18**	**10**	**10**	**4**
LAMBS	5					5	19	3			9
LIVEC	59	67	74	107	151	119	119	122	144	153	113
LIVEO	45	25	29	42	61	59	57	49	74	78	64
LIVESTOC							25	61	55	57	28
MALTBARLEY											9
MARKETS	24	12									
MAYGRAIN	8	12									
MEAT	1						11	2			12
MILLOAT										2	1
MIMILK ¤ 3/								**5**			**1**
MKTINFO										17	
MOHOG ¤								**10**	**7**		
MPLSCASH	70	53	56	76	141	161	233	232	201	209	226
MPLSFUT	79	50	62	71	140	140	189	221	177	174	163
MTGRAIN										83	131
MTINFO										45	19
MTLIVE								3	199	137	153
NEBGRAIN						**73**	**81**	**46**	**10**	**40**	**44**
NEBHAY	**32**	**30**	**42**	**14**	**34**	**59**	**76**	**36**	**45**	**40**	**30**
NEBLIVE					**66**	**102**	**92**	**62**	**34**	**46**	**44**
NEBRASKA						3					
NEWPUB							6	16	14	6	13
NOVGRAIN							4	26			
OILSEEDS		1				8	61	39	28	36	20
OKANALYS ¤									**6**	**9**	
OCTGRAIN							29				
OKBEEF ¤						**11**	**6**	**5**	**4**		
OKHOG ¤								**7**			
ONIONS									3		
PORK			**11**	**30**	**44**	**68**	**41**	**47**	**63**	**47**	**52**
PRICES	44	41	54	66	58	71	91	78	77	63	67
RANCHADV	10	8	4		10	12	11	13	19	9	6
RANGES	8					2	6	1			
SATELLIT							1				
SEPGRAIN						28					
SHEEP								10	9	9	12
SHEEPREVIEW								**3**	**41**	**37**	**43**
SOYBEANP							13	13	16	41	29
SOYBEANS						7	1				
SUNFSEED											18
SWINEADV	18	11	9	22	17	9	17	27	28	16	23
TOBACCO						1	9	5	7	3	1
TXBEEF ¤							**9**	**3**			

USCROPSU							14				
USEXPORT								35	60	79	68
USSUPPLY						13					
USWHT	19										
USWTHRSU							7				
VTMILK #								**5**	**1**		
WCROP	20										
WEATHER								1	3		
WHEATPRI										11	26
WHEATPRO							20	33	27	30	21
WHEATRYE								14			
WHITEWHEAT					16	1					
WISMILK #							**5**	**6**	**4**		**2**
WLMIPANA #									5	13	
WORLDSUP						9					
WYBEEF #			**4**	**5**							
TOTALS	1309	1065	1252	1433	2338	2739	3378	3261	3461	3620	3414

1/ Files were available only during months when information on retreivals is noted.

2/ Files in bold were a direct result of this study.

3/ Files marked with "#" were downloaded from COIN and uploaded to AGNET.

In addition to providing information for its current market value, most of the information included in the price files are captured by the computer and put into historical data files. By building such a data bank, files are in place for retrieval by the user in various programs for management and marketing decisions. Most of the captured information is already available for use in various retrieval and charting programs. However, the area of retrieval programs for AGNET market information is still an area that can stand substantial development.

In an effort outside the scope of this study the Foreign Agriculture Service of USDA has begun using AGNET MARKETS as a main avenue for distribution for much of their information. The response from users to the FAS information has been very enthusiastic, and several new users have subscribed to AGNET to receive the FAS information.

The addition of market news and other information on AGNET will be a continuing process. Feedback from participating county agents and producers during this pilot study resulted in several files being added. Additional feedback in the final end user evaluation points to the need for even more types of files.

Market information that is currently being placed on AGNET is being placed almost exclusively by "volunteer" labor. That is, relatively little money is allocated to staffing explicitly for placing market information on AGNET. Several staff hours weekly are being devoted from numerous offices to place the information on AGNET.

