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UNIVERSITY OF MINNESOTA
FARMING SYSTEMS RESEARCH AND EXTENSION
ACTIVITIES and PROGRESS REPORT
March, 1985

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UNIVERSITY OF MINNESOTA
FARMING SYSTEMS RESEARCH AND EXTENSION

Introduction

Farming Systems Research and Extension (FSR/E) is an interdisciplinary program effort at the University of Minnesota with both domestic and international thrusts. The FSR/E program includes faculty and graduate students from a variety of departments and disciplines including agronomy, animal science, horticulture, soil science, agricultural and applied economics, agricultural extension, home economics and family living, anthropology, rural sociology, and education.

The FSR/E program conducts weekly seminars for faculty and students on FSR/E methods, theory, case studies, and related topics. Each month the FSR/E group hosts a visiting expert in farming systems from outside Minnesota.

The FSR/E group has developed a course and seminar practicum in Farming Systems Research and Extension which is cross-listed in the Colleges of Agriculture, Home Economics, and Education. The farming systems group has also undertaken a major domestic farming systems research and extension project in Northeastern Minnesota in cooperation with the Agricultural Extension Service and the Agricultural Experiment Station. This project focuses on small family farms in three Minnesota counties. The research group has conducted an initial farming systems "sondeo" to characterize the farming systems of the area and is in the process of organizing on-farm trials based on this farming systems characterization. Additional community assessment and policy assessments will be undertaken in conjunction with the interdisciplinary agricultural and family assessments

already completed.

The University of Minnesota Farming Systems Research and Extension collaborative group has made a long-term commitment to work at developing effective FSR/E methods which can contribute to interdisciplinary and holistic research and extension efforts aimed at small farmers.

Developing Country Expertise in FSR/E

The Minnesota Farmings Research and Extension group is part of the University of Florida Farming Systems Support Project supported by U.S.AID. Minnesota FSR/E faculty have participated in farming systems support project training and development efforts. In the Summer of 1984 the University of Minnesota hosted and conducted Farming Systems Research and Extension training on behalf of FSSP and U.S.AID. Participants included agricultural personnel and students from seven developing countries in Africa and the Caribbean. University of Minnesota FSR/E faculty have participated in developing, reviewing, and providing technical assistance to farmings systems projects in Africa, Asia and Latin America. The Minnesota faculty involved with the Caribbean Agricultural Extension Project also are working closely with the Caribbean Agricultural Research and Development Institute (CARDI) which is carrying out a major farmings systems project supported by U.S.AID in the Caribbean. Minnesota is involved in a U.S.AID sponsored farming systems project in Burundi including providing long-term technical assistance.

Over 100 faculty at the University of Minnesota are associated with the Farmings Systems Research and Extension collaborative study group, with 20 faculty participating actively. This report summarizes FSR/E activities at the University of Minnesota in 1984/85. In particular, this report will describe progress in the Northeast Minnesota FSR/E Project. We have also

included materials on two University of Minnesota FSR/E courses developed in 1984 and offered for the first time in 1985. However, prior to presenting a description of FSR/E activities, we begin in the next section with a description of the Farming Systems Research and Extension (FSR/E) approach to agricultural and community development.

WHAT IS FSR/E?

Farming Systems Research and Extension (FSR/E) is an approach to agricultural development that has emerged in the work of international agricultural research centers. FSR/E is most often contrasted to traditional commodity research aimed primarily at cash crops and the commercial enterprises of larger farmers. In developing countries, small farmers with limited resources often do not adopt new technologies because (1) their conditions are not like those at experiment stations where the technologies were developed, (2) they do not have resources to purchase the required inputs, (3) the technologies do not apply to the crops grown or the livestock raised on their farms, or the way they operate, or (4) they do not know about the new technologies. For whatever reason, development of new technologies sometimes leaves small farmers worse off than before. This happens when large farmers adopt new technologies and small farmers do not, and where research serves the interests of large farmers while ignoring the needs of small farmers.

While much of FSR/E has been directed towards smaller farmers with limited resources in developing countries, the approach has relevance for improving agricultural research and development in the United States for farms of all kinds and sizes. This is in keeping with the purposes of FSR/E as explained by Shaner et al (1982):

As with other national approaches to agricultural research and extension, the purpose of Farming Systems Research and Development is to generate more appropriate technologies for farmers and, where possible, to improve policies and support services for farm production, to raise farm families' welfare, and to enhance society's goals. But more specifically, FSR & D [Farming Systems Research and Development] aims at increasing the productivity of farming systems by generating technologies for particular groups of farmers and by developing greater insight into which technologies fit where and why. This latter purpose concerns using scientific methods for generating hypotheses and then,

by deduction, determining which technologies to use in a particular farm setting. Such an approach contrasts with an empirical approach that through trial and error arrives at suitable technologies for the conditions of specific farmers.

We include the farm family in the above description because the collective interests of the family are important, not just the interest of the head of the household. Furthermore, we include agricultural production because FSR & D concentrates on increasing crop and livestock yields and overall farm output. And we include family welfare because improved welfare is the ultimate goal of individual families just as societal interests are the ultimate concern of an enlightened government. (p.13)

Characteristics of an FSR/E Approach

There is no definitive list of FSR/E characteristics. Different projects and teams take slightly different perspectives. However, there are some common threads that run through the FSR/E literature about the central characteristics of a farming systems approach.

1. FSR/E takes a holistic approach, i.e., the FSR/E team looks at the whole farm operation and its context.
2. FSR/E views the whole farm and groups of farms as a system such that (1) the parts are interdependent, (2) the whole is greater than the sum of the parts, and (3) changes in one part of the system will have repercussions throughout the system.
3. FSR/E is interdisciplinary. No single disciplinary perspective permits a genuinely holistic perspective.
4. FSR/E is a team effort. No single individual can represent a holistic, interdisciplinary effort.
5. FSR/E values, combines and integrates agricultural and social sciences. This is part of the holistic, interdisciplinary, team approach.
6. FSR/E requires strong linkages between and full participation of both research and extension throughout the FSR/E process.
7. FSR/E involves on-farm research aimed at testing technological solutions under real farm conditions - both environmental and management conditions.
8. FSR/E includes farmers as partners and collaborators in designing and evaluating on-farm trials.
9. FSR/E is complementary to other agricultural development

approaches. It replaces neither commodity nor disciplinary research, nor extension. On the contrary, FSR/E requires a continuing inflow of improvements from such research and close contact with farmers through extension. The direction that FSR/E gives to commodity and disciplinary research, coupled with influence on extension, is as important as improvements introduced to farmers participating directly in on-farm experiments.

10. FSR/E is a problem-solving approach. It tends to be applied to specific, short-run objectives, as when adapting available technologies. FSR/E identifies problems on farms and introduces improvements that frequently require little governmental support. The approach identifies farmers' constraints and distinguishes between those constraints that are within and those that are beyond their control. It works with farmers to solve manageable problems.
11. FSR/E is iterative and dynamic. The approach calls for a conceptual understanding of the farming system and its environment from the very beginning. This framework provides the basis for gathering data and directing the course of the research and development effort. Initially, the system may not be well understood, but the conceptualization improves as the FSR/E team gathers data and gains experience.

FSR/E's iterative nature emerges in the process by which the team works. The team begins by acting on partial information, gains insight through studies and experimentation, and modifies its actions. This process continues until research and extension staff are satisfied that changes can be broadly implemented. Such an approach encourages the FSR/E team to begin working within a whole farm framework from the outset, rather than working haphazardly or waiting for excessive precision before initiating on-farm research. In this way, FSR/E seeks to provide better solutions to farmers' conditions, but not necessarily the best solutions.

Solutions to one set of problems usually generate opportunities for further research. FSR/E is dynamic in that objectives and approaches for future work can be adjusted in light of the accomplishments. For example, FSR & D might initially work with only slight modifications in farmers' existing cropping and livestock patterns. After the farmers grow accustomed to change, greater modifications to their farming systems could be tried.

12. FSR/E examines sub-systems within a systems framework. Sub-systems include the (a) physical/biological environment, (b) crops, (c) livestock, (d) the household, (e) markets, and (f) the policy/political environment.

Stages of FSR/E

Farming systems research and extension is most often characterized as having five stages.

1. Problem Identification/Diagnosis. The problem-identification or diagnostic stage occurs as the actual farming system is examined in the context of the "total environment"--to identify constraints farmers face and to ascertain the potential flexibility in the farming system in terms of timing, slack resources, etc. An effort is also made to understand goals and motivation of farmers that may affect their efforts to improve the farming system. The area (or "recommendation domain") in which the approach will be applied is delineated. Survey information (often an informal survey called a "sondeo") is gathered from farm family members to assist in problem-identification.
2. Generating Potential Solutions. Based on the initial diagnosis the FSR/E team works with research specialists, experiment station staff, extension personnel, and farmers to generate potential solutions to identified problems. During this "design" stage a range of strategies is identified that is thought to be relevant in dealing with the constraints delineated in the descriptive or diagnostic stage. Heavy reliance at this stage is placed on obtaining information from the relevant "body of knowledge" as well as researchers, extension and farmers.
3. Testing Solutions Under Farm Conditions. During the testing stage a few promising strategies arising from the design stage are examined and evaluated under farm conditions to ascertain their suitability for producing desirable and acceptable changes in the existing farming system. This stage often consists of two parts: initial trials at the farm level with joint researcher and farmer participation (researcher managed), then farmer's testing with total control by farmers themselves (farmer managed).
4. Evaluating Solutions. On-farm trials include not only traditional research criteria (e.g., productivity, yield, cost-benefit), but farmer criteria (acceptability, understandability). Farmers' evaluation is critical.
5. Disseminating Solutions. During this extension stage the strategies that were identified and screened during the design and testing stages are implemented on additional farms. On-going testing and evaluation occur throughout the extension process. The system is further specified and better understood as additional data are gathered. This leads back to the first step.

MINNESOTA'S FSR/E PROJECT

In February, 1984, faculty at the University of Minnesota began identifying how a farming systems approach could be applied in Minnesota. The Minnesota FSR/E team developed criteria outlining the basic components desirable in a Minnesota FSR/E Project. Those criteria are listed below.

Basic Components of a Minnesota FSR/E Project

- Focus on limited resource farm families
- Experiment with alternative FSR/E approaches, e.g., teaming alternatives, variations in social science - ag science team mixes..., which would lead to --
- Contributions to and development of FSR/E methodology
- Develop criteria for evaluation of FSR/E
- Be genuinely and operationally interdisciplinary (interactive, integrative, holistic, interdependent, problem-oriented)
- Include four minimum system components: crops, animals, markets, and the farm household
- Provide potential comparison to a traditional commodity approach
- Incorporate strong family perspective, especially labor utilization
- Be Minnesota-based but conceptually applicable in an international setting
- Result in faculty participants becoming effective teachers of FSR/E
- Provide opportunities for graduate student training and experience
- Allow participants to study selves as FSR/E Team participants and develop training approaches for interdisciplinary team work
- Constitute a five year FSR/E project commitment

Having committed ourselves to undertaking a domestic (Minnesota) FSR/E project, we began the process of selecting an appropriate agri-ecological area in which to work.

NORTHEAST MINNESOTA FSR/E PROJECT

On March 22, 1984, three team faculty members from the St. Paul Campus of the University of Minnesota¹ met with Agricultural Experiment Station and Agricultural Extension Service staff at the Grand Rapids Experiment Station. We discussed the possibilities for conducting a "sondeo" (informal diagnostic survey) in the Northeast as a way of identifying the parameters for one or more farming systems in which we might develop a full scale farming systems project in line with the criteria listed in the previous section. We then identified an area that meets all of the major criteria we had specified. That area is where the counties of Carlton, south St. Louis, and Aitkin meet. It includes the communities of Cromwell, Tamarack, Floodwood, and possibly Kettle River in Northeast Minnesota.

The area extension agent, Dave Radford, was particularly enthusiastic about undertaking the project in this area. He gave the St. Paul team one of his patented sales jobs on Northeast Minnesota needs and opportunities, and he pledged the enthusiastic cooperation of extension. Joe Rust (Experiment Station Superintendent) and David Rabas (Experiment Station Agronomist) expressed support on behalf of the Experiment Station. Thus, from the outset, the Northeast Minnesota FSR/E Project has been a collaborative effort among extension staff, the experiment station, and St. Paul campus faculty.

1. Professors Vernon Cardwell (Agronomy), Martha Gaudreau (Soil Science), and Michael Patton (Social Science and Extension).

The area identified by Dave Radford was ideal from the point of view of team members. Radford estimated that this area would include approximately 300 limited resource farm families most of whom would be involved in dairy or livestock production. Many of these farm families rely on farming as their major source of income. It is an area with significant drainage and wetness problems, lying in a trough about 50 miles west of Lake Superior in an area where the last glaciers of the ice age extended their final grasp.

