Development of Web-Based Fruit and Vegetable Marketing Network:
A Pilot Project

This proposal is submitted in response to the November 27, 2002, “Request for Proposals” by the Michigan Agricultural Experiment Station, C.S. Mott Chair of Sustainable Agriculture, and Department of Crop & Soil Sciences at Michigan State University, North Central Region Sustainable Agriculture Research and Education Program.

Sustainable Agriculture

In 1988, the U.S. Congress approved the establishment of the Sustainable Agriculture Research and Education program (SARE, formally known as Low-Input Sustainable Agriculture or LISA) within USDA. Its mission is to expand knowledge and adoption of sustainable agriculture practices that are economically viable, environmentally sound and socially acceptable.

Although there is no single definition of sustainable agriculture upon which everyone agrees, a general consensus seems to exist for three dimensions of sustainability--environmental, economic and social. Most research on this subject has focused on production factors related to sustainable or organic agricultural practices. However, currently this focus has not matched what producers would agree is their greatest need--a market for what they produce.

Literature suggests that agricultural producers can benefit from the use of Internet to market farm products. This proposal addresses the socio-economic dimension of sustainable agriculture by proposing the development of a web-based data base management system for the marketing of fruits and vegetables. Not only will the database offer local conventional growers an opportunity to sell directly to Michigan retailers but it will also provide a value-added opportunity for organic and sustainable producers, allowing them to differentiate their produce from conventional producers in the listing of products for sale and earn higher returns.

Study Hypothesis

A web-based fruit and vegetable marketing network would facilitate sales transactions between growers and retailers. It would allow local producers to enter into markets previously limited due to competition from established and entrenched distributors. Often these distributors are the sole outlet for local producers and thus dictate the market. Others are bringing in out-of state and foreign products. Both producers and retailers will benefit from an enlarged distribution system. Retailers’ choices will become greatly enhanced as the competitive "playing field" with out-of state distributors is leveled as fresh local, organic, and/or sustainably produced produce become readily accessible. This alternative or value-added marketing opportunity (fruits and vegetables, in this case) will cause growers to consider adopting sustainable and organic farming practices as they realize the potential for ready access to a market willing to pay substantially more for their products.
Problem Statement/Justification

Many Michigan agricultural producers are experiencing difficult economic circumstances. While some gains can be made by lowering input costs, these gains are limited by producer ability to significantly affect the margin of profit because of the "dampering" effect of low prices. On the other hand, it is widely accepted that value-added marketing has tremendous potential to increase farm profitability. However, the lack (or perceived lack) of markets for sustainable agriculture products is considered to be a major "roadblock" to increased production of such products offered for sale.

The Michigan Agricultural Experiment Station (MAES) has played a key role in support of sustainable agriculture. MAES researchers and educators, across the State, work in collaboration with local organizations like Michigan Integrated Foods and Farming Systems (MIFFS), Michigan Organic Food and Farm Alliance (MOFFA), Organic Growers of Michigan (OGM), and Michigan Agriculture Stewardship Association (MASA) to promote sustainable agriculture practices in Michigan. In this proposal, the researcher proposes to work with MIFFS (a non-profit organization dedicated to promoting diverse community efforts to sustain food and agricultural systems that improve economic, ecological and social well being) in developing a web-based fruits and vegetable marketing network.

The work of this proposal will enhance and be integrated into an on-going initiative designed to promote the marketing of farm produce-- the “Buy Local and Buy Organic” campaign. This campaign is supported by the Michigan Department of Agriculture (MDA), Cooperative Development Services, and Michigan Integrated Food & Farming Systems (MIFFS) and is aimed at opening up new and expanding existing markets by developing educational and advertising programs that promote these products to Michigan consumers and retailers. The campaign’s focus is two-fold: (1) establishing agreements with retailers to buy Michigan produced products in lieu of products produced in other states or countries, and (2) increasing consumer consumption of both locally and organically grown products through an extensive media campaign. As a result, retailers (and ultimately consumers) benefit from a greater selection of fresh or manufactured locally grown and/or organic products and producers benefit from new marketing opportunities offering higher prices and profits.

