

## Extension 21-Value-Added Ag. Program Organic Fruit for Southwest Iowa

Kathleen Delate and Deb Hall, Project Coordinators

Based on producer demand and a Leopold Center for Sustainable Agriculture grant, the first Organic Fruit and Vegetable Conference in Iowa was organized in Cedar Rapids on February 11, 1999, and attracted 100 participants who formalized the organic horticultural industry program in Iowa. An additional grant from the Extension 21 Value-Added Program supported a Focus Group on November 20, 2000, in Greenfield, Iowa, and on January 18, 2001, at The Homestead in Altoona, Iowa, with growers and Extension personnel interested in working with improving production, processing, and marketing of organic grapes, raspberries, apples and blueberries.

An M.S. thesis (Heather Friedrich) in the ISU Department of Horticulture focused on an evaluation of organic pest management tools for a certified organic orchard at The Homestead. Four research and demonstration projects were developed and continue from 2001 from the Focus Groups, including Management of Organic Grapes and Blueberries; Organic Greenhouse Raspberries; and Organic Apple Orchards. Additional programs include nutritional components and food safety of organic produce and products. Project design and implementation is completely farmer-based, with ISU staff assisting in securing plant material, pest management supplies, and labor when time allows. An *Organic Fruit Production* grower and ISU Extension panel was held at the Neely-Kinyon Farm Annual Field Day on August 21, 2001, with much enthusiasm. Much interest in organic fruit production has resulted from this project, with all project farmers continuing the work initiated by this grant. We will continue to meet on a regular basis to provide updates to the general public. Marketing of organic fruit crops from this project will occur through the new *Iowa Harvest* store off I-80 at Greenfield, at Farmers' Markets and through the Prairie Harvest CSA.

### Organic Apples from Iowa



### The Homestead Organic Orchard

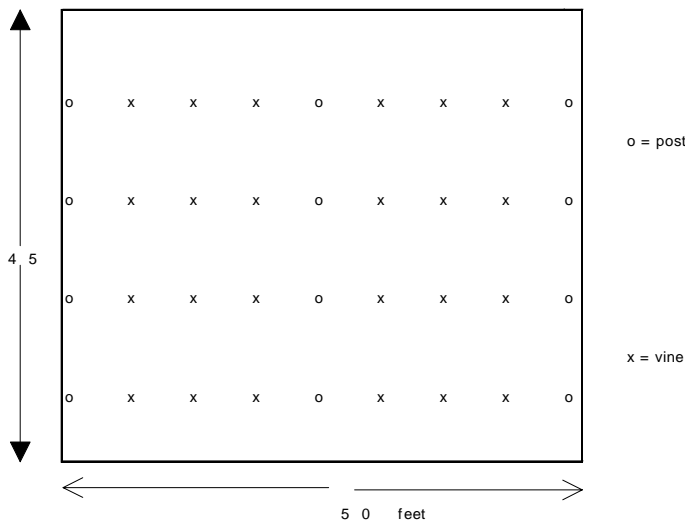


## Organic Grapes at the Neely-Kinyon Farm

Kathleen Delate, Heather Friedrich, Bob Burcham and Deb Hall

The organic grape demonstration was planted at the Iowa State University Neely-Kinyon Farm in May 2001. Vines were left to grow throughout 2001, and pruned on March 20, 2002. These grapes will be grown on a single or double trunk, bi-lateral cordon training system with vines spaced 7 feet apart and rows spaced 9 feet apart. The following varieties were planted in the design specified below:

- 4 Varieties: Foch, Edelweiss, Bluebell, and Frontenac --- 2 each of table and wine
- 6 vines of each variety--All survived except for 1 Frontenac
- 24 total vines
- 4 rows with 6 vines per row
- 4 rows spaced 9' apart and vines within rows 7'
- Total area is 45' x 50' = 2250 sq.ft. or 0.052 acres



In an organic vineyard, only naturally-based insecticides and fungicides are applied. We will be applying organically-approved sulfur at bud break and Surround™ as a fungicide in April 2002. An oat straw mulch will be applied on April 18 and a cover crop of bluegrass will be planted between the rows. Insectary plants (clovers and sweet alyssum) will be planted around vines to attract beneficial insects (provide nectar and pollen).

Grapes will be demonstrated at the N-K Field Day on August 20, 2002. Long-term analysis of economics (next page) of organic grape establishment will be conducted.