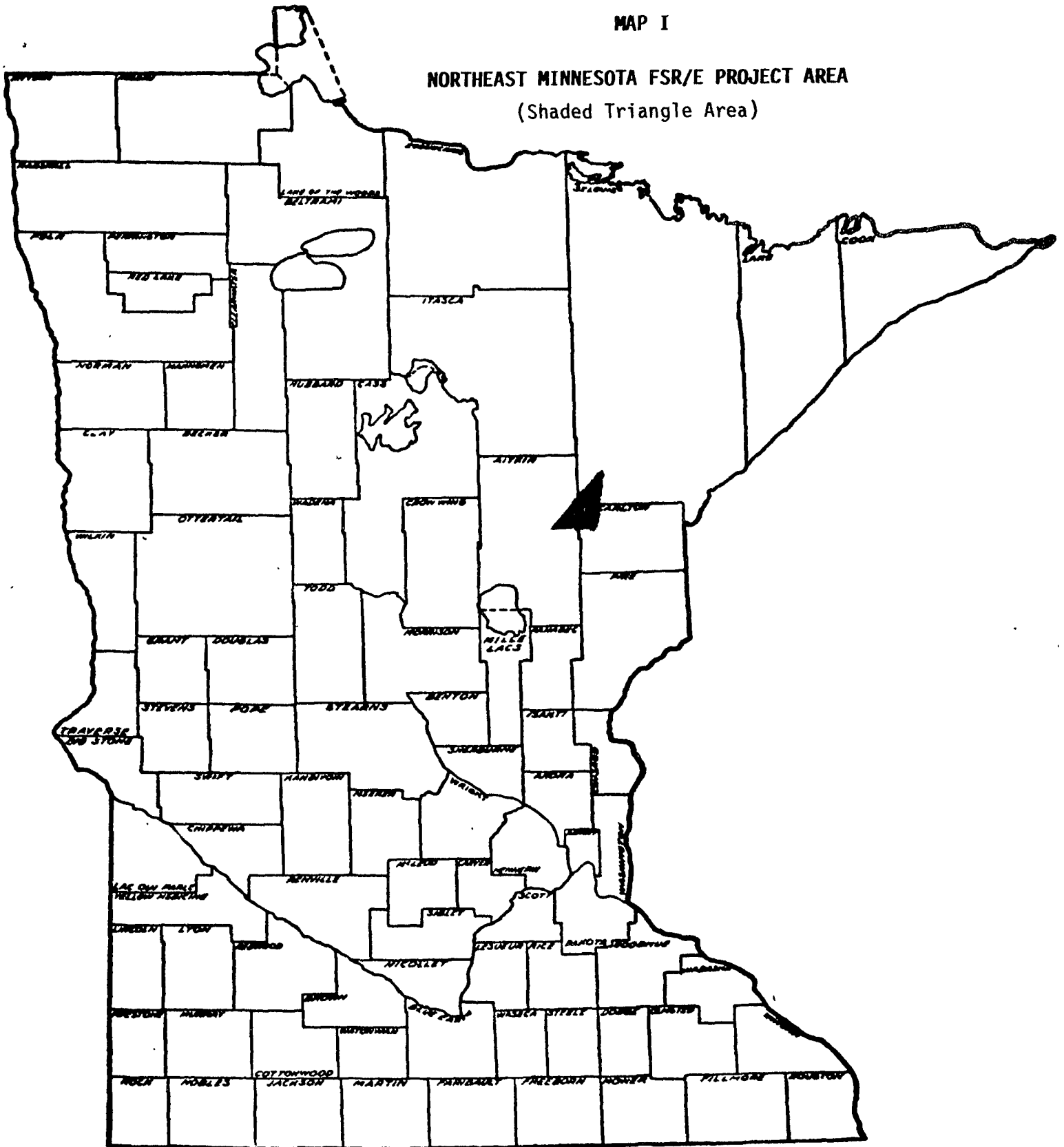
There are some successful farmers, these being "progressive" farmers, but on the whole the area was characterized as being significantly below realizing its potential for farm productivity. The area has one of the shortest growing seasons in Minnesota because the frost moves into the low lying areas early. A large number of these farmers probably net under \$10,000 a year annual income.

It is primarily an agricultural area but has not been significantly involved with agricultural extension service in the past. The place where these three counties meet is 40-50 miles from the respective county extension offices making regular extension contact difficult and minimal. Both the experiment station and extension people with whom we met felt that a survey of farmers in this area would make a substantial contribution towards helping them understand how these farmers might be better served and would contribute to identifying problems that could be attacked through both research and extension. Both the experiment station and extension personnel were highly supportive of the proposed survey and committed to providing support in whatever ways possible.

Map 1 shows the location of the three counties in Minnesota and Map 2 shows the primary communities on which the FSR/E project focused. Table 1,

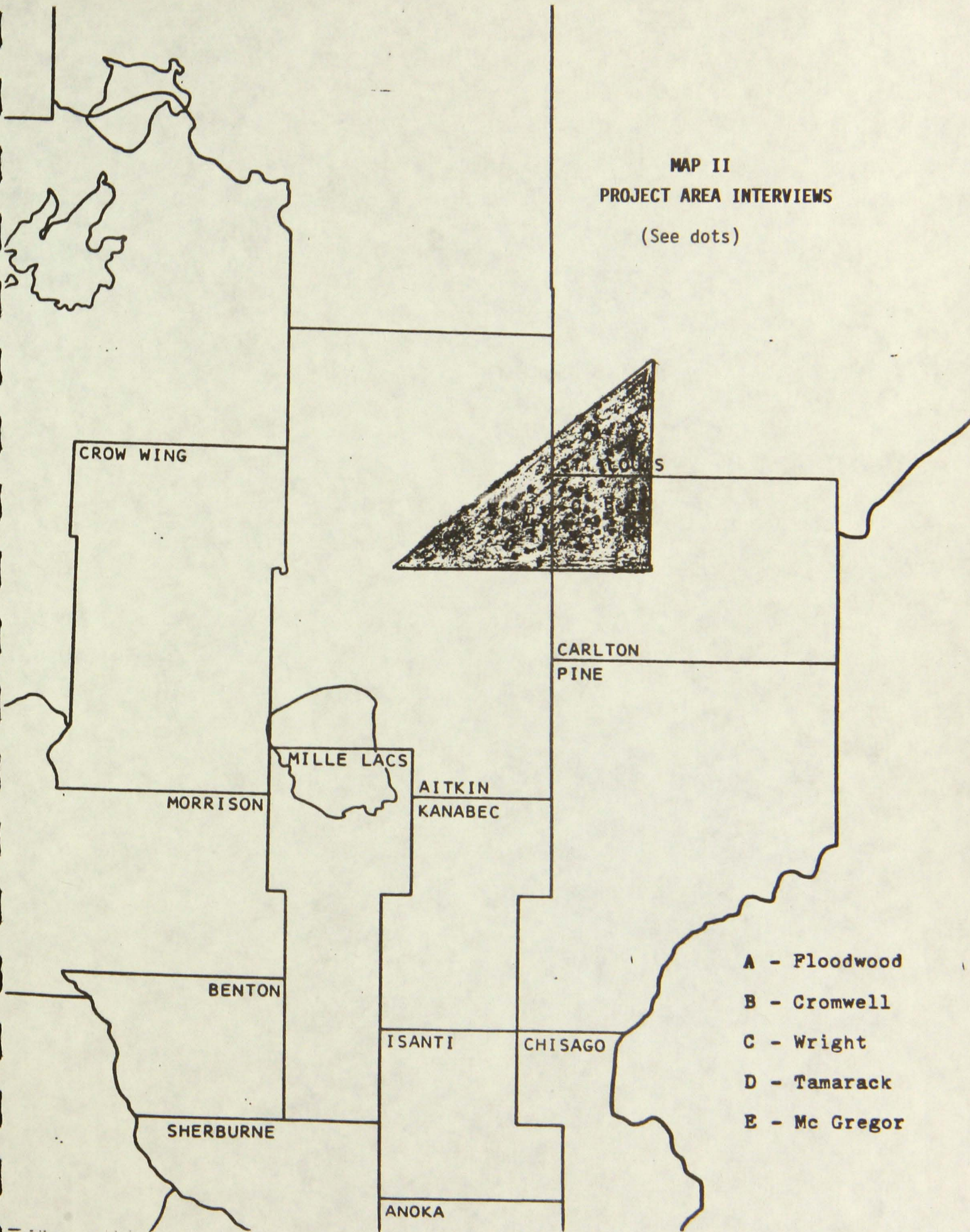
MAP I

NORTHEAST MINNESOTA FSR/E PROJECT AREA
(Shaded Triangle Area)



MAP II
PROJECT AREA INTERVIEWS

(See dots)



- A - Floodwood
- B - Cromwell
- C - Wright
- D - Tamarack
- E - Mc Gregor

below, shows the population of these communities and distances from Duluth and Saint Paul.

Table 1

<u>Community</u>	<u>Population</u>		<u>Miles West of Duluth</u>	<u>Miles North of St. Paul</u>
	1970	1980		
Floodwood	650	648	44	147
Cromwell	181	229	40	129
Tamarack	100	83	52	131
McGregor	331	447	60	139
Wright	132	162	46	130

Detailed Description of the Northeast Project Environment

The elevation of the area is 1200 - 1400 feet above sea level. Three landforms dominate the area as a result of past glacial activity: lake plains, terminal moraines, and ground moraines. The soils of the lake plains are composed of heavy clay with some sand ridges. The level surface retains moisture and is poorly drained. Near Tamarack part of the land is formed by terminal moraines which have coarse soil, steep slopes, and poor drainage. South and east of Cromwell the land is gently rolling and the soil is composed of clay to fine boulders. This is due to the presence of ground moraines. The surface soils of the area are predominantly loam and peat with some areas of sand. Loam is a soil of mixed sand, clay, and organic material exhibiting great differences in its suitability for agriculture.

The peat in the area is largely a higher energy peat comparable to lignite and other more conventionally used coals. This peat produces very little ash during burning. Half of the United States total resources in peat are in Minnesota. Because of rising prices of conventional fuels, and

possible ecological damage from strip mining western coals in arid areas, there has been considerable interest in peat as an economically feasible alternative fuel sources. A new peat plant is coming into the area west of Cromwell. This is a hotly debated issue among local farmers because of its possible effects on area drainage.

Pre-settlement vegetation in the project area consisted of bogs, swamps, and pine forest. In 1977, the major forest types were identified as largely aspen and birch, followed by spruce-fir and maple-basswood. There are also some elm-ash, cottonwood areas and some unproductive forest land.

Three watersheds affect the area. They are the Lake Superior Basin, St. Croix River Basin, and Upper Mississippi Basin. The average annual water runoff is 10 inches. The snow cover with a minimum depth of 1 inch lasts for between 125 - 130 days per year. The first day for a minimum snow cover of 1 inch is usually between November 19 - 22. The last day for a 1 inch cover is about April 12. The snow is deepest during the months of January and February with annual snowfall between 60 and 70 inches.

The last spring frost in the McGregor and Tamarack area is between May 22 - 31. Near the Aitkin line and into the areas of Floodwood and Cromwell, the frost goes out June 1 or later. The first fall frost appears around September 1 around Floodwood and Cromwell while the first fall frost appears between September 6 - 15 near Tamarack and McGregor. The average number of frost free days for Floodwood and Cromwell is less than 100. The area near Tamarack and McGregor has an average of 100 - 120 days.

The average annual precipitation is 28 inches with precipitation of 18 - 20 inches during the growing season. The average July temperature is 78 - 82 °F (26-28°C). The average January temperature is 16 - 20 °F (-9 -

-7°C).

The prevailing winds are affected by Lake Superior and by the topography, producing great changes in wind direction throughout the year. These winds affect local changes in the growing season.

In 1983, there were 103,000 farms in Minnesota. The average number of acres per farm equalled 295 acres. The farm size in the project communities falls considerably below this average. In 1974 the average farm in this area was between 160 - 240 acres. In 1982, the average value of Minnesota farmland was \$1179/acre. In the Northeast, the average value was \$483/acre.

Dairy and beef production are common operations in the area.

Most of the farmers attempt to grow their own forage. Alfalfa, clover, and orchard grass are used as well as some sorghum and canary grass. Oats and corn are grown by many farmers in an attempt to balance the nutritional content of their feed. In the situations where the farmers are married, both the husband and wife participate in the farm work.

Forestry is another type of land usages in the area. Some of the people grow and sell Christmas trees while others log off the land and have small saw mills for cutting lumber. Some of the logging is done on their own land while a part of it is done by contracting for the use of timber resources on public land.

Many of the farm families rely on supplemental income. This income is derived from the mines to the north, the mill in Cloquet, and various other sources in Duluth and locally.

A large percentage of the area is of Scandinavian descent; 65% of the area, including Floodwood, is Finnish. Near Cromwell, there are some Polish farmers. The Scandinavian Co-operative movement has been in

operation in this area since the early 1900's. Co-operatives offer the opportunity to have a supply of needed items within a shorter driving distance as well as at lower prices to members. This year the Floodwood Co-operative will be closing. The Wright Co-operative (west of Cromwell) is doing very well.

Educational institutions in this area include elementary and secondary schools. Cromwell area children go to Wright elementary school. Older children from Wright and Cromwell go to Cromwell high school.

The emphasis on tourism in the area is increasing. Some of the land once cleared for planting has been reforested.

The area was settled in the late 1800's. People chose this land for farming because it was free land. Many of these people were immigrants who came from systems associating land ownership with status and survival. Many of today's farms have been owned by family members for years. Other farms are being operated by more recent arrivals who have come to the area. Many of the young people leave the area for lack of job possibilities. Some return. Although the percentage of the population over 65 years of age is higher than the state average, there are many young farmers in the area who are committed to farming as a way of life.

Parameters of the Northeast FSR/E Project

From the beginning the Northeast Minnesota FSR/E project has operated on a shoestring. The Office of International Agricultural Programs in the Institute of Agriculture, Forestry and Home Economics was able to provide a graduate research assistant and travel support for the initial diagnostic survey. All faculty time was contributed. The memorandum to team members summarizing our initial commitment to the project noted the modest beginnings of our effort, but also held out the hope for eventually

developing the project into a larger, funded effort. An excerpt from the March, 1984, memorandum to team members is reproduced below to capture the spirit of our thinking at the time.