There has been an overwhelming response from retailers who want to get "on board" and provide organic and/or fresh locally grown products to their customers. As a result, it was quickly recognized that a database was needed that could help producers and buyers (retailers) to more readily locate each other, communicate, and negotiate prices and agreements to purchase product, was needed. MIFFS recognized that such a database could expand the size and scope of the Buy Local and Buy Organic campaign beyond links established between producers and retailers made manually by campaign staff. The new web-based database tool could also lessen the difficulty of tracking and recording a complex set of purchasing agreements between multiple producers supplying product for multiple markets if used by both retailers and producers to record the details of their agreements and transactions.
MIFFS "Marketline", [www.miffsmarketline](http://www.miffsmarketline), a web-based searchable database already exists as a result of a 1999 grant to link small and medium-sized buyers of agricultural products with farmers. "Marketline" hosts a comprehensive directory of Michigan farms with agricultural products to sell and food businesses seeking specific Michigan grown agricultural items. However, "Marketline" is limited to listing products for sale or products desired. It does not provide the needed flexibility or capacity necessary to allow producers and retailers to readily establish purchasing agreements and facilitate and record direct sales transactions between buyers and sellers. As a result of the recent evaluation of "Marketline", MIFFS has a good sense of the limitations of the database and potential to improve it. Therefore, this is an opportune time to undertake an “improvement project” that would improve the capacity of the "Marketline" to meet the increased organizational and marketing demand resulting from the “Buy Local and Buy Organic” campaigns.

**Objectives:** In order to address this challenge, an applied research project focusing on data base development for web-based marketing of fruits and vegetables is proposed in Kent and Ottawa Counties of Michigan. Specifically, the objectives of this applied research project are:

1. Determine the production, processing, packaging, and marketing needs of fruits and vegetable growers in Kent and Ottawa counties.

2. Develop a web-based system of data management for direct marketing and make it available to growers, retailers, and consumers.

3. Instruct producers and retailers about how to successfully use the web-based system of data management for direct marketing of fruits and vegetables.

**Methods and Procedures**

**Research Approaches for Objective # 1.**

**Qualitative Phase:** Identify the important variables influencing the success of value-added marketing. A review of literature will be conducted to examine and evaluate value-added organic and sustainable marketing approaches utilized by existing and past programs and agencies. Based on the findings from the literature review a list of questions pertaining to the development of a web-based value-added marketing system of data management will be developed. This will be the basis for focus group interviews to solicit input from stakeholders.

The focus group, a marketing and research data collection technique, consists of group discussions organized around a particular theme. Its purpose is not to come to consensus, but to gather and explore perceptions, thoughts, opinions and feelings about the issue or program of interest. Local fruit and vegetable growers, retailers, and researchers/Extension educators will be selected (at least two from each group) and invited to participate in an initial focus group. Priority in selection will be given to those most knowledgeable about sustainable agriculture and SARE, and will represent a balance of farmers, researchers, Extensionists, and others. The
purpose of the focus group will be to seek input for the development of a list of variables and questions that will best access and prioritize the needs of value-added marketing opportunities.

**Quantitative Phase:** The findings of the literature review and the focus group interviews will be synthesized to develop mail survey instruments for (a) growers, and (b) retailers. The mail survey for growers will include questions pertaining to the acreage and the quantity of production of various types of fruits and vegetables under conventional, low input, and organic production systems. The survey will assess grower interest in specialty crop production; their interest in transitioning their production practices to explore organic and/or sustainable value-added opportunities; their current educational needs; and how they process and market their products. It will also include questions pertaining to the grades and standards for each product required by retailers and/or distributors. Finally, it will ask whether they are interested in participating in MIFFS’s direct market "Buy Local and Buy Organic" campaign or if they want to be linked to “Marketline”. Similarly, a short questionnaire will be developed for retailers and processors of local fruits and vegetables.

The content validity of the instruments will be established by a panel of experts consisting of Extension educators, sustainable agriculture researchers at Michigan State University, and representatives of MIFFS, MOFFA and OGM. The instruments will be field tested in counties other than the proposed study site to ensure usability and reliability. Based on the feedback, the survey instruments will be modified and updated. A final version of the survey instrument along with the cover letter will be submitted to MSU’s "University Committee for Review of Human Subjects" for approval.

The population for this study will consist of all fruits and vegetable growers in Kent and Ottawa counties. Ottawa and Kent counties are a fruit and vegetable "gold mine", being the highest producing counties in the State and perhaps the most agriculturally diverse. This is also the area where MIFFS is piloting its “Buy Local and Buy Organic” campaign and very near where MIFFS “Marketline” was piloted. Focusing on this area would also allow concentration of effort on training producers and retailers to use the database in the pilot project phase of the campaigns. This would also help ensure success locally before effort is made to extend it to the rest of the state.

Data will be collected by mail survey utilizing the Total Design Method (Dillman and Salant, 1995). All fruit and vegetable producers in Kent and Ottawa counties will receive the survey. In addition, all retailers, processors, and distributors operating in the Grand Rapids area will receive the retail survey.

Survey data will be coded, recorded, and analyzed with the "Statistical Package for Social Science" SPSS PC software. Descriptive statistical techniques such as percentage, mean, standard deviation, cross tabulation, associations and correlations will be used to present (or analyze) survey findings. Inferential statistics such as t-test, one-way and two-way analyses of variance will be used to determine differences between producers, and pre- and post project data for the assessment of project impacts.
Research Approaches for Objective # 2.