**Estimated Vineyard Establishment Cost Based on the Work of Paul Domoto,  
ISU-Horticulture**

9 x 7 ft spacing (691 vines/A) w/ post spaced 25 ft apart

(Labor @ \$8.00)

<b>Pre-Plant (Fall prior to planting):</b>	<b>Labor</b>		<b>Machinery</b>		<b>Materials</b>		<b>Total Cost</b>
	<b>Hours</b>	<b>Cost</b>	<b>Hours</b>	<b>Cost</b>	<b>Units</b>	<b>Cost</b>	
Soil test (Sampling @ 0-6" & 6-12" depth )	.25	2.00			2	14.00	16.00
Plow (+50 hp tractor w/ 3-bottom 16" moldboard plow)	.5	4.00	.5	6.00			10.00
Disk (2x)and drag (+50 hp tractor w/ 17' disk)	.5	4.00	.5	6.00			10.00
Sow cover crop (common Kentucky bluegrass @ \$2.00 / lb) do by hand	.5	4.00			3 lb	6.00	10.00
Amend soil (Materials will be based on soil analysis for pH, P & K) By hand	.25	2.00	.			3.00	5.00
<b>Total pre-plant cost:</b>		<b>16.00</b>		<b>12.00</b>		<b>23.00</b>	<b>51.00</b>
Layout & mark rows	0.5	4.00					4.00
Plant vines w/ a tree planter (2 workers; vines @ \$1.75)	2.0	16.00			24	42.00	58.00
<b>Total planting cost</b>		<b>20.00</b>				<b>42.00</b>	<b>62.00</b>
5" x 8' CCA-Treated post @6.25 bury 2.5 ' space at 25'					12	75.00	
Earth anchors w/ 4" helix & 40" shank @ \$8.87					8	71.00	
12.5 ga HT wire, 2 strands, (4,000 ft roll @ \$60.00/roll) We have this on hand. Need 400'					400'	6.00	
Wire strainer @ \$2.25					8	18.00	
Wire strainer handle On hand.							
Crimping sleeves @ \$.12 On hand.					16	2.00	
Crimping tool On hand.							
2" Staples ( @ \$1.25/lb) On hand					0.75 lb	1.00	
# 9 Wire (to attach end post to anchor, @ \$.053/ft)					60 ft	3.00	
<b>Total Trellis materials cost</b>						<b>176.00</b>	

<b>Year 1 (continued):</b>	<b>Labor</b>		<b>Machinery</b>		<b>Materials</b>		<b>Total Cost</b>
	<b>Hours</b>	<b>Cost</b>	<b>Hours</b>	<b>Cost</b>	<b>Units</b>	<b>Cost</b>	
Mark post locations w/ 10" pot stakes	.25	2.00			12	.50	2.50
Distribute post (2 workers)	.25	2.00	.25	.50			2.50
Auger holes for post and set (2 workers @ 10 min./hole)	3.0	24.00					24.00
Install end post anchors (2 workers @ 5 min)	1	8.00					8.00
String, attach, & tighten wires @ 42"(training) & 5.5' (cordon)	1.0	8.00					8.00
<b>Total installation cost</b>							<b>45.00</b>
Install grow tube (@ .36) w/ 4 ft bamboo stakes (@ .095) & tie to training wire	1.0	8.00			24	11.00	19.00
Flower cluster removal	.5	4.00					4.00
Fertilize by hand (0.08 lb N per vine from compost)	.5	4.00					4.00
Water by hand (2 x)	2.0	16.00					16.00
Weed control, hand hoe and mulch	3.0	24.00					24.00
Mow row middles (5 x)	2.0	16.00	2.0	5.00			21.00
Insect & disease control (6 sprays; 25% canopy organic?)							
Remove grow tube & tie canes to stake w/ .5" plant tie tape (150 ft rolls plus staples)	1.0	8.00			.5 rolls	1.00	9.00
<b>Total cultural cost:</b>							<b>97.00</b>
Land charge .05 acres @ \$120/acre							6.00
<b>Annual operating cash expense</b>							<b>437.00</b>
Operating interest @ 8% for .5 year							17.50
<b>Total Annual Cash Expense Year 1:</b>							<b>454.50</b>

**Organic Apple Orchard Establishment**  
**Henry A. Wallace Country Life Center, Orient, Iowa**  
Diane Weiland and Deb Hall

Because deer populations in southwest Iowa have the potential to decimate young apple trees, one of the first activities of this project was the establishment of a deer fence. Approximately 1,650 ft. of deer fence was erected in the Spring of 2001. It consisted of 8 ft. of high-tensile woven wire and a 10 ft. doublewide gate. The Henry A. Wallace Country Life Center and the Extension 21 Value-Added Grant shared the cost of the fence.