We are now committed to undertaking a sondeo in Northeast Minnesota. In order to determine how large a sample we can manage and to calculate the costs of collecting data, we need to know immediately how many people are willing to commit themselves to doing fieldwork during the second week of June. This commitment will also involve participation in instrument development and field preparation training.

The actual field work will be conducted in teams of two with each team composed of a biological/agricultural scientist and a social scientist. Both graduate students and faculty are invited to participate in the project. We do not expect to have funds available for salaries during the field work but we do expect to cover field work expenses. All Farming System Associates are invited to participate in instrument development and field training whether or not you are actually going to participate in the field work.

In our discussions with the Northeast Minnesota agricultural personnel we have attempted to be careful not to make any promises about what might follow from the survey. At this point we see this as a survey aimed at establishing the parameters of farming systems in this area. That information will permit us to develop a full scale, comprehensive farming systems project that would address the major farming problems of the area and include more detailed specification of the farming systems, and recommendations leading to on-farm trials and a comprehensive, interdisciplinary approach to interventions in the farming systems.

We would expect, then, to use the data from this initial survey to seek funds to carry out a major Minnesota Farmings Systems Project. At the same time, however, we expect these data to be valuable in and of themselves in that they will help us understand the methodology involved in specifying the parameters of a farming system and will give us concrete experience in working together in an interdisciplinary team to understand and specify a specific farming system. In that regard, then, we see this as a significant and important undertaking, and one to which we have made a serious commitment with the agricultural personnel in the Northeast. This memorandum invites you to join us in that commitment.

March 23, 1984

The next section describes the results of the Northeast Minnesota FSR/E Sondeo. The interview guidelines used in conducting the Sondeo are included in the appendix of this report.

SONDEO REPORT AND OVERVIEW OF FINDINGS
NORTHEAST MINNESOTA FARMING SYSTEMS PROJECT**
UNIVERSITY OF MINNESOTA
Summer, 1984

During the first two weeks of June the University of Minnesota Farming Systems Research and Extension study group conducted interviews with members of fifty farm families in Northeastern Minnesota. The purpose of the study is to make an initial characterization of the farming systems and subsystems in the communities around Floodwood, Cromwell, Tamarack and McGregor in South St. Louis, Northeast Aitkin, and Northwest Carlton counties.

The purpose of the interviews was to increase our understanding of farm family conditions, problems, challenges and opportunities in this area. The results reported here are the results of the initial discussions of the ten University of Minnesota interviewers who participated in the project. This report is being provided to people who were interviewed, to select Agricultural Extension Service staff, and to others interested in Farming Systems Research and Extension. The purpose of distributing this preliminary report is to stimulate further discussion of the problems and opportunities in Northeastern Minnesota as well as to provide rapid feedback to people who have been following the progress of the study.

Important Distinctions

There are two major farm family groups that were interviewed. First,

**Project research staff: Laura S. Brophy, agronomy; Vernon B. Cardwell, agronomy; Martha Gaudreau, soil science; Robert Hassett, agricultural education; Sonia E. Patten, anthropology; Michael Q. Patton, social sciences; Jane Plihal, home economics education; Carol A. Pogue, rural sociology; David Rabas, experiment station agronomist; and Delane Welsch, agricultural economics.

there is a substantial group of commercially-oriented dairy farmers. These people typically work full-time in dairy farming and milk between 25-45 cows at any one time. They depend on dairy production as their primary source of income, and if there is off-farm income it is being used to support and build the dairy farm.

The second group consists of people for whom farming is not a primary commercial operation. These are primarily beef producers, although people milking a small number of cows also fall into this group. These families depend on off-farm work as their primary source of income. Beef cattle production is used to supplement income. Beef production is undertaken because it involves relatively low labor and management, thus making it easier to work off-farm. Moreover, beef operations are primarily oriented towards producing calves for sale rather than fattening cattle for slaughter. The latter practice is not profitable because of the problems of producing grain in this area. With low beef prices, it is difficult to run a profitable beef operation. Another problem of beef producers is the inconsistent cash flow with only one or two pay checks per year.

Because of the importance of commercial dairy farming to the area, this preliminary report is directed primarily to the commercial dairy family farm system.

Catagories of Commercial Dairy Farmers

Four different kinds of commercial dairy farmers emerged during the interviews. These four categories represent significantly different situations for the farmers involved.

(1) Multi-generation family farms.

Farmers who have multi-generational family farm operations have been involved in farming for at least two generations. The farms are inherited or are farmed by more than one generation.

One of the major issues that emerged in these interviews concerned problems of transition from the older generation to the younger generation. The transition process can be laden with conflicts and ambiguities while decision-making is shared or while it is being transferred from older family members to younger family members. It appears that they have very little assistance in planning such transitions.

Sharing farming operations and dividing labor among siblings is a closely related issue. There are also some uncertain tax issues involved in handing down a farm, and some respondents raised questions about how to homestead the farm for tax credit during the transition without formally giving title to the kids. Thus, one area of potential research and extension work for these farm families concerns issues involved in facilitating the transition and handing down of farm family operations from generation to generation.

Some young farmers who have inherited the farm also lack operating capital because of resistance to using credit, thus limiting their production options.

- (2) Current farmers who have purchased rather than inherited their family farming operation fall into three groups:
 - (a) First, there are those who purchased their farms prior to 1960 and are nearing or actually facing retirement. These farm families are facing decisions about what to do with their farms, how to ease into the transition from active farming to retirement, what to do with land that is not being actively farmed, and how to prepare for the later years of their lives.
 - (b) Farm families who purchased their farm operations between 1960 and 1974. These are fairly stable, viable farm operations, relatively debt-free because purchases were made prior to the rapid increases in interest rates and land values that came in the last ten years.
 - (c) Farm families who purchased their farms after 1974 compose the final group. These tend to be struggling younger farmers who are heavily in debt because their farming purchases came at a time of rapidly increasing land values and rapidly increasing interest rates. Interest rates have stayed high but land values have declined, reducing their net asset value. These farming operations also tend to be heavily mechanized and capitalized. This is the group that is having the greatest difficulty in operating a commercially viable and profitable family farming operation.

In all three categories above there are instances where at least one spouse is working off-farm and where, without that off-farm income, the farm would not be viable. Off-farm work helps support the farm and is

chosen largely on the basis of whatever opportunities are available to either spouse. This contributes to farm labor shortages but contributes capital to the farm.

EMERGENT ISSUES

The following sections describe major issues that emerged in the interviews. In this preliminary report these are issues which are particularly important for improving the viability, productivity and efficiency of family farming operations in this area. These issues need further study, but several of them have the potential for becoming important topics of research and extension activity immediately.

Crops and Forage

The priority for the dairy farms in this area is improved forage production and storage. Higher quality forage for this area means high protein content, resistance to disease, minimal or no need for liming, and long lasting stands. Improved storage means drying and preserving the high quality of the forage until used. Improving forage would reduce the need for feed grains and soybean meal which constitute one of the highest costs of production. Feed grains cannot be efficiently grown in the area and must be imported at considerable cost.

This area of Minnesota has the shortest growing season in the state. It lies in a weather trough that comes off of Lake Superior. The low lying land, the weather trough, and the Northern zone combine to make it an area that is relatively wet and cold, with a very short and uncertain growing season. Dairy and beef farmers cannot grow sufficient quantities of needed feed grains, and so grains must be purchased at high cost. Furthermore,

there are no grain elevators in the area. In order to productively grow alfalfa for forage, liming is necessary, and the cost of lime transported to this area is relatively high. Alfalfa production is a one or two cut system with the number of cuts determined by the weather. These constraints, and other difficulties in production, suggest several possible areas for further research and extension activity:

1. Many farmers were interested in better adapted varieties of alfalfa, or forage alternatives to alfalfa. Because of the expense of liming, and because of some land tenure problems which are described later, farmers are interested in grasses and legumes that are suitable for forage, for example, Birdsfoot trefoil, a forage legume. There is particular interest in information about low alkaloid varieties of canarygrass, orchardgrass, sudangrass or (sorghum-sudangrass). Other alternatives in forage and silage that could be explored include the potential for faba beans, Japanese millet, and sorghum.

2. Very few farmers are testing their forage to determine its quality; the protein content of various forage alternatives is something about which very few farmers have information.

3. Forage preservatives - there is a great deal of interest in information about forage preservatives. It appears that forage preservatives need to be tested in this low temperature/wet environment. Forage quality and storage are key issues for these dairy farmers.

4. Forage cutting and storage alternatives are of interest in part because this area made a major transition in forage cutting practices in the 1950's. The current reliance on heavy machinery limits the ability to get into the fields to cut. The weather patterns and wetness of the area suggest potential for more research and information regarding forage cutting and forage alternatives.

5. Herbicides and weed control information is not generally shared among farmers; there is considerable diversity of opinion about ways of controlling weeds, including the relative economics and efficiency of different weed control methods. Some farmers perceive agricultural extension agents as "cousins" of or "lackeys for" chemical companies. The general interest in water quality problems may be related to chemical use and alternatives to chemical use.

Farmers using chemicals expressed a desire for specific recommendations about which chemicals are best for their conditions and needs. There are other serious, established

farmers who are committed to farming without chemicals and are interested in non-chemical farming approaches. Information about the relative economics of these alternative approaches is needed.

The immediate problem in weed control is the widespread incidence of tall buttercup, mustard, and oxeye daisies. It would take a concerted effort at the community level to control for these weeds which threaten pastures throughout the area. Individual farmer action is relatively ineffective if neighbors do not take action.

6. Short season grains need to be explored, especially a short season field corn variety that is fairly dependable, short season soybeans, or other grain alternatives. The desire for short season grain varieties is related to a change in harvesting methods. Formerly binding, shocking and threshing permitted harvesting small grains under poor drying conditions which the modern methods of swathing and combining, or direct combining, often do not permit.

7. Further research and information is needed on corn for silage, including the best growing, cutting and storing procedures.

8. There is interest in better oat varieties, particularly early maturing, disease resistant varieties. It appears that many farmers are using older, late maturing varieties, and that there is little generally shared knowledge about the best oat varieties for this area.

Overall, these issues and problems suggest that both research and information are needed to improve grain and forage production for family dairy farmers in this area.

Young Farmers Organization

We interviewed a number of relatively younger or newer farmers who are struggling to build viable family farm operations. For the most part, these young farm families are not in contact with each other. In many cases they are relatively isolated from the community. Many of them have the same information needs and are making similar mistakes. They are reluctant, in some cases, to ask questions of older, more experienced farmers because they worry that they are perceived as intruders or competitors. They tend to read a great deal, but are not always certain how to apply what they read to their own situation. All of them indicated

that they would be interested in being a part of a young farmers group where ideas and information could be exchanged. There is such a group organized by the veterinarian out of Moose Lake. However, that group of 15-16 couples is already too large. No organized young farmers group exists in the area where we conducted the interviews. The model out of Moose Lake appears to have some attractiveness for these young farmers.

While the Referral Farmer System is known by some of these young farmers, and has been used by some of them, there is still not a great deal of contact between younger, less experienced farmers and older, more experienced farmers. A young farmers group might provide a firm foundation for building and strengthening such contact. It is clear, however, that these young farmers are not simply looking for a social group. They want to be part of a group that is involved in the informal exchange of useful information. Such a group would include both husband and wives and would focus on specific topics of interest to group members.

Land Availability

Most farmers we interviewed are renting some land for forage production. However, there are some interesting problems with such renters. First, many farmers perceive a need to improve these rented pastures or forage areas, but are unwilling to do so unless they are sure that they will not lose their inputs through subsequent sale of the land. However, land owners seem to be reluctant, in some cases, to provide the needed guarantees because it reduces their ability to sell the land. Farmers experiencing this problem expressed an interest in a "model land leasing contract" that would provide them the land tenure security to improve rented lands without significantly reducing the ability of land owners to sell their lands. Many farmers expressed a willingness to

improve rented lands if they could have some guarantee that those improvements would not simply make the land more salable and therefore lead to a loss of their inputs and time.

There is also some concern about changing land use patterns. Competition is emerging between farm land and tourism/lakeshore development. There appear to be incentives to put some land back into trees which conflict with the need for more forage and pasture land. This was of particular concern to farmers whose forebears had worked so hard to clear the land. There are also problems in classifying open land for tax assessment purposes. Another tax problem is concern about being able to obtain homestead tax credits for nonadjacent land.

This combination of problems suggests the importance and need for research on land use and land tenure problems in this area.

Drainage

Because of the large amount of low lying land, there are a number of concerns about drainage. There is a general perception that conservation ditch programs have declined. Many farmers are having problems maintaining drainage on their farms. There is a general perception that county and township programs of maintaining ditches along roads have been reduced with severe consequences for adjoining land. Drainage incentives and the consequences of drainage for the environment are issues of considerable interest. Better information about drainage problems and solutions is a general concern, a concern that involves policy questions and county decision-makers. In this regard, there was frequently concern about the constraints imposed by a state law which makes it illegal to deepen drains beyond their original depth (even when one can determine original depth, which is often difficult). Getting DNR permits for drainage was also

perceived as a problem. Concern about the effects of the new peat plant on drainage also emerged in some interviews.