By relying so heavily on manual labor to provide the information to the computer network, costs are magnified and the chances for errors arise. USDA Extension Service is working with Agricultural Marketing Service for direct electronic transfers of market information from AMS to the AGNET computer. If such a system could be put in place, cost savings for staff time would be tremendous and the timeliness of the availability of the information could be much improved.

Objective III: Improve the documentation of marketing information and other pertinent information on AGNET and make it available to producers.

One of the developments coming out of this pilot study has been an AGNET Market Information Users Guide. The guide is intended to be just that, a guide to help the new user know what type of market information is available and how to access that information. In addition to documenting the market information, management decision tools are also referenced in the guide with a brief explanation of how to access and use those tools.

AGNET is a very "user-friendly" computer system. The major part of any documentation needed by the user is accesible directly from the computer with the use of "HELP" commands built into the system. Such HELP commands are unique to AGNET. Consequently, most of the needed documentation and aids are available at any time during a terminal session and preclude the neccessity of having a manual available for reference while the user is online.

Objective IV: Improve the drought information and drought management decision making capabilities of AGNET.

The widespread drought in many major cattle producing regions during the summer of 1980 pointed out the need for a network to distribute drought information quickly. In addition to weather information, availability of pasture and hay supplies and the impacts on livestock prices from distress selling was needed. WLMIP piloted some work during the summer of 1980 to enhance the system to help users gain updated information and alternative scenarios to use in their management decision processes during periods of drought.

With the widespread summer rains in 1981, the system was rarely used for exchanging drought information. However, the system is in place whenever any drought situations occur. The system is multifaceted in its ability to transmit drought information. For instance, there is a "drought hotline" that enables the transfer of high priority drought information. This hotline has users at all levels from producers to the Office of the Secretary of Agriculture in Washington, D. C.

Another facet of the drought information and management decision process that was a direct result of this pilot study is a drought section in an AGNET program called "GUIDES." The GUIDES program has information of a general application nature, such as how to best fertilize mountain ranges in dry years, how to best schedule irrigation water, how to budget for purchasing feed versus selling of livestock, etc. GUIDES information is available on the computer for up to 120 days after it is initially put on.

The third aspect of the drought information/management network on AGNET is the use of MARKETS and NEWSRELEASE programs to make compiled information available to the public. This information is used by a wide spectrum of audiences from producers to agricultural media to public decision makers and others. The Nebraska Climatology Committee reports were placed on AGNET after every meeting in an effort that was outside the scope of this project, but an effort that is representative of the type of information that can be networked effectively on a mainframe computer network.

In summary, although the system was not used much during the 1981 season since the need for drought information rarely occurred, the system is in place and can be activated instantly to provide a complete drought information network. WLMIP will continue monitoring drought developments and will coordinate efforts in that area as such times they are pertinent.

Objective V: Develop a mechanism for providing access on AGNET to citations of research based publications relating to specific management problems.

This objective of the study was initiated at the request of Technical Information Systems of the previous Science and Education Administration. The philosophy behind the objective was to make information with a research base available to producers on topics that may be of interest to them in their marketing and management processes.

Investigations were made into the National Agricultural Library of USDA to see if literature citations on the Lockheed Computer Network could be retreived via AGNET. We concluded that the methodology involved in doing NAL searches was rather detailed and involved, and would be much too cumbersome for the general AGNET user to attempt. Not only are the searches themselves difficult, but the output from the search is often extremely hard to interpret.

Thus, not much progress was made in actually placing citations of research based publications on AGNET. However, search-type software is readily available on the system and is used for such things as locating hay and microcomputer programs. The same search procedures could be readily adaptable to providing information pertaining to publications in all the states of the western region. More work will undoubtedly be done in this area in the future; however, limited resources likely will be allocated to this until a demand is documented for the same from AGNET end users.

Objective VI: Evaluate the effectiveness and efficiency of this new delivery system in providing useful information to farmers.

The next chapter will be devoted to an end user evaluation of this study.

