Cooler Development for Organic Meats and Produce

Final Report for FNC94-085

Project Type: Farmer/Rancher
Funds awarded in 1994: $5,000.00
Projected End Date: 12/31/1996
Matching Non-Federal Funds: $5,650.00
Region: North Central
State: Kansas
Project Coordinator:

Dan Nagengast
Kansas Rural Center, Inc

Project Information

Summary:

PROJECT BACKGROUND
The Rolling Prairie Farmers Alliance is a group of eight produce and livestock farmers who have joined together for marketing purposes. All of the growers are experienced, organic market gardeners. We sell produce, chickens, boxed beef, flowers, herbs, honey and eggs through a subscription service in Lawrence, Kansas, with delivery at the local food coop. We also do some combined wholesaling to local restaurants.

Before receiving the grant, produce was either harvested immediately prior to sale, hydro-cooled with well water, or chilled in small refrigerators.

PROJECT DESCRIPTION AND RESULTS
The goal of the project was to develop four small-scale, low cost produce cooling devices for vegetables and flowers. Each device was to have been developed on a participating farm, and was to be adapted to the farmer's production and usage. Four coolers have been completed and the fifth has required a design change because of faulty assumptions by the farmer.

Two of the coolers were designed with the assistance of an industrial design class at the University of Kansas (Dan Nagengast farm, Dave Warriner farm). One cooler was constructed using new materials and parts from two older ruined coolers (Mark Lumpe farm). The fourth cooler is being constructed using some technology from the industrial design class coolers, but modified to use less energy (Paul Johnson farm), and the fifth cooler is mounted on a box trailer chassis and designed to be powered by either a mounted generator or plugged directly into a voltage converter run off a car or truck engine, (Joe and Seth Schnebel).

In addition to the above farmers, we worked with the industrial design class at Kansas University, taught by Mr. Lance Rake. We also worked with Ms. Karen Gast of Extension Horticulture as Kansas State University, and Ms. Sheri Smithey, an Extension Refrigeration specialist at Kansas State University. The cooler at the Paul Johnson farm is being designed with assistance from Joe King, a Lawrence, Kansas

architect. Finally, we had some trouble-shooting assistance from Mr. Kent Rausch, also at Kansas State University.

Two of the coolers functioned throughout the 1995 growing season (Dan Nagengast and Mark Lumpe farms). Both farmers were pleased with the results. The cooler on the Nagengast farm was more expensive to build because of the use of new materials; however, it also maintained optimum temperature better. It utilized modified air conditioners. Both farmers felt the coolers to be economical to use. The herb cooler located in a cellar on the Warriner farm is more experimental in nature. The attempt to lower ambient temperature using a dehumidifier did not succeed, requiring the removal of the humidifier. Basically, the problem was that the humidifier worked against itself because it gave off heat inside the cellar, while working to lower the temperature inside the cellar. The farmer is committed to developing a cooling system using his own resources. His plans, partially completed, include vermin proofing the cellar with plaster, increasing the insulation above ground, and installing a small cooling device outside the chamber. The cooler on the Johnson farm was built and tested in the spring of 1996. The cooling unit is also an air conditioner, though outfitted with a humidistat rather than the timer/heating bars used on the Nagengast cooler. Mr. Johnson is trying this slight change in technology because utility prices are substantially higher for his farm, and it is hoped the elimination of the heating bars combined with super insulation will reduce electricity consumption.

We learned about cooling technologies, insulation characteristics and produce and flower cooling needs. Our farms are able to offer better quality produce which increases its desirability and our profits. These coolers were built at 1/3 to 1/5 the cost of conventional cooler with the same capacity, which also improves the bottom line.

While floor plans and construction specifics for the coolers may be of interest to some, the fact is that the cooling boxes are basically highly insulated rooms. The Nagengast cooler uses six inch fiber glass batts insulation. The Johnson cooler uses blueboard insulation, which though more expensive, negates the risk of insulation factor loss inherent in the use of fiberglass batts in moist situations. The batts lose all R value should they become wet. Both the Nagengast and Lumpe cooler suffer from cold air leakage around the doors, pointing out the inherent problems with doors, especially if using salvaged materials or building from scratch. The real point to be made here is that, once educated about available choices in insulation, etc. and once being made aware of problem areas, like doors, growers can learn to trust their own instincts, and develop low-cost technologies which suit them.

In term of gross economic impact, the coolers have enabled all the growers to expand their production. As a group we sold $28,000 in produce without the coolers, and $53,000 in the first year with two of the coolers operational. During the 1996 season we sold $73,000 worth of produce.

OUTREACH

We held one field day in mid summer 1995 at the Nagengast farm. Approximately 120 people saw the cooler in operation. Several were growers and requested information on the modified air conditioner technology. At least one other cooler has since been built using the air conditioner technology because of the field day. A group of 15 interns from the Land Institute in Salina, Kansas came to look at the cooler. Approximately 10 farmers also stopped by and asked for plans after viewing the cooler in 1995. The organizer of a farmer’s collective in Oaxaca, Mexico visited the farm and expressed interest in the cooler. In November, Dan Nagengast wrote an article on the same technology for Growing for Market, a newsletter which serves approximately 2,500 market gardeners. The article generated multiple requests for

copies, wiring diagrams, etc. Dan Nagengast also spoke at the 1st annual Iowa Community Supported Agriculture Workshop to about 75 growers in January 1996, where he passed our copies of the Growing for Market article. The coolers were also featured as part of a market gardeners training organized by the Kansas Rural Center in April 1996, attended by approximately 75 farmers. A customer appreciation day on the Nagengast farm in June 1996 also featured the cooler. Construction plans and budgets for the coolers have been offered through the pages of Growing for Market, and Rural Papers the newsletter of the Kansas Rural Center.

Cooperators

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Research

Participation Summary

Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture or SARE.

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