General Issues of Interest

The priorities for improved dairy production focused on being able to grow grain to reduce feed grain prices, and improved forage production and storage. Priorities are clearly short season grains and improved forage quality. However, other issues emerged in which there was considerable interest. The ten issues listed below are in no particular order. Sometimes a concern was mentioned by only one or two farm families; in other cases several families mentioned the problem. In all cases, we view these issues as preliminary observations, concerns, and problems that need further investigation.

1. Alternative production systems. With dairy prices depressed and beef prices below a commercially viable level, there are people interested in alternative farming approaches. These alternatives include truck farming, growing asparagus, and commercial forestry. Another alternative worth seriously exploring is grass-based dairy production with minimal feed grain use.

2. Energy alternatives. Farmers told us that REA energy costs are the highest in the state. One of the most expensive components of dairy production is electricity. Most of the farmers interviewed were interested in viable alternatives to the high cost of electrical energy. Specific alternatives of interest included wind energy, methane, and solar operations. Particularly lacking was information about the economics of wind energy, including tax and production benefits.

3. Future of the Family Farm. There is considerable ambivalence about the future of family farming in this area. On the one hand parents value rural family life and believe that the qualities of farm family life are worth preserving. On the other hand, they recognize that the farming life means hard work, long hours, and high risks. Therefore, the parents we interviewed are not directly encouraging their children to into farming. They take a fairly laissez-faire approach to their children's future in farming. "Kids must make their own decisions. It is not our place to push them into farming. If they want to, fine; if they don't, fine." This uncertainty and ambivalence about the future

of family farming as an activity passed on from generation to generation may hold opportunities for youth programs and extension activities to provide assistance in clarifying and reinforcing, where appropriate, values associated with rural life and family farming.

It is also important to note that these ambiguities about the future of family farming do not mean that current family bonds are weak. It is clear that in most cases farming in this area is a family partnership with responsibilities shared by wife, husband, and children. There is a great deal of intergenerational care provided. Taking care of elderly parents and relatives consumes a great deal of time and resources in many households. Local kin networks are still strong and important with marriages among young people in the community continuing to bind families and kin groups together. These close-knit kinship networks contribute to the difficulties outsiders experience in attempting to become integrated into these communities. Marriage to a local resident remains the best way to become integrated into the community.

4. Farm Family Stress. We noted above that these farm family members recognize that the farming life is hard work. It is also stressful. Farm families feel overworked. They feel the strain of not feeling they can get away. The high risks of dairy farming, the constant demands, and inadequate labor all contribute to stress. Some people we interviewed described the stress they felt. Others didn't need to, it was obvious. And still others reported high levels of satisfaction, peace of mind, and confidence. Stress, however, was sufficiently in evidence to be a matter worth further study and work.

5. Credit. Credit is a concern for many farmers. Many told stories of their own or others' experiences with indiscriminate approval of loans, lack of monitoring, inadequate study prior to granting loans, and lack of follow-up to assist through financial and management counseling. Stories included "people who got loans who shouldn't have" as well as people who "should have but didn't." There were complaints about credit paperwork, unclear or inappropriate standards, and irrelevant criteria. Some gave up on the process. Credit is viewed as a serious problem to many farmers in this area.

6. Youth programs, especially 4-H and vocational agricultural courses are a concern for some people interviewed. The strength of 4-H varies by community and is generally perceived as less agriculturally oriented than in the past, though some programs are still strong. Vocational agriculture is in decline in the schools. These farm families are concerned about the future for their children, but are uncertain about how youth programs could contribute to farming itself. Many 4-H activities are not viewed as related directly to farming. These concerns for agriculturally oriented youth programs are related to parents' reluctance to encourage their children to go into farming, and reflect the ambivalence of many parents about the future of agriculture and

what is best for their children.

7. Image of Farming. The image of farming in today's world is a concern to many of these farmers. They feel that farming is undervalued and underappreciated both locally and nationally. Some suggested a need for more general public education about the importance of farming to the community and the nation. They also believe that higher status and a better image for farming might help keep more young people on the farm.

8. Calf hutches. We found considerable controversy and disagreement among farmers about the idea of using hutches which allow calves to be outside during all or most of winter. At least two farmers using hutches have had great success with them and highly recommend them. Others think the idea is crazy. Better information about exactly what is involved and the benefits that are possible are needed.

9. Wild Animal Control. Some farmers are experiencing severe problems with bears. At least two farmers have completely stopped attempting to grow field corn because of the great destruction caused by bears within the last two years. There is a general perception that the bear population has been increasing and is a threat to both corn fields and herds. We found very little concern about wolves or coyotes, although it is clear that these farmers pay attention to the potential for such problems.

10. Stray voltage. At least one family is well-known for having had a stray voltage problem. While the potential problems raised by stray voltage were well-known, very little information seemed to be available about exactly how to detect and guard against stray voltage. For several farmers this was a matter of considerable concern.

The Grand Rapids Agricultural Experiment Station

Farmers interviewed did not perceive the Grand Rapids Agricultural Experiment Station research as relevant to their farming problems. Many simply couldn't judge the potential of experiment station research from lack of knowledge, information or interest. They feel that the conditions at Grand Rapids and the topics under investigation do not make the Grand Rapids Experiment Station an important source of information for them. However, few reported taking any initiative in seeking information from the experiment station.

Agricultural Extension Service

Few farmers we interviewed have regular or important contacts with the Agricultural Extension Service. While older or more experienced farmers seem more knowledgeable and aware of the Agricultural Extension Service, the less experienced farmers have very limited perceptions of either the utility of the Agricultural Extension Service or the services available. The Referral Farmer Program is not well known. There is some knowledge of farm tours and winter meetings, but in many cases this knowledge was vague. Our own experiences in using Agricultural Extension Service lists for sampling suggest that these lists are outdated and do not include many of the newer and younger farmers in the area.

Some people were aware that the extension office is on the other side of the county and suggested that they could make better use of the extension service if the agent was available at a set time in a local area at least once a week, for example, one half day a week in Floodwood at a regularly scheduled time.

A question was also raised about the division of labor among Extension agents. The Home Economics Extension agents are perceived as serving nonfarmers for the most part. Among dairy farmers, there is very much shared labor on the dairy operation between husbands and wives. Several farm wives felt that the local homemaker programs were not relevant to their concerns. It appears that there may be some potential for greater integration of agricultural and home economics work with regard to dairy farming in this area.

Important sources of information mentioned by farmers included farm tours and the referral farmers program, both organized by extension. The county extension newsletter was also read and used by the many farmers.

Other sources of information included the radio (especially an extension radio program), farmer magazines, and local newspapers. Many said they relied heavily for information on word of mouth and informal contacts with neighbors or relatives.

General Observations

The interviewers found these farm family members to be friendly, hard working, and committed to their farm family operations. The challenges and difficulties of farming in this area are substantial. There are great risks involved and the work is exceptionally hard. We found people anxious for information, ready to cooperate, and on the whole, interested in applying information and considering new ideas to improve their farm family operations.

We wish to thank all of those who cooperated with this study, especially the staff of the Agricultural Extension Service, the Grand Rapids Experiment Station, and, particularly, the farm family members who participated in the interviews.

Case Studies

In addition to, and as a basis for this analysis, the FSR/E team members wrote case studies of each farm family interviewed. The following pages provide samples of these individual farm family case studies. These case studies are being used for further analysis, as well as for teaching and training activities. The names in the case studies are fictional.

Case One
Rapid Reconnaissance Survey
Case Example

Jeffrey & Shirley Larbach (not real name)
Wednesday, 4 p.m.

"To get to our place you go west of Cromwell...."

Jeffrey Larbach gave us good directions. It was easy to find his farm. The buildings had the appearance of being much used and time worn. The big, square two story house is partly aqua in color. There are still a couple of walls to paint.

The inside of the house had the feeling of many little jobs left undone. Every corner had a stack of something in it, i.e. sewing kits, books, clothes. The kitchen had been partially remodeled, but where the new paneling met the old the molding had not been installed. The colors in the rooms were rather dark. An electric bug light hung from the ceiling near the kitchen table on the way into the living room.

The Larbachs appeared to be in their late fifties. Although Jeffrey spent some of his early life in North Dakota, both he and his wife have spent most of their lives in the Tamarack area. When Jeffrey's grandfather immigrated from Germany to the United States, he came to Tamarack to farm. Jeffrey's father left the area to live in North Dakota. He returned to the Tamarack area when Jeffrey was small.

Jeffrey and his wife have been on this farm for 20 years. They have one son who still helps around the farm. Their daughter is married to a dairy farmer in Wright.

The Larbach's are dairy farmers. Jeffrey also works at the mill in a

nearby town. He points to the cast on his arm. "I have a good medical plan because I work at the Mill and that paid for this. That's something you can't get on the farm."

Jeffrey and his wife own 160 acres. Sixty acres of this land is tillable. Some of their land is too low and doesn't drain well. During haying they rent three "farms," equivalent to 80 acres of hay meadow.

Some of the land is wooded. They used to peel the poplar for sale to the Cloquet paper mill. Now it "doesn't pay." Today their primary use for wood is to heat the house.

Jeffrey and his wife are currently on the milk diversion program, but not sure where that program is headed. They milked twenty-two cows in 1982. This number has now been reduced to ten, five of which are "drying up." They use a pipeline milking system. The total herd today consists of nineteen heifers and one steer. They both like the diversion program. Jeffrey laughs, "I like it because I don't have to work so hard." Between farming and working at the Mill, Jeffrey says that he doesn't have any spare time. They do not participate in the Dairy Herd Improvement Association program.

Jeffrey uses a mixture of orchard grass and canary grass. He planted his orchard grass Memorial Day weekend. The canary grass is planted in the pasture. He feels that canary grass grows better in low ground and is very protein rich, although he has not had his forage tested for protein content. He has noticed a disappearance of flax in the area. There used to be a great deal of flax grown here. He plants some oats which he normally uses for nursery stock.

Buttercups and white daisies are present on their land. The daisies are most predominate in the older fields. Jeffrey thinks the "buttercups

came from the feed." He thinks they originated in the feed brought into the area from other places.

When asked about orange hackweed, he said he doesn't think there is any here, but he isn't sure what it is.

The hay is stored in both round bales and square bales. He prefers round bales because "they're less work in summer, but more work in winter." He cuts his hay with a hay knife. He has a New Holland round baler and a Vemeer square baler. He says the Vemeer makes tight bales. The square bales are kept in the hay loft. Jeffrey feels the need to use more fertilizer but can't afford it. He doesn't lime his field, but knows lime would help, and plans to "start doing it soon." Also plans to start using fertilizer.

When asked about plans for the future, his wife speaks up for the first time. She is vehement: she wants to "sell!" Jeffrey smiles nervously. He feels the farm is an investment to fall back on. She does most of the milking because he works at the mill. She's tired of farming.

They comment on the difficulty of farming today. She says:

"Now to make it in farming you've got to have everything paid and milk 35 head."

He adds that he'd like to farm full-time but:

"If I wasn't workin' out, the fields and such would be in better shape. I've always thought of farming full-time, but the way the milk price is, you can't figure to know what to do...."

He says he won't expand much more. He wants to build a machine shed and will continue to milk a few cows after he leaves the mill.

Mrs. Larch says their taxes are increasing too fast. She says this is due to the growing number of cabins on the lake which is at the end of their road. There are only two other farms that have cows along the road.

Some farmers have had to sell because they can't afford the higher taxes. Some of this farm land is now sold as lakeshore property. She says the lake is becoming "too crowded." Osborne and Ticklehoff, the Vikings football players, are on the lake, she says. The Boy Scouts have a lot of cabins there too.

They take "no vacations to speak of."

Mr. and Mrs. Larchach don't participate much in farm meetings and farm organizations. They do attend the annual coop and feed store meeting every year because it is a little more like a social get together.

Information the farm magazines and feed mills is considered important. The county extension office has also been helpful to them in the past. Mrs. Larchach has apple trees and plum trees. She has had some problems with them. There are only three good producing transparent apple trees left. Six young trees will soon be producing. The plum trees have a growth on them which is affecting them adversely. Mrs. Larchach called the county extension office about these problems and the possibility of spraying.

The Larchachs consider the REA (Rural Electric Association) rates to be exorbitant. They say REA is much higher than MP & L. They pay between \$143 and \$200 per month.

Jeffrey and his wife are energy conscious. They are siding, insulating, and shingling their house so it will be warm in the winter. According to the Larchachs, one possibility for research in the area would be on the feasibility of wind chargers. They would like to see an extension program on energy efficiency. "There's a guy around here who invented a heating system having the wood burner outside of the house. The copper tubing hooks into the existing furnace. The tubing is five dollars

a foot." Jeffrey and his wife were excited about this system because they felt it would be cleaner heat than their present system.

Mrs. Larch had been fairly quiet throughout the interview. She has only spoken to us a few times with bits of information. Near the table was a nice charcoal drawing. She smiled as she explained it was her work. Jeffrey was very proud of her drawing, he said.

As you look around the house you start noticing all of the home crafts in the room including latch hook rugs on the wall, plaster of paris art, ceramics, crewel pictures, needlepoint, long stitch, embroidery, crochet afgans, and so forth.

As she began talking about the different crafts in the house, we found out she sold crafts in kit form for a home craft company through the home party system. Suddenly she was more talkative as she became involved in showing a part of her life she really cares about. Mrs. Larch brought out kit after kit. Some of the designs were her own. She said she tried to sell the designs to a company but all they offered her was five dollars: "Ridiculous!"