CHAPTER III - END USER EVALUATION

The study tested two methods of delivery of market information. The first method was actual direct delivery to farmer-owned microcomputers or computer terminals located on the farm or ranch. The second method tested was "wholesaling" market information through county agents or trained agricultural professionals. These agricultural professionals used marketing bulletin boards in the county agent office or financial institution center, and frequent mailings of market information from these offices to selected producers in their area. This course of delivery was used mainly to acquaint producers with the type of information which could be obtained from the computer network, and test their responses to see if the information delivered this way was useful. The authors were also interested in seeing whether, after receiving the information in this manner, producers would be more interested in obtaining their own computer hardware for direct delivery of the information.

Evaluation of Users Directly Accessing Information

The evaluation forms sent the producers who were directly accessing the information from their own hardware is enclosed as Appendix B to this report. Evaluation forms were returned from 12 direct access users. It should be noted that this group is a representative subset of farmers and not all AGNET users.

Users were asked to evaluate six general types of market information they could access from the computer. The results of that evaluation are listed in the following table:

EVALUATION BY DIRECT USERS

INFORMATION	VERY USEFUL	SLIGHTLY USEFUL	NOT USEFUL	NO RESPONSE	TOTAL
Futures Prices	3	4	1	4	12
Cash Prices	5	3	1	3	12
Commentary & Interpretation	6	3	0	3	12
Newsreleases	2	5	1	4	12
Retrieval Programs	3	2	1	6	12
Conferences	1	4	0	7	12

The files that contain commentary and interpretation of factors influencing the market were very well received by the users who were accessing directly. Various comments received on this question included: "good insights," "comments really helped to get a feel for the market," "more of this type of information needed."

The files on various cash prices were also very well received by the users who were directly accessing the information. AGNET is very unique in that several files contain localized information for various areas within a state that is not available anywhere else in a condensed summarized form. Comments included such things as: "we need more local prices on the

system," "used these the most," "often AGNET is the only source of this information," "excellent."

The files on futures prices were not perceived by the end users to be as useful as the two previously discussed categories. One of the main reasons for this is that AGNET only offers the futures opens and the futures closes. Producers who are active at all in the futures markets find that they need more current quotes which they obtain from their farm radios or from their brokers. Also, not many producers use futures. Some comments along this area included: "would be better if we had a detailed report on weekly futures price movements," "information didn't fit our area completely as there were no sugar futures," "out of date by the time the producers really need this information," "useful if picked off daily."

The retrieval programs were not used as heavily as the authors hoped they might be. One of the main reasons is that perhaps the users did not feel they were sufficiently versed in the correct technical aspects to use the program. Typical comments for this information included: "did not use," "what are these?" "we need a lot more information on how to run these programs," "I liked these very much and accessed them regularly."

NEWSRELEASE items were also not rated very highly by the end users. This was not too surprising as the NEWSRELEASE program on AGNET is generally considered to be more consumer orientated, although there is much good useful information for livestock and grain producers. Typical comments included: "very few used," "checked only on occasional basis," "some good, some bad," "especially liked to the ones on economic issues," "some were excellent."

The lowest rated information source by the end users was the electronic CONFERENCES. Again, this was not too surprising. CONFERENCES are of more use to people other than farmers. It is the responsibility of an individual AGNET user to hook himself up or unhook himself from the electronic CONFERENCES. Although the authors had sent out the procedure for doing this via U.S. mail, it is doubtful that many of the users took the time to go through the procedure to hook themselves up to the CONFERENCES. Typical responses included: "did not use," "so what?" "helped sometimes," "need more information on how to use," "not enough conferences sales or prices."

The users were asked to evaluate the timeliness of information delivered by AGNET. The responses broke down as follows:

Very Timely	Average Timeliness	Too Late to be Useful	No Response
5	5	1	1

The users who were paying their own computer costs had a very high expectation of when the information should be available on the computer. Many times the information for a given day would not be available until the following morning, due to the manual transfer of the information onto the system. Once again, this points out the high desirability of automatic linkages with the AMS teletype system so that the information would be available much more quickly. Typical responses to this question included:

"most information was available from other sources at lower costs like newspapers and radio; however, this service shines in the fact that information is available on demand." "Many times it is hard to check information everyday. Why not put on a program that records daily futures prices information and then on Friday evening we could pull them off for our records."