**ORGANIC CERTIFICATION**

The apple orchard will be organically certified. Currently the Community Supported Agriculture (CSA) gardens at the Country Life Center are certified through Northeast Iowa Organics Association serving organic customers of the Organic Crop Improvement Association (OCIA International, Inc.) of Lincoln, NE. It is the Country Life Center's intent to have its acres certified through the Iowa Department of Agriculture and Land Stewardship in 2002. This will also be the certifying agent for the apple orchard.

**ORCHARD DESIGN**

A total of 120 semi-dwarf disease resistant cultivars on M7 rootstock were planted in April, 2001. Trees were planted in six rows with 20 trees in each row and spaced on 14 x 22 ft. centers. Tree cultivars were as follows:

- 40 Liberty – September maturity, red, slightly tarter Macintosh-like flavor
- 20 Redfree – August maturity, early Jonathan type, stores 2 months
- 20 Williams Pride – August, earliest red, stores 6 weeks
- 20 Pristine – July, very early yellow, stores 6 weeks
- 20 Enterprise – October, red late season keeper, stores 6 months

**SUMMARY OF THE GROWING SEASON**

A wet spring dictated the planting of the trees in April. As the trees arrived, they were heeled in to the garden until the weather was suitable for planting. A volunteer brought out a tractor and a posthole digger to make holes for the planting. Organic compost was used as each tree was planted and the trees were mulched with wood chips. It was a very nice growing season with adequate moisture and seasonal temperatures until early July. From mid-July until mid-September, only 2" of rain fell and a volunteer watered the apple trees on July 26, with each tree receiving about 10 gallons of water. The trees were again watered on August 10 and 11. Near the end of September, 9" of rain fell over several days. Each apple tree was weeded in mid-July, and the alleys between the rows were mowed periodically.

## **PUBLIC PROGRAMS ABOUT THE APPLE ORCHARD**

### June 24

Apple orchard tours were included in the Country Life Center's annual "Getting To Know Henry A. Wallace Day." This was also the field day for the Practical Farmers of Iowa, Iowa Network for Community Agriculture and the Prairie Harvest CSA.

### August 21

A program involving all of the Southwest Iowa Organic Fruit Project growers was presented at the annual Neely-Kinyon Research Farm's field day. Diane Weiland presented a session on the Organic Apple Orchard at the Country Life Center.

## **WINTER PREPARATION**

On November 5, the apple trees were wrapped with plastic collars to prevent winter damage from rabbits.

### **Organic Blueberry Demonstration Project**

#### **Clark and Linda BreDahl, Orient, Iowa (9 miles SW Greenfield, Iowa)**

The organic blueberry-planting site is on a farm located in the southwest quarter of section 3, Richland Township, Adair County, Iowa. It is upland prairie soil, Sharpsburg silty clay loam, 0-2 % slope. The site was chosen because of its accessibility, its proximity to a pressurized water system, and its protection from hot summer southwesterly winds. Sharpsburg is a moderately well drained highly productive soil which, without supplemental lime, tends to be slightly to moderately acidic. Soil tests taken at the site in early spring, 2001, indicated a pH of 6.8.

Since plans for the fruit demonstration project were not announced until late fall of 2000, it was impossible to do any tillage or site preparation until spring. Due to extremely dry early spring conditions, Iowa State University commercial horticulturist, Eldon Everhart, recommended disturbing only enough soil to plant the individual bushes. ISU Extension field crops specialist, Clarke McGrath, developed recommendations for adding elemental sulfur to help reduce soil pH to approximately 5.0, a level better suited for blueberry growth and production.

**Planting protocol:** A hand-held gas powered post-hole auger was used to dig individual holes eight inches in diameter, 12 inches deep. Holes were backfilled with a mixture of roughly 50 percent (by volume) loose soil, 50 percent sphagnum peat moss.

Approximately 3 ounces of flaked elemental sulfur was incorporated with the backfill. The top of the blueberry plant root mass was left approximately two inches below the original soil surface. An additional 3-4 inch layer of sphagnum peat moss was mulched in a one-foot radius around the base of each plant. An additional ounce of sulfur was added to the surface mulch.