The information gathered from the survey will be used to develop a web-based system of data management for direct marketing and make it available to growers, retailers, and consumers. This project will first explore all "leads" on available software that could be utilized with minimal adaptation. If suitable software is found then it will be purchased with funds allocated in the budget. A graduate student or a software development firm will be paid to either adapt the purchased software or to completely develop the web-base system of data management. The web-based system of data management will be developed by proven systems of methodology. These include the following phases:

**Phase 1:** Systems Requirements and Function Analysis: In this phase the scope, business objectives, and requirements of the project will be documented. These tasks will include a description of how the proposed system should work.

**Phase 2:** Development/Customization & Testing: This phase deals with the development and/or customization and unit testing of the software.

**Phase 3:** User & Technical Documentation: This phase will provide users (both functional and technical) with the procedures and instructions to use the system, and will specify the appropriate changes to the existing online and batch programs.

**Phase 4:** User Acceptance Testing: Producers will test all aspects of the web-based database to verify that the system correctly performs pre-defined business functions.

A panel of database users (with a minimum of 5 members) consisting of representatives from MIFFS, MSUE Fruit and Vegetable AOE Team, MIFFS “Marketline” project, and a local retailer and distributor will be formed. This panel will carefully review each phase of the data management system and associated deliverables and provide timely feedback.

Approach for Objective # 3.

The project will organize two workshops in the vicinity of Grand Rapids to educate producers and retailers on how to use the web-based system of data management for direct marketing of fruits and vegetables.

**Expected Impacts**

The focus of this project is on the data base development and use, not so much time and efforts will be made on focus groups and surveys. This pilot project will be evaluated to determine its impact on growers, retailers and consumers. A checklist/questionnaire will be developed to gather information on the nature and extent of benefits derived from this project. It will be administered to gather data from a sampling of growers and retailers during farm and retail visits.
Both qualitative and quantitative data will be gathered to monitor and track immediate and short-term results based on the following impact indicators after two years:

- Number of growers, existing distributors and retailers using the system.
- Amount of volume marketed and value of various (i.e., conventional, low input, or organic) fruits and vegetables products transacted over the electronic marketing system.
- Increase in margin of profit per unit of fruits and vegetables. Potentially economic benefit will occur to both the growers and retailers due to reduced cost of transportation, reduced loss to middlemen or distributors, timely communication, reduced wastage from delivery of fresher product with longer shelf-life to the retailer, and more marketing options for producers leading to the sale of more products at higher prices.
- Reduction in the level of farm stress as a result of using web-based marketing system.

The evaluation will document the immediate and short-term impacts of web-based fruits and vegetable marketing network on growers and retailers. It will also identify variables that need to be addressed through further research and data base development. This evaluative study will serve as the basis for the expansion and/or modification of the program in the future.
Literature Review


Gunter, F.W.; Lesser, W.; and E.W. McLaughlin. 1986. Electronic of fresh fruits and vegetables to New York State institutions: a feasibility analysis. Ithica, N.Y.: Department of Agricultural Economics, Cornell University Agricultural Experiment Station.


Anticipated Time Line

January-March 2003  Receive notification of awards decision. Finalize proposal for submission to USDA. Continue literature search.

April 2003  Conduct literature review. Identify critical questions/variables to be included in the survey instruments and for data base development. Share this with the panel of expert for feedback.

May-June 2003  Finalize sampling frames, mail survey questionnaires to growers and retailers.

July-August 2003  Prepare survey report, share survey findings with MSUE, MIFFS, and local food processing and retaining industries and elicit their input.

August-October 2003  Develop/customize the web-based data management system and test the software.

November-December 2003  Upload selected survey data to the web-based system; demonstrate the system to the advisory panel for approval. Provide training to select growers, retailers, and MSUE staff.

January-December 2004  Monitor the use of web-based system of fruits and vegetable marketing, offer additional workshops to growers and retailers on the use of the web-based marketing system.


March 2005  Project completed, funds expended, and reports submitted
Team Qualifications

Murari Suvedi, associate professor of extension education in the department of ANR Education and Communication Systems, will serve as the lead researcher (estimated time commitment 10%) and Dan Janzen of Michigan Integrated Food and Farming Systems will serve as a collaborator (estimated time commitment 10%).

Dr. Suvedi has worked in the field of agricultural extension for over 25 years. Some examples of his extensive work in program evaluation include: “Monitoring and Evaluation Framework for the North-Central Region SARE Program” in 2000 (Dr. Suvedi, Dr. den Biggelaar and Dr. Smalley) and "An Evaluation of the North-Central Region SARE Producer Grant Program”, Dr. Suvedi and Dr. den Biggelaar.

