



# ORGANIC FARMING RESEARCH FOUNDATION

*Project report submitted to the Organic Farming Research Foundation:*

**Project Title:**

***Nebraska organically grown grapes***

FINAL PROJECT REPORT

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**Project period:** 2003 - 2004

**Report submitted:** November 2004

## Summary:

*Grape foliar and fruit diseases are, to some extent, present throughout the Midwest every growing season. We know organically certified sulfur will control or suppress most of the disease problems. We also know not all varieties of grapes will tolerate sulfur applications. Some experience severe defoliation and others do not have any problems with sulfur applications. What we do not know is which varieties tolerate and which do not tolerate sulfur applications, or to what degree of damage one can expect on each variety. Nine varieties of grapes were selected on the merits of cold hardiness, disease resistant and quality of grape they produce. These nine cultivars will be divided into three groups. Group one will be sprayed with a full rate of sulfur, group two will receive a half rate application and the third group is the control group for groups one and two to be compared to.*

*These nine varieties were selected and ordered in the fall of 2003. They were planted in April and May of 2004. Watering, trellising, training, weeding and all other normal maintenance practices were administered throughout the summer and fall. Most all the vine preformed wonderful for the first year. There a couple of varieties that were damaged by a hailstorm or struggled with other issues Mother Nature dealt. Over all the vines are going into the winter looking great and should be ready for the sulfur trials next spring as originally proposed.*

Grape production in the Midwest is increasing at a rapid rate. Very little if any are being grown organically due to the fact that little is known about organic disease control on grape in the Midwest. Sulfur is a good material to use for control of most of the major diseases but sulfur treatments will injure some cultivars of grapes. Many cold hardy grape cultivars have never been tested for sulfur sensitivity. The object of the project is to determine which varieties of grapes are tolerant to sulfur applications. Originally we planned to test four varieties however we have been fortunate enough to increase that to nine varieties.

With the assistance of Charles Shapiro, Professor of Agronomy and Horticulture from the UNL Haskell Agriculture Lab Research Center in Concord Nebraska the layout for the plantings were finalized. In the spring of 2004 we planted nine varieties of grapes. The vines are planted 8 foot apart in the row with the rows 10 foot apart just as a normal vineyard would be planted. They are a combination of juice, wine, and table grapes. They were maintained throughout summer and fall to insure the best over wintering results possible which will create a strong healthy vine ready for the sulfur application in the spring.

In the spring of 2005 each variety will be divided into three treatment groups. The first group will be the control group; the second will receive half-rate treatments and the third full-rate treatments. The treatments will be noted as “T-1” the control group, “T-2” half-rate applications and “T-3” full-rate applications. Three rows will make one repetition; each row in the repetition will be allocated one of the three treatments. The formation will look like this:

Row 1 (T-1) Control Group

Repetition 1 < Row 2 (T-2) Half Rate Application

Row 3 (T-3) Full Rate Application

Row 4 (T-3) Full Rate Application

Repetition 2 < Row 5 (T-2) Half Rate Application

Row 6 (T-1) Control Group

There are a few varieties where cold-hardiness is an issue so only one row of these varieties were planted. The formation for the varieties look like this:

Row 1 (T-3) Full Rate Application (T-1) Control Group (T-2) Half rate Application

After planting, watering, trellising, pruning, tying, weed control and other maintenance was performed so the vine could establish themselves in order to be ready for the sulfur applications in the spring and summer of 2005. After the sulfur applications have been administered, evaluation of overall health and vigor of the vines as well as the amount of leaf damage the sulfur has caused. Ed Swanson of Cut Hills Vineyard, one of Nebraska's most knowledgeable grape growers will assist us with the evaluations. Once the data has been collected, Charles Shapiro and the Center for Rural Affairs will be called on again. They will help us in documenting and charting the data we collected. After the documentation and charting is done, we will; then analyze the data and determine how sulfur tolerant each variety is, and it's potential for organic production. This will give us and any other future organic producers an actual in the field test and a good idea which varieties will work for organic production and which will not.

A field Day is scheduled for the summer of 2005 so other vineyards can see for themselves how the vines reacted to the sulfur applications. Handouts and other information will be distributed to those in attendance. Press releases and articles will be summated to the Nebraska Wine and Grape Growers and NSAS newsletters. A press release will also be sent to local newspapers inviting the general public.