Someday Mrs. Larch would like to have her own company. A friend is starting a knitting company in Wright. Mrs. Larch told her about some knitting machines used by another company that she thought would be good to use. As she continued, it seemed she enjoyed telling someone her dreams.

Although Mrs. Larch obviously spends hours and hours doing hand work, her work leaves an impression of unfinished business. The projects that are finished seem to have been hastily slapped into frames. Sometimes the pictures are crooked. Many times they are in the frames sloppily. Mrs. Larch has probably learned how to do the projects from instructions in the kits but needs instruction on the final stages for display.

Here are two hard working people who say they would have welcomed help in farm organization, management, and goal attainment in the past. Today they are facing old age and retirement with longings that really don't seem to match. Mr. Larchach seems to be looking forward to the time when he will be done at the mill and only have to work on the farm. Mrs. Larchach would like to be off the farm and is speculating about activities that would take her away from the farm and the farm chores she has been used to, but has come to dislike because of her craft interests. They're not sure what will happen to their farm.

CASE TWO

Interview with
Warren & Sharon Beaser

RAPID RECONNAISSANCE SURVEY CASE EXAMPLE

I. FARM FAMILY HISTORY

1. Warren and Sharon bought this farm 19 years ago when they married. Both were from farm families in the immediate area. Warren's parents farmed for 25 to 30 years--first near Benson, Minnesota, and then by Floodwood. When Warren's father moved to Floodwood, he worked in the mines and farmed, and eventually he was a full-time dairy farmer. Sharon's father had some animals and drove a school bus. She said he always worked two to three jobs at a time. Warren is a full-time farmer now, but for 8 years he hauled milk for the local creamery and then for 4 years he worked at Conwed in Cloquet. Conwed makes a variety of products such as mattress padding. Sharon and Warren seem to be between 35 and 40 years old.
2. The major change in the Bennett's farm operation has been to "get bigger to make a living"--renting more land and increasing the number of cows. This has occurred during the past 5 years. Warren feels that they work more now but get less money for their work because milk prices have dropped. Sharon said they can't participate in the milk diversion program because it would really hurt them financially to cut down on milk. They have four children--all daughters--who want to go to college. "Not with a family," Sharon said when talking about cutting down milk production.

II. CURRENT FARM SITUATION

1. Warren and Sharon own 200 acres and rent 200 acres. Not all of this is open pasture. Each year they plow 25 acres of corn and 25 acres for oats. All their rented land is in hay--mainly clover and orchard grass. They don't plant alfalfa because it lasts only two years. They have 80 acres in improved pasture. Every three years they alternate pasture by planting winter wheat and then seeding it down.

They started out farming by borrowing all the money for the farm. Sharon said that now they hand out money to young farmers, but they (Warren and Sharon) didn't get any help. Warren said his younger brother went bankrupt on his farm because the interest on credit is so high. Sharon said you pay three or four times for what you buy (when you consider the cost of interest).

Warren said, "What really hurt us is when corn prices went up." And, he said, PIK caused the price increase.

The creamery in Cromwell tests their milk. They sell it to Land 'O Lakes.

Sharon said somebody should check on the ASCS Board and find out why some people always get help and others don't. Warren said they have signed up for programs lots of times and haven't gotten anything because others have already been selected for the programs. Sharon said there're some loopholes some people must go through. She feels it's a waste of time to go down there to sign up--waste time, a whole day, and gas. Asked if this has always been the case, Warren said when they started farming there was "a good guy" on the ASCS Board who helped them, but he went off the Board and they haven't gotten help since. Sharon said

that one year their grain crop failed and they got some money for that. She added that they were honest and reported their actual loss while some others were not honest and were even going on vacations with their money for the lost crop. She wonders how they could get away with doing that.

They use woodlands just for firewood. They heat their house primarily with wood. Warren says that burning wood probably saves them about \$700 a year on fuel. They have 60 acres in woodlands.

If they plant any rye or wheat, it's for pasture.

To control weeds, they till them up. Warren said they don't have much problem with weeds--a little mustard. Sharon said, "Neighbor don't take care of his." She said she's gone out and pulled mustard to clean it out. She said some sprays don't work.

They have 30 cows and are milking all 30 now. They've had no trouble with calves aborting. Warren said with a (proud) laugh, "They say if you take care of your animals you'll have better luck." Warren and Sharon said they stay up at night when cows are calving and watch over things.

They have 3 Universal milkers and a bulk tank. They are Grade B and feel okay about that. Warren said that they are upgrading for B now (upgrading the standards). The 30 cows produce about 1,500 pounds a day--about 50 pounds a day per cow.

They don't have to buy fertilizer. Warren spreads manure on the fields right away except in the winter he piles it up and spreads it in the spring.

They harvest the hay by mowing and conditioning it and then baling it and putting it in the barn. They also feed pelletized feed which is delivered from Wadena. In the winter they feed more hay. They cut a lot of green chop in the fall. They've changed from haylage to corn silage.

They have a lot of rocks on the farm.

They said that only one farmer in the Meadowlands area has tile drained his farm.

2. All four daughters help Warren and Sharon with the farm work. The oldest two would like to farm "if there would be anything in it." Warren told them to "forget it." The girls are age 17, 16, 13, and 11. The oldest two help in the barn--feeding and clearing--and with haying. Sharon said she wants them to go to school (college) and "get decent jobs." Sharon helps with the milking and field work. A tractor turned over on her a year or two ago and she has shied away from tractor work a little since.

Warren mentioned that since they had land fill rather than dumps, bears have come onto the farm land in search of food.

Warren and Sharon call the vet only for vaccinations. They try to do all the other animal care themselves.

Sometimes they hire a couple young guys to help with baling. Warren said it's not hard to find people to hire although some are fussy about wages and want \$5 an hour because they feel they should get paid more than a CETA job pays which isn't as hard. Warren said he can't afford \$5 an hour. When he does hire, he prefers paying by load unloaded rather than by the hour. They also said the people they hire have to be farm boys--not from town--in order to know how to do the work.

Warren says he trades labor a lot--field work, fixing machinery, and fencing.

They do no custom work for others and share no machinery with others. Sharon said about sharing machinery: "That wouldn't work out." She said people try it and have personality problems or need to machinery at the same time.

3. All their income comes from farming and has for the past 5 years.

They don't sell any crops.

They have a big garden. "Have to," Sharon said. They butcher their own meat and have three food freezers.

They've never had to worry about marketing milk. The milk prices have gone down a little--from 12.45 to 11.60. Their butterfat test went up this year from 3.2 to 3.8. They don't know why for sure, but think it might be due partly to having had someone stealing their milk before and taking much of the cream.

They seemed unhappy with having to pay the CCC 50¢ on every 100 lbs.

III. FARM PURPOSE AND PROBLEMS

Both Warren and Sharon said they'd like a new house. They painted much of the inside this spring--at least partly due to their oldest daughter's high school graduation and accompanying social events. The house is rotting, they say. The basement fills with about 3" of water in the spring. The house is close to 100 years old.

They would like to clear more land if it would benefit them. But if they are forced to cut back production, the cleared land will not benefit them. Sharon said it doesn't make sense that they (the government) want them to cut back but they (the government) help others start out.

They would like to add on to the barn and have more cows. And they would like to have a full line of machinery and a barn cleaner.

What kind of life do they want for their children? "Not as hard work." They want them to go to college. The oldest graduated from high school this spring and will go to UMD this fall to study legal accounting.

Warren and Sharon are not in favor of consolidating school districts because time is wasted on the bus and kids who have any trouble don't get taught as well in a large school. Warren said he has and still is thinking about selling the farm and moving somewhere where their girls would get better schooling. He's waiting to see if proposed changes in the Floodwood school curriculum will take place. Warren and Sharon are displeased because the school is planning to take computers out of the curriculum. Their daughters like math and computers.

They don't think their daughters will end up farming.

Warren said the only thing he likes about farming is the independence. Then Sharon said you don't feel independent when they tell you what to do.

Warren said the only thing they need is more money. He would like to clear more land so they wouldn't have to rent.

Sharon said she would like to see all kids in school learn about farming--not the technical information on how to farm but about farming in general. "They call farmers dummies. They think vegetables come from the store." They don't understand that a farmer has to put everything back into the farm.

Asked if their daughters took VoAg in school, Warren said they hadn't because the majority in VoAg are boys. Their girls are taking college prep classes.

Warren and Sharon think government programs should be scrapped if certain people always get the benefits from them and can invest in farms for tax deductions.

There are no farm organizations in the area.

IV. INFORMATION SOURCES

1. Warren said he's never had to have information. He said he tries to work out everything himself. Sharon said they learn from mistakes.

Sharon said that on a farm kids learn they have to do what they're told.

Warren said that he gave each girl a cow when the girl was in 3rd or 4th grade. The girl takes care of it and weighs the milk produced and gets the money from that milk as an allowance. She also gets to keep any heifers born to the cow or gets money from bulls born to the cow. They use the money for clothes and other things and for college.

The girls haven't been in 4-H. Sharon said they don't have time for it because of their chores and school work.

2. Warren said Extension "Never helped me in the last 15 years." He thinks Extension should quit giving help only to certain people and should cut down on the paper work it requires for programs.

Sharon said, "Really, in farming there ain't enough for your expenses." You don't get paid vacations. You don't have time to read everything.

3. They would like to see research on the whole farming operation so that when you're all done farming you'll have something for it.

Warren says he knows why alfalfa won't grow--they need more lime in the soil. He said he'd grow soybeans if he had more land. He tested them and found they'd grow well on his farm.

Warren has had their soil tested. Said they have no drainage problems. They have 72-day corn from Canada.

They don't lime much and don't plant alfalfa.

V. COMMUNITY OVERVIEW

Warren: It's a pretty good area, "sort of peaceful," don't like big cities.

Sharon: "We've never liked big cities."

Warren said people like it here but farmers are leaving because they're not making it. With fewer farmers, it costs more to get products moved.

Sharon, "It's all right up here."

Warren said he wishes there would be more money in farming so you could replace machinery as needed. He would like the security to do what he wants to do.

GENERAL IMPRESSIONS OF THE BENNETT FARM

The farmstead is very neat--no weeds, machinery lined up. Although the house is almost 100 years old and rotting according to Warren and Sharon, it is well cared for and very clean.

On-Farm Trials
Northeast Minnesota FSR/E Project
January, 1985

The Northeastern Minnesota FSR/E Project has reached the adaptive on-farm research stage. Following six months of discussion and planning, including consultation with Grand Rapids Experiment Station staff and Northeast Extension staff, the interdisciplinary FSR/E Project team undertook the "sondeo" (informal diagnostic survey) reported in the preceding sections of this report. The findings from the survey constitute the diagnostic phase of an FSR/E project. The next phase consists of using those findings to carry out on-farm trials aimed at adapting existing knowledge to this area to discover a technological intervention that can be disseminated to area farmers with confidence that it is appropriate to the area family farming system and that it will increase the efficiency and optimal use of resources in area farming operations.

The first step is more clearly delineating the recommendation domain. We shall work in the relatively homogeneous agriecological zone representing the trough off of Lake Superior. That agriecological zone will be narrowed to ideally include at least one hundred serious dairy farmers. A "serious" dairy farmer is a full-time dairy farmer or a farmer who realizes a significant amount of income from the dairy operation. In addition, farmers who would like to be full-time dairy farmers, or who are striving to realize significant income from dairy farming, are also "serious" farmers.

Because they live in the area, Dave Rabas (Experiment Station), Lee Raeth (Extension), and Marv Mickelson (FSR/E Extension Assistant) will make the final decision about the boundaries for the Northeast Minnesota FSR/E

project. Based on discussions that we had about the recommendation domain, and using the plot maps from the sondeo interviews, Lee and Marv will draw the boundaries based on townships, and get agreement from Dave Rabas about those boundaries.

As soon as the boundaries are established, Marv Mickelson will work to establish a list of all "serious" dairy farmers within those boundaries. We will establish a meeting date when interested farmers can come together to discuss options for on-farm research. We will send a letter explaining the purpose of the project and some of the on-farm research options to all farmers in the target area inviting them to this meeting. Marv and Lee will also begin paving the way for this meeting through their own contacts. At that meeting farmers will be presented with our on-farm research proposal.

The on-farm research will initially focus on establishment of Birdsfoot trefoil as a forage legume. We aim to have approximately fifteen farms participate in on-farm research of up to one acre. The research will focus on variations in seed bed preparation, fertilizer applications, and weed control. Farmers will be invited to discuss their own interests and concerns about variations in establishment practices. At this point the target date for planting would be ten days in late June/early July. The difficulty with this time period is it is also the time when farmers are cutting hay, and seeding at that time may go against local norms. There are also risks with regard to rainfall during that period. The purposes and potential of the on-farm trials will be discussed with farmers and the final decision about which trials to conduct will include farmers' interests.

We agreed that we would seek funds for seeding, chemical control of

quack on Spring plowed areas, and fertilizer. Seed would cost approximately \$25 per acre; chemicals for weed control would cost approximately \$10-\$25 per acre; and fertilizer would cost approximately \$20 per acre. With other incidental costs, it would seem that we are talking no more than \$100 per acre. With fifteen potential farm participants, this means \$1,500 in supplies for the on-farm research.

Marv Mickelson, our FSR/E Extension Assistant, will be responsible for overseeing the trials. Marv will work directly under Lee Raeth and Dave Rabas. We will seek additional funds for Marv's continuing participation in the project beyond September since there will be data to be collected and work to be done over several years.