Users were asked to report costs. Very few had kept records of their costs but those that did report indicated around $50 to $75 a month was a normal combined telephone and computer cost for accessing the AGNET information. A good share of the users responded that they did take advantage of nonprime time telephone and computer costs by calling early in the morning or late in the evening.

Only three users indicated any problems arising from trying to access the information on AGNET, and indicated that a workshop on operating technique would have been helpful. Most indicated that they felt it was quite easy to use the system. However, six respondents indicated that a workshop on how to apply the information being received from AGNET would be extremely useful.

Users were asked to give suggestions for improving AGNET delivery of market information and whether they felt it was worthwhile to continue providing information across the system. Most of the respondents who indicated that additional information would be desirable were looking for more localized cash prices and more commentary with specific projections of what the markets will do in the future. The overwhelming response was that the direct delivery of market information was extremely worthwhile and the project should be continued. Only two users indicated that they did not intend to continue accessing AGNET information regularly.

Although very few respondents put a dollar value on the information received, the majority indicated that the cost-benefit ratios for accessing the information were highly favorable.

Evaluation from "Indirect" Users

Evaluation forms were returned from 37 producers who had received the information from their county agent or ag lender through the U.S. postal system. These users evaluated the information as follows:

EVALUATION BY INDIRECT USERS

INFORMATION	VERY USEFUL	SLIGHTLY USEFUL	NOT USEFUL	NO RESPONSE	TOTAL
Futures Prices	12	20	4	1	37
Cash Prices	14	17	2	4	37
Commentary & Interpretation	13	16	1	7	37
Newsreleases	9	16	1	11	37
Retrieval Programs	9	10	2	16	37

Surprisingly, the users who got the information a few days late through the mail still rated the information on a whole to be useful. Once again, as in the case of the users who had received the information directly, the highest value was placed on the cash prices and the commentary files.

Even more suprising, 5 of the 37 users still evaluated the information as being very timely, and 23 evaluated it as having average timeliness compared with other sources of the information. This tends to indicate that the producer who has not yet invested in his own computer hardware may have a lower expectation in regards to the timeliness in receiving information as contrasted to those who are paying for that information "on demand."

When the users who had received the information indirectly were asked if they had considered purchasing their own computer hardware to access the information directly, 23 of the 37 responded that they either already had or would in the near future be investing in computer hardware. A large number indicated that one of the prime reasons for getting the computer would be to get market information.

However, a large group of these indirect users still look at other methods of technology as being better for receiving market information. A number indicated the desirability for a call-in tape recorder that they could access in the evenings that would give them a wrapup of the day's information. Others felt that farm radios and magazines were sufficient in delivering timely information. Still others responded that they felt they were not "smart" enough to know how to use a computer to help them in their farm or ranch enterprise.

CHAPTER IV - SUMMARY

The need for better information to be used by agricultural producers in making agricultural marketing decisions has been well documented. The thrust of this study has been to evaluate the feasibility of direct electronic delivery of this needed market information. The development of mechanisms for direct producer access to AGNET via farmer-owned microcomputers and computer terminals was one of the main objectives.

The best evaluation of this project lies in the tremendous increase in retrievals of market information. During the time period of the study there was over a three-fold increase in the number of times that AGNET was accessed for market information.

Of the cooperators in this study, nearly three-fourths accessed AGNET through the use of microcomputers, while the remainder used dumb terminals for communication. It was found that operating a microcomputer in an intelligent mode with AGNET becomes increasingly desirable due to the tremendous potential in telephone cost savings. Savings of 50% or more resulted from using microcomputers in this manner. It is relatively easy to turn a microcomputer into a dumb terminal for communicating with AGNET. It becomes much more difficult, however, to operate in the intelligent terminal mode. This study uncovered software that makes this possible for most brands of microcomputers. The idea of interfacing farmer-owned microcomputers and a regional computer such as AGNET could be one of the most significant thrusts in Extension Service activities for agricultural computer applications in the future.

