


2014

# Innovative equipment solutions to reduce costs and improve productivity for small-scale fruit and vegetable growers

Georgeanne M. Artz  
Iowa State University, gartz@iastate.edu

Linda L. Naeve  
Iowa State University, lnaeve@iastate.edu

Follow this and additional works at: [http://lib.dr.iastate.edu/leopold\\_grantreports](http://lib.dr.iastate.edu/leopold_grantreports)

 Part of the [Agricultural Economics Commons](#), [Business Administration, Management, and Operations Commons](#), [Entrepreneurial and Small Business Operations Commons](#), [Horticulture Commons](#), and the [Marketing Commons](#)

---

## Recommended Citation

Artz, Georgeanne M. and Naeve, Linda L., "Innovative equipment solutions to reduce costs and improve productivity for small-scale fruit and vegetable growers" (2014). *Leopold Center Completed Grant Reports*. 441.  
[http://lib.dr.iastate.edu/leopold\\_grantreports/441](http://lib.dr.iastate.edu/leopold_grantreports/441)

This Article is brought to you for free and open access by the Leopold Center for Sustainable Agriculture at Iowa State University Digital Repository. It has been accepted for inclusion in Leopold Center Completed Grant Reports by an authorized administrator of Iowa State University Digital Repository. For more information, please contact [digirep@iastate.edu](mailto:digirep@iastate.edu).

---

# Innovative equipment solutions to reduce costs and improve productivity for small-scale fruit and vegetable growers

## **Abstract**

An array of equipment is available to help fruit and vegetable growers with specialized production and processing tasks. This study examined ways for these small operators to share equipment and maximize their use of the shared implements.

## **Keywords**

Economics, Value Added Agriculture Extension, Business management distribution and marketing, Fruit and vegetables

## **Disciplines**

Agricultural Economics | Business Administration, Management, and Operations | Entrepreneurial and Small Business Operations | Horticulture | Marketing



## Innovative equipment solutions to reduce costs and improve productivity for small-scale fruit and vegetable growers

**Abstract:** An array of equipment is available to help fruit and vegetable growers with specialized production and processing tasks. This study examined ways for these small operators to share equipment and maximize their use of the shared implements.

### Principal Investigator:

**Georganne Artz**  
Economics

### Co-investigator:

**Linda Naeve**  
Value Added Agriculture  
ISU Extension  
Iowa State University

### Budget:

\$22,498 for year one

Equipment for fruit and vegetable production is specialized for specific tasks to save time and labor costs, but it is expensive for small-scale producers to purchase. How can these fruit and vegetable producers increase production and remain profitable without added payroll expenses and/or capital output for equipment?

Sharing specialized equipment among farmers with similar crops and production operations will reduce the initial cost of the equipment and cut labor costs.

### Background

Greater consumer awareness and interest in local foods has encouraged many small-scale fruit and vegetable growers to scale up to meet the demand. Specialized equipment for fruit and vegetable production saves labor but the initial cost may be prohibitive for small-scale producers. Sharing specialized equipment with other growers makes ownership economically feasible.

However, smaller-scale growers face unique challenges for sharing machinery. Compared to row crop operations, fruit and vegetable growers rely on a greater diversity of equipment, such as small tractors, transplanters, bed shapers, plastic mulch layers, mulch removers, rotovators, potato and root crop diggers, etc. Sharing among growers typically will involve a greater number of producers who are geographically dispersed, making transportation and scheduling more complex. Finally, many specialty growers are new to agriculture and are not experienced equipment operators. They may lack the skills required to safely operate the shared machinery. This project addresses some of those issues through case studies of different groups that share different pieces of specialized machinery. The objectives of this project were to:

1. Develop an innovative pilot project with groups of growers to evaluate and test possible models for sharing specialized equipment.
2. Prepare case studies and best practices for equipment-sharing based on the grower groups and present project information at field days, workshops, and conferences hosted by partner organizations.
3. Write and publish an extension publication on equipment-sharing for fruit and vegetable growers.

### Approach and methods

First, the investigators had to select two to six groups of commercial fruit and vegetable farmers who were planning to increase mechanization on their farms and were willing to share the use and/or ownership of at least one piece of field equipment. In February 2013, emails were sent to several key groups, organizations, and individuals



**MARKETING**



*Shared use of equipment that is used frequently, such as a mechanical weeder (shown above), requires clear and prompt communication among partners.*

asking them share and promote this project opportunity with commercial fruit and vegetable growers, and to solicit applications from growers. The application required applicants to identify a specific piece of equipment to be shared and to name a group of two or more farmers interested in participating. The six groups selected were required to develop an equipment-sharing agreement model and use it through the 2013 growing season. The groups also completed and provided equipment-sharing records to the project coordinators, and offered input and suggestions regarding the operation of their specific equipment-sharing model.

