

October 18, 1993

# LCMR FINAL STATUS REPORT 1991 Energy 15

## I. PROGRAM TITLE: Agricultural Energy Savings Information

Program Manager: Patricia Hung  
Agricultural Utilization Research Institute  
23 Empire Drive, Suite 186  
St. Paul, Minnesota 55103  
(612) 223-8378

### A. M.L. 91, Ch. 254, Art. 1, Sec. 14, Subd. 13 (d)

Appropriation:	\$150,000
Balance (October 18, 1993):	\$ 20,319

(Final financial report to follow upon receipt of all invoices, expected first full week of Oct. '93)

This appropriation is to the commissioner of administration for a grant to the Agricultural Utilization Research Institute (AURI) to conduct a series of conferences, communication products, and intensive workshops in order to transfer the results of state-funded research to agricultural practitioners.

### B. Compatible Data: not applicable

### C. Match requirement: none

## II. NARRATIVE: The AURI is planning an aggressive effort to distribute current information on energy reduction technologies and sustainable agriculture methods to agricultural consumers throughout Minnesota. The AURI will consolidate results from more than 30 agricultural energy savings projects funded by the Institute with information from a variety of other state-funded experiments. Low-input technologies are just beginning to gain acceptance in the mainstream agricultural community. The AURI intends to accelerate that acceptance through conferences, workshops, and other technology transfer efforts including the statewide distribution of an agricultural energy savings resource manual.

## III. OBJECTIVES

### A. Compile the results of Agricultural Energy Savings Program (AESP) projects. Conduct technical reviews on project results.

A1. NARRATIVE: In 1989, the Agricultural Energy Savings Program funded 23 research and demonstration projects with timelines of up to three years. A final round of grant selections will be completed by the end of 1990. The projects, which have timelines of up to three years, are required to submit quarterly and final reports. The AURI will collect narratives, technical data and other information from projects and assign final reports to various technical reviewers according to their expertise. The reviewers will assess the validity of the results and determine how project results should be categorized for a final consolidated report.

A2. PROCEDURES: Final project reports will include research objectives and results, methods and materials, energy saving data, analysis of environmental and economic impact, technology transfer procedures, financial reports, and other relative information. Each project will also submit a narrative, summarizing results and applicability to Minnesota farms, intended for publication. Technical reviewers, national and state experts from fields such as agronomy, soil science, plant pathology, entomology, ag engineering, animal science, and ag economics, will assess the projects' research methodology and results. Projects will be labeled as "research" or "demonstration" and categorized as to regional or statewide applicability of the results, farm segments to be targeted, and agricultural production areas addressed by the project. In addition, reviewers will critique the narratives prepared for publication.

A3. BUDGET: \$ 10,000 BALANCE : \$7039

### A4. TIMELINES FOR PRODUCTS/TASKS:

Round one projects (completed by 7/93):

Compile results	6/93 - 8/93
Conduct technical and narrative reviews	8/93 - 10/93

Round two projects (completed by 11/93):

Compile results	11/93
Conduct technical and narrative reviews	8/93 - 10/93

Round three projects (completed by 11/93):

Compile results	11/93
Conduct technical and narrative reviews	8/93 - 10/93

### A5. STATUS: Reported October 18, 1993

A comprehensive database of all currently available information, including preliminary findings from many of the unfinished reports, has been created. Because a number of projects have been granted extensions or are delinquent in their reporting, it has been difficult to collect all needed information within the proposed timeline. Once all the results are in and summarized, a very strong case for the economic as well as environmental soundness of energy-reducing strategies should be present. Additionally, findings that have been scrutinized by the scientific community for validity will be more convincing to the general public, who will then be more likely to endorse/adopt the corresponding practices.

Due to time constraints, the database has yet to be fine-tuned so the information contained within can be easily accessed and updated. However, it is AURI's desire to complete this work. We are preparing a proposal to the Department of Administration to allow us to do so (detailed in section C5) with money from the Agricultural Energy Savings Program. After that, AURI anticipates updating the database on an on-going basis, and making it available to the public.

As reported in section A5, a comprehensive database has been created which includes a list of addresses, project titles and summaries of all Minnesota organizations involved within the last five years in agricultural energy-reducing projects. Collecting technical project data proved to be a formidable task. AURI is preparing a proposal to the Department of Administration which would allow us to develop this database further .

A6. BENEFITS: A technical assessment of AESP project results is important to disseminating information that is accurately labeled and validated. While all project results will provide important information to farmers, statistically significant, quantifiable and repeatable should be classified differently than demonstrations, which might include confounded data. Complex technical data will be summarized in the published narratives to maximize utility to the audience.