The pilot study was successful in providing current market news information to AGNET for retrieval by producers and others. A wide variety of new files have been made available in the MARKETS section on AGNET. Many of these files were the direct result of this pilot study. These files and others will continue to be available on AGNET.

Feedback from the final end user indicated the need for several more types of files particularly of a regional type. The timeliness of the market information provided on AGNET was a concern to the producers involved in the study. Although the majority of the participants felt that the material was very helpful to them, they also expressed a desire for more timely information. This end user evaluation points toward a critical need for direct electronic transfers of market information from AMS to the AGNET computer.

WLMIP piloted some work during the summer of 1980 to enhance the drought information network on AGNET. This network is in place and can be activated instantly to provide a complete drought information network. WLMIP will continue monitoring drought developments and will coordinate efforts in that area when necessary.

In summary, this pilot study provided much needed background information on the electronic delivery of market information. This study found that there is indeed a demand for the direct electronic delivery of marketing and management information to farm producers. There exists a

unique opportunity for the Extension Service to assume an even greater role in the delivery of this timely market information. In addition, the study provided the documentation of the need for increased development of computer applications to agriculture in information networking and evaluation of marketing alternatives. This information provides a base from which the Extension Service can evaluate and plan their activities in the computer arena for the future.

Appendix A

COMMUNICATIONS WITH MICROCOMPUTERS
by
Harlan Hughes and Robert Price

Wyoming is now communicating to AGNET with a Pet Commodore and an Apple II Plus on a regular basis as each microcomputer is equipped with a telephone coupler. We simply dial the AGNET computer from the keyboard of the microcomputer. The coupler for the Pet is a TNW488-103 running with a slightly modified PTERM103 software package that collectively cost $540. The coupler for the Apple is a D.C. Hayes and their associated software that collectively cost $300.

Pet

The Pet's PTERM103 software program is a flexible package that allows us to effectively use the Pet as a "dumb terminal" to AGNET. One starts a terminal session by loading the program which we have renamed "AGNET." After loading it you type in RUN and a menu shows up on the screen. The menu is:

ANSWER, CALL, DISPLAY, EXIT, HANG-UP, SET, TEST, USER, CR.

While I will not take time here to explain all of the commands on the menu, there are several command options available. I can call in any of the options by typing in just the first letter of the option name. For example, to call AGNET I just type in a "C." Since it also has the AGNET telephone number stored in the PTERM103 software, I can retrieve the AGNET telephone number by typing in "N1." The software takes over and automatically dials the AGNET computer. From this point on the microcomputer is under control of the AGNET computer and operates just like a "dumb terminal."

The PTERM103 software does allow one to interrupt the AGNET control and return to the PTERM103 menu. This in turn allows the user to turn the microcomputer's printer on or off as desired. This is a very useful feature when using a microcomputer as a terminal with AGNET. With the interactive sessions you often only need hard (printed) copy of a portion of your terminal session. By being able to turn the printer on and off, you save a considerable amount of paper.

Apple

The Apple coupler operates in a similar manner. You first invoke the D.C. Hayes by typing in "IN#3." You then command the modem software with the "Control A." "Control H" puts the modem in half duplex as required by AGNET. A "Control A, Control Q" allows you to dial AGNET. Once AGNET answers, you operate your microcomputer just as if it were a dumb terminal.

While it took a while to discover, we are now able to turn the printer on and off during AGNET sessions. You first must get out of the Apple terminal mode by hitting the "Control A, Control R" and return. This puts

you in Applesoft mode so that you can turn the printer on by a "PR#1." You now get back into Apple terminal mode by hitting "Control A, Control H." You are now printing the output. You can turn the printer off by inserting "PR#0" in place of the "PR#1." We also find that we cannot use the printer on/off routine on the CDC mainframe computer.