Forage Storage Survey

Another thrust of the project will be a forage storage survey. All the farmers who fit our definition within the boundary recommendation domain will be surveyed for forage storage practices. The forage storage survey will be developed by the team. It will include questions on (1) preservative use, (2) size of stacks, (3) type of bales, (4) drying techniques, (5) facilities for storage, and (6) cutting dates. The purpose of this survey is to gather additional information to explore the possibility of on-farm research regarding storage techniques and cutting dates.

Both the on-farm trials for Birdsfoot trefoil and the survey of forage cutting and storage fall within the overall priority identified in the initial sondeo, namely, to improve forage quality for dairy farming. Forage improvement will support greater productivity and profitability for dairy farming in the area.

Other Data

The sondeo was broadly aimed at a variety of issues. We have focused initially on forage improvement as the focus for on-farm research. In addition, we will want to move forward with further specification of the farming system(s) in the area. This means that the team will want to consider collection of additional data about the farm families, the community, marketing, and other aspects of the systems and subsystems. In addition, we shall want to conduct a policy study gathering data from community leaders, policy makers, and people in professional positions who have an opportunity to reflect on and affect the policy context. The FSR/E seminar during the Spring will be a focus of some of these data collection efforts. All team members will be invited to participate in developing relevant instruments and data collection field efforts.

As we conceptualize additional data collection and long-term FSR/E objectives, we shall need to begin to focus on developing funding sources supportive of specific pieces of the FSR/E project.

We are now posed to move forward in implementing the next stage of the Minnesota FSR/E project. The upcoming months should be challenging for the team as we move from FSR/E theory into FSR/E practice.

Project Goals

1. Pilot test FSR/E theory and methods in Minnesota
 - a. Identify the strengths and weaknesses of FSR/E in a Minnesota application.
 - b. Identify the costs and benefits of FSR/E in a Minnesota pilot test.
2. Put Minnesota at the forefront of domestic FSR/E development and implementation.
 - a. Attract new research and extension resources to Minnesota through FSR/E innovativeness and national prominence.
3. Train Minnesota faculty, research staff, extension personnel, and students in FSR/E theory and methods.

- a. Provide direct field experiences to University staff and students in FSR/E.
 - b. Develop training, teaching materials, and course curricula based on Minnesota's FSR/E experiences.
 - c. Prepare Minnesota staff and students for the growing opportunities in international agricultural development based on FSR/E.
 - d. Increase the competitiveness of the University of Minnesota bidding on U.S.AID FSR/E projects.
4. Optimize the use of resources in the family farm system of the targeted area in Northeast Minnesota.
- a. Increase the quality of forage used.
 - b. Determine the forage species and practices most appropriate to this system.
 - c. Identify a technology package in forage production that is acceptable to and that will be adopted by area farmers.
 - d. Increase the profitability of area dairy operations through minimum inputs to achieve efficient production.

Implementation Proposal

The first phase of diagnostic survey revealed that low quality, inefficient forage production is a critical element limiting targeted farmers' efficiency and productivity. Problems include:

- use of low yield forage species
- production of low protein forage (8% - 9%)
- reluctance to lime because of high costs thus limiting alfalfa appropriateness
- very short growing season
- wet conditions, much low lying land
- unfavorable harvest conditions at optimum harvest time
- high costs of feed grains and limited capability to produce grains
- poor storage and preservation practices

These and related problems discussed in the "sondeo" findings lead the FSR/E project team to believe that improved forage production is a critical leverage point for intervening to improve overall dairy production efficiency and profitability. The team proposes conducting on-farm trials to develop an appropriate forage technology package for area farm families.

While selection of actual trials will require consultation with campus specialists, experiment station staff, area extension agents, and farmers,

the characteristics of the desired forage include:

- long stand life
- not pH specific
- a forage legume
- not restricted by internal soil drainage, i.e. wet soils
- seed readily available
- new to the area to avoid stigma and biases
- maintains quality after reaching maturity, i.e. protein and digestibility
- can withstand temperature and moisture extremes

Birdsfoot trefoil is an example of a forage legume that has the desired characteristics, but is untested in the target area. Since birdsfoot trefoil is slow to establish in the first year, on-farm trials might include variations in establishment practices to improve stand establishment, forage quality, and species acceptability to area farmers. On-farm trials might also evaluate alternative grain species and varieties.

While on-farm trials are being conducted, simultaneous and related FSR/E activities would include:

1. collecting additional agricultural, economic, and household data to more accurately and holistically characterize the farm family system in this area;
2. developing related and supporting research/extension activities, e.g., work on family stress, farm management, dairy practices, farmer groups, information dissemination approaches, drainage improvement, alternative cash crops, and policy/infrastructure reviews; and
3. evaluation of FSR/E including baseline and follow-up data.

Key Points

1. On-farm trials must be sufficiently rigorous to meet minimal scientific standards for research.
2. The on-farm trials are the centerpiece around which supporting research and extension activities revolve.
3. FSR/E involves close collaboration among FSR/E project participants: experiment station staff; extension; campus specialists; the interdisciplinary FSR/E project team; and area farm families and farmer organizations.
4. An FSR/E approach involves a 3 to 5 year commitment.
5. The on-farm trials constitute adaptive research first and foremost; these are not simply demonstrations.
6. On-farm trials have two primary purposes:
 - a. subject the technology to a wide range of environments and

- management practices; and
- b. get farmer evaluation of the technology.

Resource Needs

Careful examination of the North Florida FSR/E experience indicates that successful on-farm trials require:

- an on-site, living-in-the-area, full-time FSR/E research/extension staff person to work with farmers in establishing, monitoring, and evaluating the trials;
- experiment station assistance in establishing the on-farm plots;
- substantial campus backstopping and institutional support;
- integration in the area extension structure;
- dual reporting/responsibility to extension and the experiment station;
- incentives/risk reduction calculations for farmers;
- close collaboration with farmers including a farmer advisory group;
- adequate implementation resources;
- adequate time; and
- a plan for institutional evaluation

APPENDIX I

Northeastern Minnesota FSR/E Project Farm Interview Guide Used in the Sondeo, June, 1984

I. FAMILY FARM HISTORY

1. How long have you and your family been farming here?

Probes

- a. How did your family pick this area for farming?
 - b. How did you get started?
2. What have been the major changes in your family's farming operation during the last 3-5 years?

Probes

- a. How did those changes come about?
- b. How do you feel about these changes?
(Progress, decline, good, bad.....)

II. CURRENT FARM SITUATION

1. Tell me about your current farming operation.

Probes

- a. Farm size/# acres
 - b. How much owned/rented?
 - c. Crops
 - d. Animals
 - e. Pasture
 - f. Woodlands
 - g. Method of weed control
2. What's your farm labor situation? Who does the various farming jobs?

Probes

- a. What role does each family member play in the farm operation?
- b. What non-family labor is used? When?

3. What proportion of the family income comes from farming?

Probes

- a. What are other sources of income?
- b. Has farming proportion been increasing, decreasing, or staying the same?

4. What do you do with what you produce on the farm?

Probes

- a. How is forage used? frequency of harvest?
- b. What is produced for household consumption?
- c. What is sold? Where? When?
- d. How has the market situation changed in the last 3 years? Where's it seem headed?

III. FARM PURPOSE AND PROBLEMS

1. You've given me some excellent background on your farm's history and your current operations. Now I'd like to have you think about the future.

If you could control things somewhat the way you'd like, but being realistic, what would you like to have happen for you and your family over the next three years?

Probes

- a. How would you like to see your farm operation change?
- b. How do you expect your income sources to change proportionately - more from the farm, less from the farm, the same....?
- c. How would you like to see your family situation or lifestyle change over the next 3-5 years?
- d. What kind of life do you expect for your children?
- e. How does your farm fit into your hopes and dreams for the future? and for your children?

2. Given what you've said about the future, what problems do you need to deal with to achieve your hopes? What problems might keep you from accomplishing what you want?
 - a. farm operation problems
 - b. production problems
 - c. marketing problems
 - d. family situation
 - e. credit problems
 - f. government policy problems
 - g. land problems
 - h. technical limitations
 - i. knowledge limitation (things you'd like to know more about)
 - j. support services

IV. INFORMATION SOURCES

1. Where do you usually get information to help you deal with the problems you've mentioned?

Probes

- a. What are your primary sources of information on farm practices?
 - b. What farm organizations do you belong to? How active?
 - c. Where do you get information and advise about family life and problems?
 - d. What organizations in the community do you belong to? How active?
2. What have been your experiences with the Agricultural Extension Service?
 - a. How could the Extension Service be of greater use to you?
 3. What kind of agricultural or related research would you like to see the University do in this area that might help your farm operation?
 - a. research on soils?
 - b. research on crops?
 - c. research on animals?
 - d. research on markets?
 - e. research on government policies?
 - f. research on farm family life?

V. COMMUNITY OVERVIEW

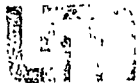
We've talked a lot about your farm and family, let me shift now to the larger community. Say I was thinking about settling in this area as a farmer.

1. What would you tell me about the pluses and minuses of this area as a place to live and farm?

Probes

- a. What are the good things about life here?
 - b. What are the not-so-good things?
2. Anything else you would add on any aspect of what we've talked about to help me understand your farm operation, your family situation, this community, or whatever...?

APPENDIX I
AGRICULTURAL EXTENSION SERVICE



UNIVERSITY OF MINNESOTA

Institute of Agriculture, Forestry and
Home Economics
St. Paul, Minnesota 55108

May 31, 1984

St. Louis County Sheriff's Office
Court House
Duluth, MN 55802

Dear Sheriff:

This letter is to inform you that the University of Minnesota is interviewing farmers in your area in cooperation with your county extension office. The interviews will be conducted the first two weeks of June. A copy of the interview is enclosed.

The interviewers are:

Dr. Vernon Cardwell
Dr. Martha Gaudreau
Dr. Jane Plihal
Dr. Sonia Patton
Dr. Michael Patton
Carol Pogue
Laura Brophy
Robert Hassell

The purpose of the interview is to improve the relevance of the University's farming research in your county.

We are writing you in case any questions are raised about the legitimacy of the interviews. Please send copies of this letter to the appropriate offices in your county.

Thank you for your assistance.

Sincerely,

A handwritten signature in cursive script that reads "Michael Q. Patton".

Michael Q. Patton
Farming Systems Project Director
University of Minnesota
(612) 376-3974

MQP/pmd

cc: David Radford
Arnold Heikkela

Northeastern Minnesota
FSR/E Project
Policy Interview Guide
DRAFT

1. Let me begin with a somewhat general but very important question. What do you do that affects farming in this area?
 - a. How does what you do affect farming?
2. We're particularly interested in the corner where South St. Louis, Aitkin and Carlton counties come together - the communities around Floodwood, Tamarack, and Cromwell.

What's your assessment of the quality of farming in that area?

 - a. What do you believe is the potential for improvement in that area?
3. From your perspective what are the major problems of farm families that area?

Probes

- a. Production problems
 - b. Soil problems
 - c. Credit problems
 - d. Market problems
 - e. Family issues
4. In your area of expertise and responsibility, what are the major policies and programs that affect farm families in area?
 - a. How effective are those policies or programs?
 - b. How would you like to see them changed?
 5. What's your assessment of the effectiveness of University of Minnesota Agricultural Extension Services in this area?
 - a. How would effectiveness be improved?
 6. What kind of agricultural or related research would you like to see the University do in this area that might help improve the quality of life here?
 7. Say I was thinking about settling in the Floodwood/Tamarack/Cromwell area as a farmer. What would you tell me about the pluses and minuses of this area as a place to live and farm?
 - a. What are the good things about life here?
 - b. What are the not-so-good things?
 8. What should I have asked you that I didn't ask that would help me understand this area? What else should I know?

Appendix III
FSR/E Teaching and Training Activities
University of Minnesota

In August, 1984, University of Minnesota FSR/E faculty conducted a one week workshop on FSR/E in cooperation with the Farming Systems Support Project of the University of Florida. In the Winter and Spring, 1985, University of Minnesota FSR/E faculty have been team teaching an introductory course and follow-up graduate seminar on FSR/E. The course and seminar are cross-listed in the College of Agriculture, College of Home Economics, and College of Education (Departments of Agricultural Education and Home Economics Education).

The Appendices which follow provide the course and workshop outlines by way of documenting Minnesota's FSR/E teaching and training activities and approaches.

Course Proposal
Home Economics 5-000
Introduction to
Farming Systems Research and Extension
3 credits

Course Description

This course will introduce students to the theory and practice of Farming Systems Research and Extension (FSR/E). FSR/E is an interdisciplinary approach to research aimed at a wholistic view of the farm family agricultural enterprise. Research and extension are integrated through on-farm, adaptive research with farmer participation. FSR/E is particularly well-suited for working with small, limited resource farm families.

There are many job opportunities opening up for people with expertise in FSR/E, especially in current U.S.AID contracting. This course would introduce students to FSR/E in sufficient depth that they could intelligently discuss FSR/E theory and practice. A follow-up seminar would involve actual Farming Systems field research.

For Whom Intended

Students interested in agriculture and home economics extension or education; family farm studies; farm management; international development; integrated rural development; and interdisciplinary approaches to family farm production and related research.