As fall is wrapping up another growing season we are looking forward to next spring. The plans for the spraying applications have been made, the sulfur has been ordered and the Field Day's agenda is coming together nicely. Now we have to be patience, as old man winter needs to do his thing.

## Financials:

The financial aspects of our sulfur study were also a success. The first year budget consisted mainly of preparation, planting, and growing expenses – which is constant with our grant proposal. The overall expenses were \$13,151 which is up 2.5% over the estimated expenses of \$12,831. The break down shows the OFRF portion is \$5,385 which is the same as the estimated budget. Our portion of the expense rose to \$7,766.

As with any budget the estimated expense verses the actual expense varied from category to category. One of the biggest increases came under tying - pruning, and grow tube installation, or should we say grow tube reinstallation category. In the early morning hours of July 4<sup>th</sup> a thunderstorm pass through bring heavy rain, hail, and winds in excess of 70 mph. Needless to say many hour were spent picking up grow tubes and tying the vines back on the trellis. Another unbudgeted increase came under Irrigation. Through our vineyard planning we realized that our current irrigation system would be incapable of meeting the demands in a below average precipitation year. Therefore we installed 1500 feet of under ground main line, with risers connecting to the drip line to solve the problem. All the work was done in house thereby insuring quality as well as cost control.

Some of the increased expenses were offset by innovative designs developed to help reduce our labor expense. The first design was an attachment to fit the loader bucket on our tractor. The attachment aloud us to push inline trellising posts in the ground rather than dig holes, place, and set posts. This innovation saved us nearly four hours of labor per acre. The second attachment was built to fit the 3point, pto driven, post hole digger. This aloud us to screw anchors in the ground with the post hole digger. The net labor savings was 3.4 labor per acre. Overall we were very pleased with how the financial aspects of the sulfur study turned out.

# 1st year budget

Hours Unit Cost Units/acre Cost/acre 2.2 Acres OFRF Cost Our Cost

## Site Preparation

|  |          |          |  |       |    |      |    |    |      |
|--|----------|----------|--|-------|----|------|----|----|------|
| Travel for v-ripper (120 miles x .30 = \$36) | \$       |          |  | 16.36 | \$ | 36   | \$ | 36 | \$   |
| V- Rip site                                  | 1.8      | 25       |  | 45    |    | 99   |    |    |      |
| Remove rocks, fill holes ect.                | 2.1      | 10       |  | 21    |    | 46.2 |    |    | 46.2 |
| Fence Area                                   | .46/foot | 500 feet |  | 230   |    | 506  |    |    | 506  |

## Vineyard Layout

|                                  |     |    |  |    |  |      |  |      |  |
|----------------------------------|-----|----|--|----|--|------|--|------|--|
| Plot layout                      | 2.5 | 10 |  | 25 |  | 55   |  | 55   |  |
| Marking materials flags or paint |     |    |  | 5  |  | 11   |  | 11   |  |
| Marking labor                    | 3.9 | 10 |  | 39 |  | 85.8 |  | 85.8 |  |

## Planting

|                     |      |      |     |        |  |         |  |         |         |
|---------------------|------|------|-----|--------|--|---------|--|---------|---------|
| Auger holes         | 5.5  | 15   |     | 82.5   |  | 181.5   |  | 181.5   |         |
| Auger rental        |      |      |     | 18.4   |  | 40.48   |  |         | 40.48   |
| Vines               |      | 2.46 | 545 | 1340.7 |  | 2949.54 |  | 1474.77 | 1474.77 |
| Planting & watering | 36.6 | 10   |     | 366    |  | 805.2   |  | 402.6   | 402.6   |

## Trellising materials

|   |  |      |     |        |  |         |  |  |         |
|---|--|------|-----|--------|--|---------|--|--|---------|
| 4" wood post (line posts)                       |  | 3.55 | 187 | 663.85 |  | 1460.47 |  |  | 1460.47 |
| 6"x10' CCA-treated end posts                    |  | 7.25 | 22  | 159.5  |  | 350.9   |  |  | 350.9   |
| 12.5 ga. Hi tensile wire (4000ft/roll)          |  | 62.1 | 2.5 | 155.25 |  | 341.55  |  |  | 341.55  |
| End post anchors (5.8"x4' helical end)          |  | 6.73 | 22  | 148.06 |  | 325.73  |  |  | 325.73  |
| In line ratchets for cordon&trunk support wires |  | 2.12 | 44  | 93.28  |  | 205.21  |  |  | 205.21  |
| Staples (28lbs) & wire crimping sleeves (44)    |  |      |     | 9      |  | 19.8    |  |  | 19.8    |