Using the Apple as a Smart Terminal

Microcomputers have the power to do considerably more than operate as a dumb terminal to a mainframe computer. With its logic ability, a microcomputer can operate as a "smart terminal" when connected to a mainframe computer. However, a smart terminal software package is required. The authors are aware of three smart terminal packages for the Apple microcomputer. They are:

1. ASCII EXPRESS
2. DATA CAPTURE
3. VISITERM

ASCII EXPRESS

For $60 you can purchase a smart terminal software package for the Apple called ASCII EXPRESS. This software package was developed by Southwestern Data Systems. This program stores the name and phone number for up to 18 separate sets of keyboard macro definitions to help you log on to each specific machine. With just a few key strokes, you can call up and log on to any system.

The ASCII EXPRESS is equipped with a buffer that can be used to capture incoming data (downloading) or to send data up to the mainframe (uploading). Any DOS file can be uploaded including INTEGER BASIC, APPLESOFT BASIC, TEXT, and BINARY files. Utility programs are available to help with the uploading and downloading. A fairly powerful EDIT routine is also part of the package. We find the EDIT routine very useful.

AGNET Wyoming has ASCII EXPRESS and we find it very useful. It has opened up several doors to information networking that we are presently using on AGNET. We are uploading ELECTRONIC MAIL, NEWSRELEASES, and MARKETS information on a regular basis. We are downloading information from the COIN system and uploading that information to the AGNET computer.

DATA CAPTURE

Southeastern Software sells a smart terminal package called DATA CAPTURE for $65 (eighty-column versions sell for $90). This program also operates with a buffer that is used for uploading and downloading. It has a unique feature of a buffer status line with a continuous display telling you at a glance how many lines have been captured in the buffer. It will also automatically save the buffer on disk whenever it fills up. AGNET Wyoming does not have the DATA CAPTURE program, but we have used it briefly on someone else's micro as a dumb terminal and it was easy to use. The EDIT program appears to be very limiting.

VISITERM

VISITERM is a part of the new software series from Personal Software. VISITERM costs $129 but has many innovative features that make it a very flexible smart terminal package. VISITERM allows a wide range of protocols for sending text. Programs can be sent after the usual conversion to TEXT files. VISICALC-generated files can also be sent with VISITERM.

AGNET Wyoming has briefly tested this package and found it has one major limitation. We could not print the output while receiving it from the mainframe. We consider this unsatisfactory as a communications package.

Communications with CP/M Operating Systems

WLMIP is now communicating with AGNET using a Vector equipped with the D.C. Hayes Micromodem 100 and associated software. The cost for the package is approximately $500.

The Hayes software is invoked by typing "MM100." The commands in the Hayes software are invoked by doing a "Control A." This allows you to set duplex to half, make parity settings, dial the computer and other necessary commands.

The standard Hayes package does allow the CP/M microcomputer to operate in the dumb terminal mode with AGNET. However, it does not support features to allow uploading of data files.

The MM100 for CP/M operating systems is equipped with a command invoked by typing a "Q" which allows the user to turn the printer on (Q1) or off (Q0) at any time during the terminal session. There is also a capture buffer that allows you to download information from a mainframe and capture it on a disk file in the microcomputer. This capture buffer can be turned on and off at will during the terminal session. However, it does not automatically write to disk when full but instead empties itself and begins capturing over again at that point.

CROSSTALK

After testing several intelligent terminal packages without much satisfaction, WLMIP is currently using a communications package called CROSSTALK developed by Microstuf, Inc. from Decatur, Georgia. The CROSSTALK package for the D.C. Hayes modem sells for $150, and is a very flexible communications package. Command files can be built and stored which contain all the necessary information for duplex settings, telephone numbers, etc. needed to access a given computer. We renamed the CROSSTALK program to CALL. By simply typing "CALL AGNET" the program automatically searches for the correct file, makes the necessary machine settings, and dials the telephone number. The next thing that we do is logon the AGNET computer. In the same method, we also have a file named "COIN" and by simply typing "CALL COIN" we can access the COIN computer.