Student Performance Objectives

Students will:

1. be able to distinguish FSR/E from other approaches to agricultural research and extension;
2. know the stages and components of FSR/E;
3. understand the particular constraints faced by limited resource farm families both domestically and internationally;
4. know how to integrate the sub-systems of the farm household (family system), crops, animals, and markets into a wholistic view of the farm family enterprise;
5. know how to conduct a sondeo;
6. know how to work with and educate farmers to plan on-farm, adaptive research;
7. understand the educational possibilities, implications and underpinnings of Family Farm Systems Research and Extension in working with family farm members;
8. know how to integrate on-farm research, experiment station research, educational efforts and extension at the farm family level;
9. know how Farming Systems Infrastructure and Policy (FSIP) relates to FSR/E;
10. be familiar with the emerging literature on FSR/E;
11. understand the role of FSR/E in Third World Development; and
12. understand the role of FSR/E in U.S. agricultural and rural development.

Course Outline
(Assumes twenty 1-1/2 hour sessions)

- Session One: The Emergence of FSR/E: History and Context
- Particular emphasis will be placed on the need to integrate an understanding of the rural family system with technical agricultural analysis in the context of a particular culture and community.
- Session Two: The Stages of FSR/E
1. The sondeo: characterizing the family farm system
 2. Planning on-farm research in collaboration with farm family members
 3. Developing a technical package congruent with the farm family system
 4. Extending that technical package with sensitivity to the family farm system
- Session Three: The Sondeo: Gathering Information to Characterize a Farming System
- Session Four: Farming Systems Examples: The North Florida Project
- Session Five: The Northeastern Minnesota FSR/E Project
- Session Six: International Examples of FSR/E Projects: The Caribbean, Rwanda, Central America (CIMMYT), IITA, and IRRI.
- Note: Sessions four through six will include review and criticisms of past FSR/E efforts, particularly the frequent failure to build in a meaningful family systems analysis and weak linkages with extension.
- Session Seven: The Sub-systems of FSR/E: The Household (Family System), Crops, Animals, and Markets
- Session Eight: Family and Household Systems Analysis in the FSR/E Framework
- Session Nine: The Crops Sub-system of Limited Resource Family Farms
- Session Ten: The Animal Sub-system of Limited Resource Family Farms
- Session Eleven: The Market Sub-system as it relates to Limited Resource Family Farms
- Session Twelve: Bringing sub-systems together for a Wholistic Perspective on the Family Farming System

- Session Thirteen: Building an Interdisciplinary FSR/E Team
- Session Fourteen: Planning and Conducting On-Farm Trials Including Attention to Household and Family Factors Which Affect Outcomes
- Session Fifteen: Examples of FSR/E On-Farm Trials
- Session Sixteen: Farm Family Members as Collaborators in On-Farm Trials
- Session Seventeen: The Linkages Between Extension and Farming Systems Research

This session will include examination of linkages between various extension specializations (Home Economics, Agriculture, 4-H/Youth Development, and Community Resource Development) and traditional research perspectives as well as attempts to integrate perspectives in an FSR/E framework.

- Session Eighteen: Farming Systems Infrastructure and Policy Analysis (FSIP)
- Session Nineteen: Strengths and Weaknesses of FSR/E and FSIP
- Session Twenty: Future Directions for Farming Systems Research and Extension

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Extensive Bibliography attached

Instructors

The course will be team taught. Primary course responsibility for coordination, administration, planning, and curriculum will rest with Professor Michael Q. Patton, Agricultural Extension Service. Other likely course instructors and collaborators will include: Mimi Gaudreau, Soils; Jane Plihal, Home Economics Education; Sonia Patton, Anthropology; Delane Welsch, Agricultural and Applied Economics; Vernon Cardwell, Agronomy; Gene Pilgram, Farm Management; Janice Hogan, Family Social Service; Shirley Baugher, Home Economics Extension; and Merriam Seltzer, Youth Development.

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Whyte, W. F. Participatory Approaches to Agriculture Research and Development: A State-of-the-Art Paper. Ithaca: Cornell University, Center for International Studies, Rural Development Committee, 1981. (Special Series on Agriculture Research and Extension, 1) 111 p. [No 3250 AE]

Zandstra, H. G., et al. Caquezas: Living Rural Development. Ottawa: IDRC, 1979. (IDRC, 107e) 321 p. [309.263 C175]

Zandstra, H. G., et al. A Methodology for On-Farm Cropping Systems Research. Manila: IRRI, 1981. 96 p. []

Consultative Group on International Agriculture Research. Technical Advisory Committee. Farming Systems Research at the International Agricultural Research Centers. Washington, D.C.: TAC Secretariat, 1978. 176 p. []

International Workshop on Socio-Economic Constraints to Development of Semi-Arid Tropical Agriculture. Proceedings. Patancheru: ICRISAT, 1979. 435 p. [338.10913 In8]

Spurgeon, D. Hidden Harvest: A Systems Approach to Post-Harvest Technology. Ottawa: IDRC, 1976. 36 p. [STP]

Symposium on Farming Systems Research. Washington D.C.: USDA, Office of International Cooperation and Development, 1980. 196 p. []

CATIE. Control integrado de plagas en sistemas de produccion de cultivos para pequenos agricultores. Turrialba: CATIE, 1979. (v.1: 311 p., v.2: 302 p., v.3: 151 p.) [632.55 C7673]

International Workshop on Farming Systems. Proceedings. Hyderabad: ICRISAT, 1974. 548 p. [630.915 In85]

Kass, D. C. L. Polyculture Cropping Systems: Review and Analysis. Ithaca: Cornell University, 1978. (Cornell International Agriculture Bulletin, 32) 69 p. []

Delgado, C. L. The Southern Fulani Farming System in Upper Volta: A Model for the Integration of Crop and Livestock Production in the West African Savannah. East Lansing: Michigan State University, Department of Agricultural Economics, 1979. (African Rural Economy Paper, 20) 185 p. [Serial]

Introduction to
Farming Systems Research and Extension

Course Outline

Session One: The Emergence of FSR/E: History and Context
Jan. 8

Particular emphasis will be placed on the need to integrate an understanding of the rural family system with technical agricultural analysis in the context of a particular culture and community.

Readings: Shaner et al, Chapter One
Flora, Cornelia Butler, Farming Systems Research and the Land-Grant System: Transferring Assumptions Overseas
Norman, David W., "The Farming Systems Approach to Research"

Session Two: The Stages of FSR/E
Jan. 10

1. The sondeo: characterizing the family farm system
2. Planning on-farm research in collaboration with farm family members
3. Developing a technical package congruent with the farm family system
4. Extending that technical package with sensitivity to the family farm systems

Readings: Shaner et al, Chapter Two
Caldwell, John, "An Overview of Farming Systems Research and Development: Origins, Applications and Issues"

Workshop
Session:
(6 hours
during the
weeks Jan.
14-25)

The Sondeo, Recommendation Domains, and Designing On-Farm Research from a Holistic Perspective

Readings: Rhoades, "The Art of the Informal Survey"
Patton, "Qualitative Interviewing"
Shaner et al, Chapters Three & Four
Hart and Bernstein, "Initial Design of On-Farm Trials"
Lightfoot, "On-Farm Experiments in Farming Systems Research"
Shaner et al, Guidelines Appendices 6: C - F
7: A - E
IITA, "Moving Research to Farmers' Fields"

Workshop
Session:
(6 hours
during the
weeks Jan.
28 - Feb. 8)

From On-Farm Research to a Technical Package, and the
Linkages Between Research and Extension.

Readings: Shaner, Chapters 5 & 7
Hildebrand, "The Role of On-Farm Research in
Technology Generation"
Shaner et al Guidelines, Chapter 8
Appendices 10 A - B
Norman & Hayes, "Developing a Suitable
Technology for Small Farmers"

February 12:

Family and Household Systems Analysis in the FSR/E
Framework

Readings: McKee, Catherine, "Methodological Challenges in
Analyzing the Household in Farming Systems Research:
Intra-Household Resource Allocation"

February 14:

The Market Sub-system as it Relates to Limited Resource
Family Farms

Readings: Shaner - Guidelines, Appendix 5-C

February 19:

The Crops Sub-system of Limited Resource Family Farms

Readings: Shaner, Chapter 6

February 21:

The Animal Sub-system of Limit Resource Family Farms

Readings: Hart, "Crop/Livestock Interactions as Crop
Production Determinants"
Bernsten, "Livestock in Farming Systems Research"

February 26:

Bringing Sub-systems Together for a Holistic Perspective on
the Family Farming System

Readings: Shaner et al, Chapter 8

February 28:

Examples of FSR/E Research and Special Topics

Readings: Shaner, Chapter 5
Cimmyt Publications

- March 5: Building an Interdisciplinary FSR/E Team
Readings: Shaner et al, Chapter 9
Shaner, Guidelines, Appendix 10 C - D
- March 7: Farming Systems Infrastructure and Policy Analysis (FSIP)
Readings: Waugh et al, "Institutional Assessment for
Implementing a Systems Approach to Agricultural
Research and Extension"
- March 12: Strengths and Weaknesses of FSR/E and FSIP
Readings: Shaner et al, Chapter 10
- March 15: Future Directions for Farming Systems Research and Extension
Readings: Byerle et al, "Farming Systems Research: Issues
in Research Strategy and Technology Design"
Cernea et al, "Is Anthropology Superfluous in
Farming Systems Research?"

Course Proposal

College of Agriculture 5-
Seminar: Applications of
Farming Systems Research and Extension
3 credits

Course Description: A seminar in which students do fieldwork projects using a Farming Systems perspective. Students will interview farm families and relevant professionals, conduct a Sondeo, and characterize a farming system. On-farm trials will be designed. Extension and experiment station staff will be involved in the conceptualization of the projects.

For Whom Intended

Students who have taken Home Economics 5-000 and want concrete farming systems field experience.

Student Performance Objectives

Students will plan and implement a Farming Systems Research and Extension Project in close collaboration with faculty.

Students will know how to characterize a family farming system with a wholistic view of the family farming system and farm operation.

Students will know how to work with extension and experiment station staff in planning and implementing a farming systems project.

Students will know how to analyze sondeo data to design on-farm trials taking into account the family system and family farm goals.

Students will know how to work together as an interdisciplinary team in close collaboration with interdisciplinary faculty.

Course Assignment and Evaluation Procedures

Students will conduct and analyze FSR/E sondeo interviews under close faculty supervision.

Students will prepare project papers on actual family farm systems.

Text and Reference Materials

Required readings attached. The precise academic and scholarly content of the course will depend on the backgrounds, disciplines, and experiences of seminar participants. The seminar will be methodologically rigorous with the precise focus dependent on student disciplines and needs.

Contact Hours Per Week

Two hours of class time plus substantial fieldwork.

Instructors

The course will be team taught. Primary course responsibility for coordination, administration, planning, and curriculum will rest with Professor Michael Q. Patton, Agricultural Extension Service. Other likely course instructors and collaborators will include: Mimi Gaudreau, Soils; Jane Plihal, Home Economics Education; Sonia Patton, Anthropology; Delane Welsh, Agricultural and Applied Economics; Vernon Cardwell, Agronomy; Gene Pilgram, Farm Management; Janice Hogan, Family Social Service; Shirley Baugher, Home Economics Extension; and Merriam Seltzer, Youth Development.

required readings:

Appleby, Gordon

- 1976 The role of urban food needs in regional development, Puno, Peru. *Regional Analysis, Vol. I: Economics Systems*, Carol A. Smith (ed.) New York: Academic Press. Pp. 147-198.

Behnke, Roy and Carol Kerven

- 1983 FSR and the Attempt to Understand the Goals and Motivations of Farmers. *Culture and Agriculture issues* 19. Spring 1983, pp. 9-16.

Butler, Lorna M.

- 1983 Putting Farming Systems Research Data Collection in Perspective. Presented at the Farming Systems Symposium, Kansas State University, Manhattan Kansas, Oct. 31 - Nov. 2, 1983.

Chambers, Robert

- 1979 Circumstances of Poor Farm Families in the Tropics. (exerpted).

CIMMYT

- 1980 Planning Technologies Appropriate to Farmers' Concepts and Procedures. Mexico City: International Maize and Wheat Improvement Center, Economics Program.

Conklin, Frank S.

- 1983 "FSRE as a Field Methodology in Third World Countries: Its Historical Origins, Current Functions and Suggestions for Improvement," in Cornelia Butler Flora (ed.), Farming Systems in the Field: Proceedings of Kansas State University's 1982 Farming Systems Research Symposium. Manhattan, Kansas: Kansas State University.

Frankenberger, Tim

- 1983 Animals in a Farming System in North Kordofan Sudan: Integrating Short-term and Long-term Perspectives in FSR Approaches. Presented at the Farming Systems Symposium, Kansas State University, Manhattan, Kansas, Oct 31 - Nov. 2, 1983.

Freeman, John and Michael T. Hannon

- 1983 Niche width and the dynamics of organizational population. American Journal of Sociology, 88(6): 116-11145.

Gilbert E. H., P. W. Norman, and F. E. Winch

- 1980 Farming Systems Research: A Critical Appraisal. (MSU Rural Development Paper No. 6), East Lansing: Michigan State University, Department of Ag Economics.

Gostyla, Lynn and Wm. F. Whyte

- 1980 ICTA in Guatemala: The Evolution of a New Model for Agricultural Research and Development.

Other required readings: (cont.)

Greenwood, Davydd

- n.d. Contextualizing the factors of production: baseline data for the study of family farming. In R. Laura Batt and Billie R. DeWalt (eds.), *Social Sciences in the Planning Process: Baseline Data Collection in Developing Countries*. University of Kentucky, Center for Developmental Change.

Hart, Robert D. and Calixte George

- 1983 A guideline for the design of farming systems projects: a case study from the Eastern Caribbean. Presented at the Farming Systems Research Symposium at Kansas State University, Manhattan, Kansas, October 31- November 2, 1983.