## Trellising Labor

|                                       |      |    |     |       |  |       |  |       |       |
|---------------------------------------|------|----|-----|-------|--|-------|--|-------|-------|
| Auger in line & end post holes        | 5    | 15 |     | 75    |  | 165   |  | 165   |       |
| Set end post                          | 3.85 | 10 |     | 38.5  |  | 84.7  |  | 84.7  |       |
| Distribute & set line posts           | 5.3  | 10 |     | 53    |  | 116.6 |  | 116.6 |       |
| Tractor for pushing in posts          | 5.3  | 25 |     | 132.5 |  | 291.5 |  |       | 291.5 |
| Mark posts for wire                   | 3.5  | 10 |     | 77    |  | 169.4 |  | 169.4 |       |
| String wire, staple to post & tighten | 12.2 | 10 |     | 122   |  | 268.4 |  | 268.4 |       |
| Install anchors                       | 1.6  | 10 |     | 16    |  | 35.2  |  | 35.2  |       |
| Tractor for anchor installation       | 1.6  | 25 |     | 40    |  | 88    |  |       | 88    |
| Ordering supplies                     | 0.6  | 10 |     | 6     |  | 13.2  |  | 13.2  |       |
| Unloading trucks (tractor & labor)    | 0.7  | 25 |     | 17.5  |  | 38.5  |  |       | 38.5  |
| ATV (unroll wire, ect)                |      |    | 100 | 100   |  | 220   |  |       | 220   |

## Weed Control

|                                |     |    |  |      |  |       |  |       |       |
|--------------------------------|-----|----|--|------|--|-------|--|-------|-------|
| Mow row middles 3 times        | 1.7 | 30 |  | 51   |  | 112.2 |  | 112.2 |       |
| Propane for burner             |     |    |  | 19.4 |  | 42.68 |  |       | 42.68 |
| Labor for burning around vines | 4.7 | 10 |  | 47   |  | 103.4 |  | 103.4 |       |

|  | Hours | Unit Cost | Units/acre | Cost/acre       | 2.2 Acres       | OFRF Cost       | Our Cost        |
|--|-------|-----------|------------|-----------------|-----------------|-----------------|-----------------|
| <b>Canopy management (training)</b>            |       |           |            |                 |                 |                 |                 |
| Grow tubes                                     |       | 0.9       | 545        | 490.5           | 1079.1          | 539.55          | 539.55          |
| Install grow tubes                             | 25.3  | 10        |            | 253             | 556.6           | 347             | 209.6           |
| Tying & pruning                                | 21.2  | 10        |            | 212             | 466.4           | 188.1           | 278.3           |
| Tie materials                                  |       |           |            | 20              | 44              | 44              |                 |
| Mileage to get tying supplies (240miles x .36) |       |           |            | 39.27           | 86.4            | 86.4            |                 |
| Grow tube removal                              | 15.5  | 10        |            | 155             | 341             | 341             |                 |
| <b>Irrigation</b>                              |       |           |            |                 |                 |                 |                 |
| Irrigation & 1/2" drip line                    |       |           |            | 368             | 809.6           |                 | 809.6           |
| Mileage to pickup drip line (245 miles x .36)  |       |           |            | 40.9            | 88.2            | 88.2            |                 |
| Labor to irrigate                              | 14.9  | 10        |            | 149             | 327.8           | 327.8           |                 |
| <b>Marvin Lange</b>                            |       |           |            |                 |                 |                 |                 |
| Mileage (30 miles x .30= \$9. X 1 trip)        |       |           |            | 4.09            | 9               | 9               |                 |
| Organic consultant and labor                   |       |           |            | 34.09           | <u>75</u>       |                 | <u>75</u>       |
| <b>Total cost</b>                              |       |           |            | <b>\$ 5,979</b> | <b>\$13,151</b> | <b>\$ 5,385</b> | <b>\$ 7,766</b> |



The planting begins



Cows grazing the vineyard while the vines were protected by the grow tubes.  
This worked well!





View after the propane burner went down the rows and after the cows were done grazing



The vines are just emerging from the grow tubes





The vines after removing the grow tubes



The attachment we mounted to the loader bucket, which enabled us to push the posts in the ground