Dr. Suvedi taught agricultural extension in Nepal for over 10 years before coming to MSU. Currently, Dr. Suvedi is the Program Evaluation specialist for Michigan State University Extension and coordinates the activities of the AEE Center for Evaluative Studies at Michigan State University. In this capacity, he has conducted evaluations of numerous projects and programs in the United States and abroad. Some of the recent studies include: County and Township Perspectives on Land Use in Michigan; farmers perspectives of Michigan State University Extension; evaluation of the Great Lakes Sea Grant Network; zebra mussel outreach activities for industrial and municipal water users; an evaluation of ABC in Science, an agriculturally-based curriculum in Sanilac, Michigan; evaluation of the Groundwater Education Teams providing Groundwater Education in Michigan, (GET-GEM); evaluation of the Water Quality Awareness Program of the Cooperative Extension System; W.K. Kellogg Foundation; International Study Grants Program; an assessment of the utilization of Michigan Extension pesticide educational materials and programs; and the provision of leadership for the evaluation component of the Michigan Groundwater Stewardship Program as well as the implementation of baseline and formative evaluation studies for this program.

Mr. Dan Janzen who will serve as a collaborator representing MIFFS-- is an agronomist and horticulturist with 4 years of experience as a county Agriculture and Natural Resources agent and 21 years experience in production management in the field of agriculture. These management experiences include direct marketing and production of over 20 types of fruits and vegetables. He has a Masters of Agriculture degree from Oregon State University in Agronomy, Extension Education, and International Agricultural Development and a B.S. in Horticulture.
EDUCATION
M.S. University of the Philippines at Los Banos (1982) Extension Education.
B.S. Tribhuvan University, Nepal. (1976) Agricultural Education.

EMPLOYMENT HISTORY/WORK EXPERIENCE
1994-present: Assoc. Professor, ANRECS, Michigan State University
1990-92: Extension Specialist, Michigan State University
1987 - 90: Graduate Teaching Assistant, Michigan State University
1983-87: Lecturer in Agricultural Extension, Tribhuvan University, Nepal
1976-83: Assistant Lecturer, Tribhuvan University, Nepal

PUBLICATIONS


Collaborative/Subcontract Agreements

This applied research and education project is being proposed as a collaborative project with Michigan Integrated Ford and Farming Systems (MIFFS). Except for the direct financial support, MIFFS will share its “Marketline” website and its “Buy Local and Buy Organic” campaign materials and other logistical support as appropriate to complement/supplement this project. A letter of support from MIFFS is attached.

Tom Cary, Sustainable Agriculture & Lake Programs Coordinator of West Michigan Environmental Action Council has indicated that the Greater Grand Rapids Food Systems Council (GGRFSC) would be willing to take on the role of acting as the agent for bringing this web-based marketing tool to the community, retailers, restaurants, institutions and food processors.

A computer science graduate student and/or a programmer/software development technician will be hired to develop/adapt a web-based data management system. The person will be responsible for architecting, designing, developing and system testing the software. An experienced person will be identified and hired to develop and design the web based marketing network.

Budget Narrative

Personnel Wages: One half-time research associate (or post-doc or graduate research assistant) is requested for 9 months to provide support to all aspects of the project. The project will also use hourly student labor for survey data entry and data base management.

Materials and Supplies: Materials and supplies categories will include costs for: (b) buying one computer for data base management; (b) academic license for SQL server; (c) web server and other software for survey data analysis; (d) Internet connector license; (e) survey sampling and mailing expenses; and (f) office supplies.

Travel: Domestic travel to meet with growers and/or their representatives, producer organizations, retailers, and agribusinesses in Grand Rapids area. This also would include PI’s out-of-state travel for project related meetings and attend regional/national conferences.

Publications Costs: This funding is sought to cover expenses of printing survey questionnaires during the first year. During the second year, we request budget for reviews/submission costs and mailings of manuscripts to journals and professional conferences.

All Other Direct Costs: As stated in the project description, the project will seek to buy software or make contractual arrangement to develop and/or customize software for web-based system of data management. This funding is sought to buy the software and contract computer programmer/technician to work with the adaptation/customization of the software to the needs of this project.
Assurance Statement

This applied research project will involve human subjects as farmers and retail business representatives will participate in mail survey. Once the notification of award is received, the PI will submit to MSU’s University Committee for Research on Human Subjects (UCRHS) office a request for approval of the survey protocol. No data will be gathered without prior approval from UCRHS.
Proposal Title: Development of web-based fruit and vegetable marketing network: A pilot project

Team Leader (Must be an MSU employee)
Name: Murari Suvedi
Email: suvedi@msu.edu
Mailing Address: 409 Agriculture Hall, East Lansing, MI 48824

Team Members (name and department):
Dan Janzen, Michigan Integrated Food and Farming Systems (MIFFS)

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*Include existing matching support and pending proposals. Budget narrative should specify sources.

Signatures

Team Leader

_________________________________________________________  ______________________
Date

_________________________________________________________  ______________________
Lead Unit Administrator  Date