Hildebrand, Peter R.

- 1980-81 "Motivating Small Farmers, Scientists, and Technicians to Accept Change," Agricultural Administration, 9.

McDowell, R.E. and P. E. Hildebrand

- 1980 *Integrated Crop and Animal Production: Making the Most of Resources Available to Small Farms in Developing Countries*. New York: Rockefeller Foundation. (Working Papers).

Norman, David W.

- 1983 The Farming System Approach to Research, IN: Proceedings of Kansas State University's 1982 Farming Systems Research Symposium. Paper #5. April 1983, pp. 7-19.

- 1983 Some problems in the implementation of agricultural research projects with a farming systems perspective. Presented at a seminar on The Introduction of On-Farm Research with a Farming Systems Perspective, Nairobi, Kenya, April 16-20, 1983.

Norman, David W., Emmy B. Simmons and Henry M. Hays

- 1982 *Farming Systems in the Nigerian Savanna: Research and Strategies for Development*. Boulder, Colorado, Westview Press.

Nygaard, David

- 1983 Tests on Farmer Fields: The ICARDA Experience, IN: Proceedings of Kansas State University's, 1982 Farming Systems Research Symposium, Paper #5, April 1983, pp. 76-98, C. Flora (ed.).

Oasa, Edmund

- 1983 "Farming Systems Research: A Case on the Politics of Agricultural Research."

Ortiz, Sutti

- 1980 Forecasts, decisions and the farmer's response to uncertainty. In Peggy F. Barlett (ed.) Agricultural Decision Making. New York: Academic Press. Pp. 177-202.

Other required readings: (cont.)

Pearse, Andrew

1977 "Technology and Peasant Production: Reflections on a Global Study,"
Development and Change, 8 (April).

Reeves, Edward B.

1984 Marketing Analyses and Farming Systems Research.

Richards, Paul

1983 Farming systems and agrarian change in West Africa. Progress in Human Geography, 7(1): 1-39.

Rhodes, Robert E.

n.d. The Art of the Informal Agricultural Survey (pp. 16-53).

Shaner, W.W.

1983 Stratification: An Approach to Cost-Effectiveness for Farming Systems Research and Development. Proceedings of Kansas State University 1982 Farming Systems Research Symposium, paper #5, April 1983. C. Flora (ed.), pp. 162-181.

Sprague, Howard B.

1981 The Status and Challenge of Dryland Agriculture in Developing Countries of the Tropics and Subtropics. Washington: USAID, Rural Development Division.

Vincent, Warren H.

1982 Small farm characteristics, problems, and programs in the Third World, IN: Proceedings of Kansas State University's 1981 Farming Systems Research Symposium. Small Farms in a Changing World: Prospect for the eighties. Edited by Wendy Sheppard (pp. 29-39), Manhattan, Kansas, Kansas State University, office of International Programs.

Whyte, Wm. F.

1981 Participatory Approaches to Agricultural Research and Development: A State-of-the-Art Paper. Ithaca: Cornell University, Rural Development Committee, Center for International Studies.

Farming Systems Research and Extension
Class Assignments

1. The first assignment involves writing a paper. There are two options for the paper. (a) The first option is to write a paper discussing and clarifying an important issue in FSR/E. You identify the issue, explain its importance, discuss alternative perspectives on the issue with appropriate references, and then explain and defend your own position with regard to this issue. (b) The second option is to review and critique an FSR/E project. Select a project that has been written as a research report with sufficient detail that it can be reviewed. Provide a brief overview of the project. Identify and describe its key FSR/E components. Identify and discuss project strengths and weaknesses. Draw out and discuss important lessons from the project.

This paper is due no later than the day on which the final exam for this class would be scheduled. The paper must be typed, double-spaced. Follow the format of any major journal in your discipline. There are no length requirements, though it should basically be of academic journal length.

This assignment will count 50% of your grade. The purpose of the assignment is to reveal your knowledge of FSR/E, communicate that knowledge to the course faculty, and make a contribution to the FSR/E literature.

2. The second assignment is to write a brief (3-5 double-spaced pages) paper on how FSR/E relates to your discipline. Discuss the following:
 - (a) the potential contribution of your discipline to FSR/E;
 - (b) issues or perspectives from your discipline that could be particularly useful to incorporate into FSR/E; and
 - (c) likely substantive areas where linkages between your discipline and FSR/E can be made. Also discuss problems of integrating your discipline and FSR/E.This paper is due in class February 21, and will count 25% of your grade.

3. The remaining 25% of your grade will be based on class participation. This will include participation in workshops, exercises, and structured opportunities for you to share your progress and perspectives on the two assignments outlined above.

**FARMING SYSTEMS RESEARCH/EXTENSION
SHORT COURSE/WORKSHOP**

Workshop Objectives: The University of Minnesota will conduct a four and a half day workshop on Farming Systems Research/Extension (FSR/E) with the support of the Florida Farming Systems Support Project. The purpose of this activity is to familiarize the participants with the FSR/E approach as it is practiced throughout the world. Topics to be included in the schedule: Characterization of Farming Systems, Design and Analysis of On-Farm Research, Farmer Participation in FSR/E, Linkages between Research and Extension, Interdisciplinary Team Building, Institutionalization of FSR/E.

Site: Radisson St. Paul Hotel
11 E. Kellogg Blvd., St. Paul, MN 55101

Date: August 20, 8:00 am - August 24, 12:00 pm 1984

Air Travel: Arrive and depart through the Minneapolis/St. Paul International Airport. Airport Limousine Service is available to the hotel at a charge of \$3.50 per person one way.

Automobile Parking: Parking is available in an attached garage at the hotel at \$5.00 per day for overnight guests.

Accommodations: Individuals will be responsible for their own room and incidental charges. Reservations will be made by the conference coordinators upon receipt of the enclosed registration form. Room rates are \$52.00 single and \$62.00 double.

Workshop Fee: The workshop fee of \$100.00 per person will cover registration, breaks, five buffet lunches (Monday - Friday) and course reading materials.

Please make checks payable to University of Minnesota and send by July 20 with completed registration form to:

Ms. Patty Davidson
Farming Systems Workshop
240 Coffey Hall
1420 Eckles Ave.
St. Paul, MN 55108

Workshop Coordinators: Mimi Gaudreau (Soils)
Michael Patton (Caribbean Extension Project)

For More Information: (612) 376-3392 Patty Davidson
(612) 376-3694 Michael Patton
(612) 376-1061 Mimi Gaudreau

FSR Orientation Workshop

Goal: To familiarize the participants with the Farming Systems approach to Research/Extension (FSR/E)

Objectives: At the end of the workshop, the participants will:

- 1) have a better understanding of FSR/E,
- 2) become aware of the complimentarity of Farming Systems Research and traditional agricultural research,
- 3) recognize the importance of existing institutions when trying to establish Farming Systems activities,
- 4) be aware of the merits and complexities of working as part of an interdisciplinary team,
- 5) have greater awareness of the importance of a farmer's perspective in the research/extension process.

FSR Orientation Workshop
 Tentative Program
 St. Paul Radisson
 11 E. Kellogg Blvd., St. Paul, MN 55101
 August 20 - 24, 1984

Sunday, August 19

8:00 p.m. Informal Get-Acquainted Meeting -- Cash Bar
 Garden Court West

Monday, August 20

8:00 - 8:30 a.m.	Registration -- Indian Suite Conference Room	<u>Course Readings</u> FSSP - Whyte I-1
8:30 - 9:30	Welcoming Remarks, Overview of Workshop and Objectives	FSSP - Hildebrand I-4 Norman and Gilbert Hart
9:30 - 10:00	Participant Pair Interviews	Shaner - Executive Summary
10:00 - 10:15	Break	
10:15 - 11:30	Introductions	
11:30 - 1:00 p.m.	Lunch -- Carousel Buffet	
1:00 - 1:30	Case Study: Mali Farming Systems Project	
1:30 - 3:00	Overview of FSR	
3:00 - 3:15	Break	
3:15 - 4:00	Discussion and Review of Day	
6:30	Dinner at Mimi Gaudreau's Home in St. Paul	

Tuesday, August 21

8:30 - 10:00 a.m.	The Farm as a System - Exercise	<u>Course Readings</u> FSSP - Rhoades
10:00 - 10:15	Break	FSSP - CIMMYT Collinson
10:15 - 11:30	The Farm as a System - Results	Hart and Bernsten Shaner - Chapt. 6 & 7
11:30 - 1:00 p.m.	Buffet at Carousel	
1:00 - 3:00	Characterization of Farming Systems: Development of Interview Guidelines	
3:00 - 3:15	Break	
3:15 - 4:30	Discussion: Development of Guidelines as Team Building Technique	
Evening Free		

Wednesday, August 22

8:30 - 10:00 a.m. Mock Sondeo -- NE Minnesota
10:00 - 10:15 Break
10:15 - 11:30 Organization of Sondeo Results
11:30 - 1:00 p.m. Buffet at Carousel
1:00 - 3:00 Discussion of Sondeo Results and
Implications for Developing Research
Priorities
Evening Free

Course Readings
FSSP-Hildebrand VI-1
FSSP-CIMMYT VI-11
Shaner

Thursday, August 23

8:00 - 10:00 a.m. On-Farm Research - Research Design
10:00 - 10:15 Break
10:15 - 11:30 On-Farm Research - Issues
11:30 - 1:00 p.m. Buffet at Carousel
1:00 - 3:00 Farmers Role in Research
3:00 - 3:15 Break
3:15 - 4:30 Linkages: Extension -- Ag. Exp.
6:30 Dinner Together (at own cost)

Course Readings
FSSP - Waugh
FSSP - ISNAR
FSSP - Norman
Caldwell

Friday, August 24

8:30 - 10:15 a.m. Linkages: Existing Institutional Structures
10:15 - 10:30 Break
10:30 - 11:30 Discussion of Workshop and Evaluation
11:30 - 1:00 p.m. Buffet at Carousel and Departure

FARMING SYSTEMS SUPPORT PROJECT

Memorandum of Agreement

Between

The University of Florida

, and

The University of Minnesota

Pursuant to authority contained in Cooperative Agreement No. DAN-4099- A-00-2083-00 entitled Farming Systems Support Project (FSSP), between the Agency for International Development (AID) and The University of Florida (UF), as "Lead Entity", a Memorandum of Agreement (MOA) between The University of Minnesota as "Support Entity" and the University of Florida is hereby established, with the following provisions.

ARTICLE I - STATEMENT OF WORK

A. The Support Entity shall, in keeping with the intent of Title XII of the Foreign Assistance Act, as amended, assist the Lead Entity in implementation of the FSSP Cooperative Agreement (Attachment A) including:

1. Support to AID missions and third world institutions by providing technical assistance, training and networking to practitioners and managers- administrators of farming systems programs as specified in annual plans of work (Attachment B);
2. Advancement of the state of the arts in Farming Systems Research and Development (FSR&D) which is comprised of Farming Systems Infrastructure and Policy (FSIP) and Farming Systems Research/Extension (FSR/E). Emphasis will be given to (FSR/E) management, organization and methodologies for the generation, evaluation and transfer of technology to farm families.

B. The Support Entity shall join other FSSP support entities in expanding capacity for farming systems assistance through a flexible administrative structure and, as evidence to this commitment and appended to this agreement, has;

1. Identified an FSSP administrative contact.
2. Identified an FSSP program leader.
3. Identified a set of FSSP program associates with demonstrable training and/or experience in farming systems documented for the FSSP, and
4. Specified FSSP program interests and institutional capabilities and a plan for further strengthening those institutional goals associated with farming systems work.

C. The Lead Entity, on behalf of FSSP, based on item B4 hereof, shall facilitate the realization of opportunities to strengthen the Support Entity's institutional capability in Farming Systems through training, field experience counsel on overall program and participation in task force endeavors.

D. The Lead Entity, on behalf of FSSP, shall include the Support Entity in networking among regions, countries and support entities and provide enhanced opportunities to participate in technical assistance.

E. The Support Entity shall report annually to the Lead Entity on activities with the FSSP and relative to developments in section B hereof; and program associates shall participate in other reporting efforts associated with implementation of field training and technical assistance projects with which they are directly involved.

ARTICLE II - TIME OF PERFORMANCE

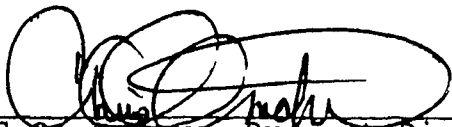
The work described in Article I hereof shall commence on the date of signing of this Memorandum of Agreement and shall continue until September 30, 1987, the termination date of the FSSP Cooperative Agreement; unless both agreements are otherwise amended to extend beyond that date; or unless, at anytime throughout the duration of the MOA, either party gives ninety days prior notice of termination.

ARTICLE III - COMPENSATION

This Memorandum of Agreement will serve as a general document under which funding instruments can be directed to the FSSP Cooperative Agreement and The University of Florida for specified tasks either of a short term or long term nature. Such flexibility is recognized as desirable and necessary for implementation of the emerging FSSP effort.

IN WITNESS WHEREOF, the parties hereto have set their hands and seals on the date indicated.

Lead Entity



C.O. Andrew, Project Director

Support Entity



D.E. Welsch, FSSP Program Leader



H.L. Popenoe, Director, Int'l. Prog.



M.J. Purvis, Assist. Dean for
Int'l. Agric. Programs

Sponsored Research, U.F.