Seventy-two 2-year old transplants were planted five feet apart within a single row on April 24, 2001. Four varieties were planted in an attempt to provide a longer harvest season. Varieties selected were Elliott, Nelson, Blueray and Patriot. Seed stock came

from Indiana Berry and Plant Co. For research and demonstration purposes, they shared a portion of the seed stock cost with the grower.

**Site maintenance:** Initially, shallow tillage with a rear tine hand tiller was performed in a five-foot wide strip for weed control purposes. This actually seemed to stimulate weed pressure, however, and was stopped after only two attempts. From then on weed control was done with a hand string trimmer and a lawn mower. The string trimmer was used to eliminate all above ground vegetative growth within an approximate 18-inch radius around the base of each plant. A five-foot wide strip was mowed each week along the row of blueberries with the lawn mower set as low as it would cut.

It was decided to provide the berry plants with the equivalent of one inch of water per week all season long. From mid-May until mid-June, frequent rains provided considerably more than that. After mid-June, however, irrigation was needed at least once per week until freeze up. Plastic one-gallon milk jugs held in place with a #9 wire stake were used as water reservoirs. In late July, an additional layer of wood chips mixed with swine manure was added in a two-foot radius around the base of each plant. The wood chips were obtained free for the hauling from the 4-H swine show at the Adair County Fair.

**First-year observations:** New leaf shoots appeared throughout the season, though actual plant height changed little. New leaves were abundant, but seemed to remain lush for only a short period of time. Many of the leaves turned a splotchy yellow or red. Some dried up completely. Few of the plants consistently exhibited the bright shiny dark green appearance that was expected. Despite that, only one bush died during the season, that occurring about six weeks after planting. One other bush was accidentally cut off with the lawn mower, but grew back.

Soil beneath the mulch around the base of the plants was kept moist all season long. They did not suffer moisture stress. Despite that, heat and hot winds appeared to take a toll. Based strictly upon observations of a total novice, my rating of first-year vigor among the varieties, from best to poorest, would be Nelson, Blueray, Patriot and Elliott.

**First-year costs:**

2-yr. transplants	3.99 ea
Shipping, handling	.30 ea
Equipment rental	.33
Fuel, depreciation.	.50
Peat moss	1.30
Sulfur	.05
Labor 2 hr @ 8	<u>16.00</u>
	22.47 per plant

# Organic Greenhouse Raspberry Production Report

Denise O'Brien, Atlantic, Iowa

During the first week in April, 2001, 180 raspberry plants arrived and were planted into one-gallon pots. The varieties included Titan, Encore and Canby. The 60 Tulameen plants were delivered to the Horticulture Department on the ISU campus in Ames. The plants were planted in a mixture of sand, peat and soil.

The plants were set outside and covered with wood chip mulch and to be watered and fertilized. The potted plants were set on a black cloth to prevent weed pressure. The raspberry plants remained at this location for the summer and into the winter months. The plants were fertilized approximately 6 times during the growing period with an organic fertilizer.

On January 13, 2002, the plants were moved into the greenhouse to bring them out of dormancy. The greenhouse is a 20' x 40' structure with a propane furnace. The temperature was set for 45' nighttime and 70 daytime. The plants were arranged in two abreast in rows in the greenhouse.

After consultation with Dr. Marvin Pritts, Cornell University, it was determined that the raspberry plants needed to be transplanted into 2 and 3 gallon pots. This was done on February 8, 2001 with the assistance of Heather Friedrich and Noreen Wantate from Iowa State University. The first blossoms appeared on February 19, 2002, and the bees were ordered. The raspberry plants were fertilized on February 21, 2002.

The mini hive of bumblebees arrived on February 28<sup>th</sup> and released into the greenhouse. There were approximately 25 to 45 bees in the hive. The raspberry plants were again fertilized on March 6, 2002 with 2-2-3 fish emulsion. On April 5, 2002 the first pint of berries was picked. There has been approximately 1 pint picked every other day since the first picking.

I believe this project has been a great success. I attended a workshop in January that was conducted by Dr. Pritts and learned that I had not fertilized the raspberry plants enough during their growing season in 2001. I also did not space the plants properly during their growing season, hence the laterals of the plants did not develop as they should have done. My plants were smaller plants as a consequence and my production has been limited. After harvest I will move the plants out of doors and space them properly for lateral development and I will also fertilize on a weekly basis. I look forward to the 2003 production season as I now have a year of experience and my knowledge has deepened from the 2002 experience.

I truly appreciate the fact that Dr. Delate was able to garner a small grant to make this experience possible. I would not have had the resources to experiment with greenhouse raspberry production had this not happened.