B6. BENEFITS: Consolidating information on agricultural energy savings projects fosters cooperation among agencies, thereby lessening confusion and overlap in information distributed to farmers. The result will be comprehensive, valuable resource materials for Minnesota farmers and other agricultural interests.

**B. Compile results of other, related projects funded by state organizations, including the Legislative Commission on Minnesota Resources.**

**C. Prepare project results for publication.**

B1. NARRATIVE: The AURI intends to include information on as many agricultural energy savings projects as possible in its information distribution plans. Research and demonstration projects, similar in content to AESP projects, that have recently been funded by the LCMR, Minnesota Department of Agriculture (MDA), University of Minnesota, and other entities will be included to the greatest extent possible.

C1. NARRATIVE: After completing project reviews, design a final consolidated report to serve as a well-organized, hands-on resource manual for farmers. Others targeted for access to the manual will include agricultural consultants and researchers, lenders, state and local agricultural agencies, organizations and businesses. The manual will first be distributed at conferences to be held in rural Minnesota in March, 1992. Similarly, an updated manual will be distributed in March and April 1993.

B2. PROCEDURES: AURI representatives will meet with program managers from various agencies to develop a coordinated plan for collecting technical project data. With the assistance of cooperating agencies, the AURI will facilitate technical and narrative reviews of the projects in a manner similar to the AESP review process. In addition, the group will design a narrative report form for individual project investigators to complete for a consolidated publication.

C2. PROCEDURES: The manual will segregate project results into categories such as animal waste utilization, tillage, soil nutrient management, non-chemical weed control, etc. The material will be cross-referenced in such areas as targeted farm segments, regional applicability, etc. Introductions and summaries will be written to compare and link results of similar projects.

B3. BUDGET: \$ 5,000 BALANCE : \$2039

C3. BUDGET: \$58,000 BALANCE : \$9637

**B4. TIMELINES FOR PRODUCTS/TASKS:**

**C4. TIMELINES FOR PRODUCTS/TASKS:**

**Preparation for 1992 manual and conferences:**

Meet with various agencies to plan efforts	(2/91)*
Design narrative reporting format across agencies and assess technical report format compatibility	(3/91)*
Compile results of various projects	(4/91 - 6/91)*
Conduct technical and narrative reviews	7/91 - 8/91

**Preparation for 1993 manual and conferences:**

Compile results of various 1992 projects	2/93 - 6/93
Conduct technical and narrative reviews	2/93 - 6/93

B5. STATUS reported October 18, 1993:

1992 Manual, 75,000 copies:	
Design manual	7/91 - 11/91
Edit project narratives	6/91 - 12/91
Write & edit introductions, summaries of findings, & other consolidated information	11/91 - 1/92
Edit, typeset, layout and print publication	1/92 - 2/92
1993 Manual, 8000 copies:	
Redesign manual	12/92 - 10/93
Edit project narratives	2/93 - 2/94
Write and edit introductions and summaries	4/93 - 2/94
Edit, typeset, layout and print publication	3/94 - 5/94

C5. STATUS reported October 18, 1993:

The original intent to publish a resource manual in 1992 was scaled back due to limited amounts of information. Instead, AURI and the MDA worked together to produce a special 32-page, full-color insert for *Farmer Magazine* which highlighted agency-sponsored as well as LCMR-endorsed projects. The insert generated positive responses and approximately 1000 requests for copies. Additionally, both agencies and individuals highlighted in the insert received numerous inquiries, indicating a need and desire to know more about agricultural, energy-reducing practices.

Norman Senjum, former Managing Editor of *Farmer Magazine* and *USAgriculture*, was contacted as a potential contractor to edit and layout the 1993 manual. In order to be truly effective and to meet the stated objective, he felt the research project information needed to be presented in a way that farmers could implement it as a part of a complete farming system. To achieve this objective, Mr. Senjum proposed presenting the results in a comprehensive package. This communications package can separate into stand-alone units tailored to a defined audience's needs. More specifically, it consists of: a) a series of modules for farmers that will present research findings in the context of farming systems adopted by participating farmers; b) a white paper for legislators and policy makers that presents findings in the context of the likely course of farmer-led innovation, barriers to the adoption of desirable farming practice, and the role of public policy in encouraging energy-savings, sustainable development of agriculture and rural economies; and c) a source book for change agents that presents findings of complete farming systems and a comprehensive list of energy-saving practices. The source-book will also describe how groups of farmers succeeded in pooling their experience to solve practical farming problems. Due to the extended timeline however, his proposal was not approved.