The number of these command files that can be developed is limited only by disk storage space. This gives a tremendous amount of flexibility in accessing a number of different remote computers.

We can upload files using the CROSSTALK communications package. However, instead of checking for the "reader on" prompter message sent by AGNET, the software has a one second delay built in. It waits for one second and then sends the next line of the file to the host computer. This works satisfactorily for uploading files, but does not allow the stacking of program instructions.

CROSSTALK has a number of features built in for capturing data files and writing them to disk, turning the printer on and off, and other very useful functions for communications packages.

Montana State University Software

The authors are aware that the Microcomputing Laboratory at Montana State University is developing some fairly sophisticated communications software for CP/M operating systems. We have not yet had the opportunity to test the packages, but feedback from users that have worked with the software has been very favorable. WLMIP is working with a programmer in the Computing Laboratory at Montana State in developing a complete package for CP/M and the Hayes Modem which will allow AGNET sessions to be conducted without operator intervention. Our goal is to do most of our work with AGNET in the middle of the night when telephone costs and computing charges are half of what they are during prime time. When this software is in place and fully tested, it will be available for other users. The economic incentive for midnight terminal sessions is quite high.

Information networking is rapidly becoming the wave of the present. Microcomputers equipped with telephone couplers turn a micro into a logical device to access information networks. We estimate that uploading and downloading can reduce telephone time by 30-50 percent. The economic incentive to develop some top quality communication packages is very high.

&name&
&ranch&
&address&
&city&

EVALUATION OF AGNET MARKET INFORMATION

1. What information did you access?

   Daily_____

   Weekly_____

   Monthly_____

2.

INFORMATION	VERY USEFUL	SLIGHTLY USEFUL	NOT USEFUL	PLEASE COMMENT
Futures prices	___	___	___	_____
Cash commodity prices	___	___	___	_____
Commentary and interpretation(ie. Catfut, Grainreview, etc.)	___	___	___	_____
Newsrelease items	___	___	___	_____
Retrieval programs (ie. Priceplot, Marketchart, etc.)	___	___	___	_____
Conferences	___	___	___	_____

3. How would you rate the timeliness of the information received on AGNET?

   Very timely____ Average timeliness____ Too late to be useful____

4. What suggestions do you have for improving the information delivery on AGNET? What information would be useful that was not available?

5. What dollar value (monthly) would you place on the information to your farm or ranch business? Please cite specific instances where the information was beneficial.

(OVER)

6. What were your telephone and computer costs per month?

	July	Aug	Sept	Oct	Nov	Dec
Telephone costs						
Computer costs						

7. If your costs varied substantially from month to month please explain why?

8. What time of day did you normally call AGNET? Did you take advantage of non-prime telephone time?

9. Do you feel that this project is worthwhile and should be continued? Please explain.

10. Did you have any major problems accessing the AGNET system? Would an initial AGNET computer workshop on operating technique have been helpful? Would an AGNET workshop on business applications have been helpful?

11. Please share any additional comments you may have on computer delivery of market information.

Please Sign Here _____

EVALUATION OF AGNET MARKET INFORMATION

1. What information did you receive?
   Daily_____
   Weekly_____
   Monthly_____

2.

INFORMATION	VERY USEFUL	SLIGHTLY USEFUL	NOT USEFUL	PLEASE COMMENT
Futures prices	___	___	___	_____
Cash commodity prices	___	___	___	_____
Commentary and interpretation(ie. Catfut, Grainreview, etc.)	___	___	___	_____
Newsrelease items	___	___	___	_____
Retrieval programs (ie. Priceplot, Marketchart, etc.)	___	___	___	_____

3. How would you rate the timeliness of the information you received?

   Very timely____ Average timeliness____ Too late to be helpful____

4. Have you considered investing in your own computer hardware to enable you to access market information directly?

5. What suggestions do you have for improving the delivery of market information to you ? What information would be useful that was not available?

6. Do you feel that this project is worthwhile and should be continued? Please explain.

Name_____
Address_____
City, State, Zip_____