Six groups were selected to participate in the project and each purchased a different piece of equipment to share: Holland Transplanter Mulch Layer, multi-use tool bar and attachments, Joanna 3 Aronia Harvester, ECO 1 Weeder, garlic separator, and plastic mulch remover.

## Results and discussion

Five groups completed the project. The group that intended to purchase the mulch remover dissolved before they purchased the equipment, primarily because the key organizer for the group decided to pursue a full-time opportunity off-farm and leave the farming business. In addition, another member in the group worked full-time off-farm, which made it difficult to meet with other farmers. The other five groups successfully shared their equipment throughout the season and plan to continue the sharing the equipment according to the terms in their sharing agreements.

## Conclusions

There clearly is no “one-size-fits-all” strategy for sharing equipment. Some of the things learned in the course of this project were:

*Trust and communication are important.* This is extremely critical when the partnerships are being formed. Transparency about what type of equipment is being purchased to share, who will store it and what the costs will be to operate and maintain the equipment is critical to build trust and a good business relationship. Also, plant and row-spacing needs of the equipment may need to be communicated early in the planning so the machinery and crop spacing are compatible.

*Compatibility matters.* When choosing partners for a sharing arrangement, growers should consider both similarities and complementarities of the farms and people involved. Grouping farms with similar production methods such as organic certification make the use and maintenance of the machinery less complicated.

*Consider the complexity of the equipment and the learning curve.* Farm equipment does not perform the same from field to field, under a variety of soil types and terrain and when pulled by different sizes and types of tractors. Also, varied spacing of tractor tires and hitches can require time-consuming adjustments for some equipment. A lead partner or equipment coordinator may be needed when a shared machine is complicated to operate or requires specific routine maintenance.

*Distance matters.* A common assumption is that close proximity will make sharing equipment easier by reducing transportation costs and allowing the equipment to be used more frequently. However, in certain situations, long-distance sharing can



*Shared use of a plastic mulch layer greatly increases the amount of plastic mulch that can be laid in a season and saves significant amounts of labor.*

make sense. One advantage of long-distance sharing is that scheduling conflicts can be avoided if there is enough variation in the growing seasons of participating farms and the equipment is used only once per season.

*Not everything is worth sharing.* In addition to considering the cost of mileage and time spent in transport, it is important to think about the labor required and the difficulty of the task the machine would perform.

*Equipment sharing can evolve into greater partnerships.* There is much potential for small-scale fruit and vegetable producers to expand their partnerships beyond equipment sharing. A natural extension would be to cooperatively purchase transplants and supplies such as crates, boxes and bags to reduce the unit costs. These partnerships also can evolve into shared marketing of the product. Aggregation and the development of local food hubs for wholesale distribution could be another outcome of equipment-sharing partnerships.

## Impact of results

Small-scale growers are interested in working cooperatively by sharing machinery and labor. This interest is shown in responses to a January 2012 survey of Midwestern fruit and vegetable growers: 70 percent of respondents said they would consider sharing machinery with other growers. Additional post-workshop surveys completed by producers in the winter of 2014 showed that 39 percent had shared machinery, while 85 percent said they are interested in sharing machinery.

Although a few of the farmers participating in this project previously shared equipment informally, this was their first attempt to share equipment on a formal basis with a written agreement. All groups are planning to continue operating under their equipment-sharing agreements in 2014 and beyond. In reference to the ECO 1 weeder, one of the farmers in that group said, “There was a big learning curve the first year of using the ECO 1 weeder and sharing it among three of us. I think the ECO weeder will prove to be a big help. I’ve wanted to get one for several years, but the share program gave me the nudge.”

## Education and outreach

Four presentations were given at field days and conferences.

- Practical Farmers of Iowa Field Day, September 4, 2013, Mt. Pleasant, Iowa, 41 participants.
- National Women in Sustainable Agriculture Conference, November 7, 2013, Des Moines, Iowa, 24 participants
- Iowa Fruit and Vegetable Growers’ Conference, January 23, 2014, Ankeny, Iowa, 26 participants
- Joanna Aronia Harvester Demonstration, September 10, 2013, Council Bluffs, Iowa, 16 participants

“Machinery Sharing Manual for Fruit and Vegetable Growers” (Extension Publication PM 3064) was written, printed, and made available as a free download on the ISU Extension and Outreach Online store. (<https://store.extension.iastate.edu>).

## Leveraged funds

An additional \$8,345 was leveraged from a USDA Rural Cooperative Development Grant for salaries, honoraria and printing costs for publications.

### **For more information, contact:**

Georgeanne Artz,  
Economics, 478B  
Heady Hall, Iowa State  
University, Ames, Iowa  
50011; (515) 294-6260,  
e-mail [gartz@iastate.edu](mailto:gartz@iastate.edu)