Instead, the LCMR Commission approved a scaled back version with the understanding that AURI should try to fund the rest of the proposal through other sources. Because Mr. Senjum has taken on a new job, he has handed the majority of the work over to another former employee of *The Farmer Magazine* and *USAgriculture*, David Hest. Mr. Hest has handled the project admirably, and AURI has seen no lapses in the execution of the plans. The completion of the scaled back version is significant because it creates a very solid foundation upon which the rest of original proposal can be built. Additionally, during its synthesis it became apparent that this could very easily expand beyond the bounds of the original proposal to become a definitive depository of information for the future direction of Minnesota agriculture. It consists of two (out of the original five) modules, recommendations for publication of those modules, and a suggested outline for the source book that is easily adaptable to a hardcopy or database format (copies included with this report).

Due to scaling back of this proposal, the amount of money spent on the creation of this version is less than originally budgeted for. As a result, a portion of the grant will be turned backed to the LCMR Commission as soon as all related invoices are paid out.

As reported in section A5, we are preparing a proposal to the Department of Administration to complete the 1993 manual as originally envisioned by Mr. Senjum. The proposal will also ask to create a video to correspond with the white paper. This proposal anticipates using money

remaining from the Agricultural Energy Savings Program grant. Because this LCMR project is a direct outgrowth of the Agricultural Energy Savings Program, we believe that this proposal is an appropriate expenditure of this money and therefore has a good chance of receiving approval. If approved, it is anticipated the completion date will be mid-1994.

The result will be a comprehensive report in which farmers can readily see how the results can be integrated into a farming operation. Policy makers can readily see the direction in which agriculture needs to change in order to be less dependent on external energy sources and more "sustainable" in other respects as well. Change agents can better understand the context in which farmers are likely to utilize the information generated by research as well as information available from other sources.

C6. BENEFITS: A user-friendly resource manual on agricultural energy savings techniques gives farmers access to current information on sustainable agriculture and energy savings techniques. Cross-referencing allows farmers to quickly locate information pertinent to their own farm management systems.

D. Conduct conferences for farmers on energy savings methods in agriculture.

D1. NARRATIVE: The AURI will conduct four conferences in various agricultural regions of the state in 1992 and four in 1993. Informational booths will be set up by project investigators and cooperating farmers. These booths will include visual displays and information on projects as well as space for individual consultations with farmers. Conferences will also feature keynote speakers to address specific topics in sustainable agriculture and energy savings. The AURI will work cooperatively and in co-sponsorship with state and local organizations, such as experiment stations, to plan and implement the conferences.

D2. PROCEDURES: Conference locations that are central to farmers in each agricultural region of the state, including Northwest, Central, Southwest and Southeast Minnesota, will be identified. With the assistance of co-sponsors, the AURI will contract for facilities, audio-visual equipment, food service, and other conference-related items at each location. Preparations will include planning focus topics and scheduling speakers, designing exhibition areas and assisting project investigators in designing informational booths and, finally, designing and implementing regional advertising campaigns for the conference. Publicity vehicles will likely include newspapers, broadcast media, farm magazines, newsletters, and such organizations as Minnesota Extension Service.

D3. BUDGET: \$77,000 BALANCE : \$1722

(a) Conference Expenses:

'92	34129
'93	56804
subtotal (a)	\$90933

(b) Conference Revenue:

'92	MDA	(8000)
	Registrations	(910)
	Interest	(2416)
'93	Registrations	(1887)
	Interest	(2442)
subtotal (b):		(\$15655)
subtotal (a):		\$91050

TOTAL Conference Expenses(a+b):	\$75278
Budget Allowance:	\$77000
BALANCE:	\$1722

D4. TIMELINES FOR PRODUCTS/TASKS:

Four 1992 conferences	3/92
Identify locations and exhibition design	(4/91)*
Contact local organizations for co-sponsorship	(5/91)*
Contract for facilities, equipment, services	7/91 - 8/91
Notify project investigators of plans	8/91
Work with investigators to design displays	12/91 - 1/92
Select focus topics and speakers	8/91 - 9/91
Design and implement advertising campaigns	8/91 - 3/92
Manage conference details	12/91 - 3/92
Four 1993 conferences	3/93 - 4/93
Conduct conference planning as itemized above	4/92 - 4/93

D5. STATUS reported October 18, 1993:

Exit surveys and personal interviews showed that conference participants were extremely pleased with the overall quality of the conference. Equally important, most were able to take home some useful, applicable information for their farm operations. The numbers of participants at the 1992 "Agricultural Choices" conferences were lower than originally predicted. After careful scrutinization of design and execution of the "Agricultural Choices" conferences, the 1993 conferences were redesigned and aggressively marketed. The "Pay Dirt Exchange" had more sponsoring organizations, more media publicity, more conference consultants, more planning time, and more defined topics. Attendance was up from the previous year. Again, among those

that did attend, exit surveys and personal interviews indicated a very high degree of satisfaction with the program, with a number of individuals claiming they were going to make positive changes in their farm management practices because of something they learned there. AURI is extremely pleased with the "Pay Dirt Exchange" concept and intends to use it to promote related activities. This includes naming the resource manual "Pay Dirt." It is also planned that AURI and other organizations will continue to conduct "Pay Dirt Exchange" conferences on a regular basis, changing the topic area as appropriate.

D6. BENEFITS: Farmers will have the opportunity to attend a conference in their area which addresses many topics in agricultural energy reduction. They can select the exhibitions and group sessions they are interested in, rather than sitting through a long list of speakers. Participants may attend just to obtain information or to explore specific practices with project investigators. Agricultural researchers, as well as producers who have conducted on-farm experiments, will be on hand for discussions with farmers.

IV. EVALUATION

The most direct, tangible measurement of the success of this program will be the number of agricultural consumers who receive useful information on energy-saving agricultural practices through these strategies. The AURI expects to distribute almost all of the first and second editions of the resource manual to farmers, lenders, ag consultants and businesses, state and local agents, organizations, and other agricultural interests. Attendance at the conferences and workshops is projected to exceed 4,000 participants.

V. CONTEXT

- A. The AURI is not aware of any other statewide technology transfer efforts similar to the approach presented here. Information is currently being distributed through regional field days, meetings, workshops, publications and other means. This project is unique, however, as it pulls together the results of experiments conducted by several state organizations and focuses specifically on energy reduction and sustainable agriculture.
- B. Over 30 projects are being funded through the AURI's Agricultural Energy Savings Program and many others are being funded through the Legislative Commission on Minnesota Resources, Minnesota Department of Agriculture, University of Minnesota and other agencies. The AURI will design a comprehensive plan for reviewing and consolidating information from these projects, designing a resource manual for farmers, and conducting a series of conferences and workshops throughout Minnesota to transfer innovative methods from experimental plots to farms. In addition to the plans presented here, the AURI will be communicating with other organizations on an on-going basis to enhance and enlarge the information distribution strategies. For example, the AURI has contacted KTCA-KTCI television to discuss potential plans for designing an educational video program on sustainable agriculture.

- C. The Agricultural Energy Savings Program was launched in December 1988 by the Agricultural Utilization Research Institute. The AESP, originally funded with \$2 million in oil overcharge funds, fosters research and demonstration of energy-saving techniques that can be transferred to agricultural consumers within a relatively short time span. Projects have been funded in such areas as sustainable agriculture practices, reducing irrigation, energy-savings in poultry and livestock housing, integrated pest management, and other areas. Projects are sponsored by non-profit organizations and post-secondary institutions. The AURI serves to foster collaboration between researchers, farmers, state and local agricultural agencies, organizations, and businesses.
- D. In 1988, the Legislature allocated \$2 million of the Stripper Well Settlement Agreement funds to the AURI to administer grants, not to exceed \$100,000 per grant, for research or demonstration projects that minimize the use of energy in production agriculture. Funds have been routed through the Minnesota Department of Finance. However, the AURI and Greater Minnesota Corporation were not a part of the Biennial Budget System until this year.
- E. Not available at this time.

## VI. QUALIFICATIONS

- 1. PROGRAM MANAGER:  
Patricia Hung  
Agricultural Environmental Specialist, Agricultural Utilization Research Institute

Patricia Hung has a solid background in horticultural practices and considerable experience in managerial and administrative positions. Previous positions include a joint appointment as a Research Assistant for the University of Minnesota, Department of Horticulture, and the Southern Experiment Station at Waseca, as the manager of a hospital laboratory in Thailand while serving in the US Peace Corps, and as a fellow at the USDA - Office of International Cooperation and Development. She has a BA in biology from the College of St. Thomas. She obtained her MS degree in horticulture from the University of Minnesota.

- 2. DIRECTOR:

Richard Nelson, Ph.D.  
Executive Director, Agricultural Utilization Research Institute.

Dr. Nelson is responsible for organizing and directing all aspects of the Agricultural Utilization Research Institute's operation including agricultural research initiatives and technology transfer activities. His extensive experience includes serving as the New Technology Manager for the FMC Corporation, Citrus Machinery and Services Division, as the Director of Research, Development and Technical Services for the Canandaigua Wine Company, and as the National Research Coordinator for Andres Wines, Limited. Dr. Nelson received his B.S. degree from the University of California, Davis. He obtained his M.S. and Ph.D. from Cornell University. His technical expertise is in the area of foods and industrial ingredients and fermentation.

- 2. PRIMARY PROGRAM CONSULTANT:

Dean Fairchild  
President, Agri-Information Services, Inc., White Bear Lake  
Consultant, AURI and Agricultural Energy Savings Program

Dean Fairchild has served as a consultant to the Agricultural Energy Savings Program since September 1989. His responsibilities include reviewing the research methodology and progress of AESP projects, assisting with technology transfer efforts, and serving as a general advisor to the program. Mr. Fairchild's company, Agri-Information Services, offers agronomic and agribusiness consulting. He served as Senior Agronomist and Manager of Agri-Production Services for Cenex and as a Senior Scientist with the University of Minnesota Soil Science Department.

## VII. REPORTING REQUIREMENTS

Semiannual status reports will be submitted not later than Jan. 1, 1992; July 1, 1992; Jan. 1, 1993; and June 30, 1993, and a final status report by Sep. 30, 1993

\* Dates in ( ) indicate AURI funded activities which will start before LCMR funding begins.

# 1991 RESEARCH PROJECT ABSTRACT

FOR THE PERIOD ENDING JUNE 30, 1993

This project was supported by Oil Overcharge (Subd. 13)

<b>TITLE:</b>	Agricultural Energy Savings Information
<b>PROGRAM MANAGER:</b>	Patricia Hung
<b>ORGANIZATION:</b>	Agricultural Utilization Research Institute
<b>LEGAL CITATION:</b>	M.L. 91, Ch. 254, Art. 1, Sec. 14, Subd. 13(d)
<b>APPROPRIATION AMOUNT :</b>	\$150,000

## STATEMENT OF OBJECTIVES:

To accelerate adoption of low-input practices by Minnesota agricultural producers by creating a number of communication products including a series of conferences, which showcase the results of state-funded research and demonstration projects on energy-reducing technologies and sustainable agricultural methods.

## OVERALL PROJECT RESULTS:

A comprehensive database has been created which includes a list of addresses, project titles, contacts, summaries, and in the case of AESP projects, results or preliminary findings. Due to numerous project extensions, collecting all the information within the proposed timeline has been very difficult. Consequently, putting together the resource manual has also been delayed. Norman Senjum, former Managing Editor of the *Farmer Magazine* will tentatively collect additional information as it becomes available. He will create a comprehensive communications package that will separate into stand-alone units, tailored to a defined audience's needs.

Two sets of conferences showcasing energy savings methods in agriculture were conducted in the springs of 1992 and 1993. Exit surveys and interviews showed that most conference participants were very pleased with the overall quality and content of both conferences. A number of individuals claimed that the conferences helped them decide or showed them how to switch their farming practices to more sustainable methods. The planned follow-up workshops were not conducted because of low attendance numbers at the "Agricultural Choices" conferences of 1992, and "Pay Dirt" Exchanges of 1993. Additionally, for the "Pay Dirt" Exchanges, the topics of interest required planning that involved setting aside fields back in the previous December or January. At that time, we had no indication that these topics were to generate the most interest, therefore no fields were set aside.

## PROJECT RESULTS USE AND DISSEMINATION:

The "Agricultural Choices" conferences '92 were held March 10 - The Kahler Hotel, Rochester; March 11 - The Sunwood Inn and Convention Center, St. Cloud; March 17 - Mount St. Benedict Center, Crookston; and March 19 - The Best Western, Marshall. Informational booths of the MN Dept. of Agri. and AURI sponsored projects were manned by project cooperators and cooperating farmers. Speakers addressed specific topics in reduced input practices. The "Pay Dirt" Exchanges '93 were held March 8 - The Best Western, Marshall; March 22 - The Garden Inn, Mankato; March 24 - The Holiday Inn South, Rochester; and March 29 - The Sunwood Inn and Convention Center, St. Cloud. Highlights and results of AURI projects that involved principles of crop residue management were presented. Speakers addressed specific topics in crop residue management.

AURI and the MN Dept. of Agri. worked together to produce a 32-page, full color insert for the *Farmer Magazine* which highlighted agency-sponsored projects. 66,000 copies were distributed. AURI is currently working with Norman Senjum to produce a comprehensive communications package as described above. This will be distributed to farmers, policy makers, legislators, and change agents. Expected completion date is 2/94.