

FIELD
TESTED



Overhead Netting on a Sloped Vineyard

Field Tested is a series of reports about farm tools that have been tested by Montana farmers to enhance their specialty crop production. The reports describe these farmers' findings to help others make informed decisions about their specialty crop businesses. Visit FarmLinkMontana.org to read more Field Tested reports. This project is administered by the Community Food & Agriculture Coalition with funding from the Montana Department of Agriculture Specialty Crop Block Grant Program.

Arrogant Bastard Micro-winery LLC and Flathead Lake Vineyard | Polson



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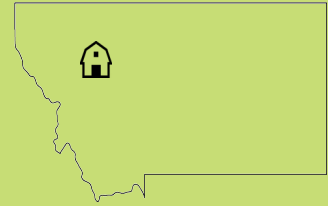
ARROGANT BASTARD VINEYARD SNAPSHOT

Location: Finley Point, Polson

Acres in Production: 0.7

Operator: Larry Robertson

Crops: grape vines including Marquette, Petite Pearl, Crimson Pearl, Verona and one un-released Tom Plocher variety



INTRODUCTION

Producing food in Montana often requires techniques to keep away unwanted wildlife. Larry Robertson has electric bear fence installed around his vineyard, but needed to further protect his crop by installing full overhead netting to keep birds out. Other vineyards with overhead netting in Montana are on level ground, but Larry's vineyard slopes up to 30%. Sloped terrain is beneficial for growing grapes due to good air drainage and avoidance of frost, but it also requires a more intensive system of overhead netting. Larry hopes this guide will help other specialty crop producers consider the use of overhead bird netting, no matter the terrain.



ABOUT THE VINEYARD



Larry started the vineyard in 2015 and the corresponding winery was finished and licensed July 1, 2017. He grows over 480 grape vines and experiments with different varieties to find ones most suitable for Montana's growing climate, particularly around Flathead Lake. Currently, Larry is growing Marquette, Petite Pearl, Crimson Pearl, Verona and one un-released Tom Plocher variety. Most of these varieties may be well-suited to Montana's climate, but Verona needs a little longer growing season and more heat units than the other hybrid grapes. Larry works closely with other

grape growers, wine makers, and the Montana Grape and Winery Association to build the winery industry in Montana.

The vineyard will hopefully produce over half of Arrogant Bastard Winery's anticipated production. The other half of production will be cherry, haskap, plum, pear, peach, nectarine and some tropical fruits which Larry is cultivating at a separate location in Polson utilizing CO₂ from the winery. Larry also plans to use overhead netting on his 100 haskaps and grapes in Polson, which also are on a hill.

NETTING SYSTEMS IN GRAPE PRODUCTION

As with any fruit crop, protection from wildlife is important for a variety of reasons, crop loss being one of them. There are a variety of bird netting systems that are commonly used to protect fruits from bird damage.

Over-the-Row and Side Netting

Over-the-row netting consists of installing netting by draping it directly over the trellising infrastructure of each row. Side netting involves installing it directly next to the fruits on either side of a row, as pictured here. Both of these systems require a lot of labor to install and take down every year.

Once the netting is placed, managing, testing and pruning leaves becomes nearly impossible with tight netting. Leaves can also end up shading other leaves under the net, which can inhibit full ripening of grapes. In addition, some bird damage may still occur with over-the-row netting, as birds can still reach ripening fruits through the netting.



Side netting covers ripening fruits on either side of the row

Overhead Netting

Overhead netting, on the other hand, covers the entire vineyard, including a ceiling and four walls. Since the entire space is enclosed, producers can easily access the vines to prune, sample, train or harvest without going through or moving netting around. Additionally, tendrils or canes of the vines don't get entangled in the nets. The full net coverage provides superior protection from bird damage. This system also requires a large amount of labor and initial investment to first install; however, subsequent set-up and take-down are less labor intensive.



Overhead netting covers the entire vineyard

Installation and Use of Overhead Netting

Given his knowledge of the industry and likelihood of bird damage, Larry wanted superior protection for his crop as well as the ability to freely prune, train and sample his vines as necessary during ripening. For these reasons, he decided to use overhead netting for his Finley Point vineyard.

Installation of overhead netting requires the most amount time and investment up-front. Here is an overview of the steps involved:

1. Design your layout and buy materials. (See Materials Purchased, the PowerPoint referenced in Additional Resources, and Larry's design at the end of this guide)
2. Prep your land to dig and set all the posts that will hold the netting up.
3. Once the posts are set and in place, wire must be strung and clipped in place at the top of the posts, as this is what the netting will ultimately rest on.
4. Spread the netting over the top of the wires, which takes two people approximately eight hours/acre.

Larry estimates this preparation phase took him a couple hundred hours to complete. Once this system is in place, it takes considerably less time to take the netting off, which is recommended to be done at the end of the season so the netting doesn't get weighed down by heavy snow or ice. The infrastructure of the system makes rolling the netting back at the end of the season and spreading it out the following season fairly easy. It takes roughly the same amount of time to take down and put up.

MATERIALS PURCHASED

- 97 large posts
- Smart Net Systems bird netting
- Plastic 12 1/2 gauge wire
- 25' PVC piping 4"
- 10-gauge wire
- 500 C-clips,
- 60 lag bolts
- Equipment rental

Total estimated cost for netting system over 1 acre of land: \$5,000

Considerations for Installation on Sloped Terrain

Larry found that installation of overhead netting was a bit more intensive than on level ground, but upkeep and general functionality have remained similar to that on level ground. There were three main areas that needed extra consideration in the preparation phase:

Different equipment for digging holes

On level ground, a tractor or other implement can typically be used to dig the post holes. Larry found the tractor work was too dangerous on his sloped terrain, so he had to use a skid steer and an auger. Once the hole was dug out, he used cement in the bottom of the hole to help keep the posts secure.

Post orientation

Larry had to tilt the posts at the bottom of the slope in order to help keep the tension and netting up.

Post frequency

Typically, you can set posts 50'-75' apart on level ground, but Larry found that 40' sections in some areas, particularly where the ground was steeper, would hold the netting up more securely without sagging

CONSIDERATIONS AND RECOMMENDATIONS

Although cost and time to set this system up are more expensive than over-the-row netting, Larry estimates that the total reduction in crop loss would pay for the entire netting system in one season if averaging a typical harvest of 10 pounds per vine. Larry recommends commercial growers consider overhead netting and suggests that it could even be good for use on other fruits as well.

In order to increase the life of your netting and further make the investment worthwhile, be sure to tie back the netting post-season and roll it back a couple weeks before brix (% sugar) gets high enough to attract birds. Also, get a netting repair kit so you are prepared if you get a snag!

It's still important to install electric bear fence to avoid bear damage to your crop, which may include taking down posts if bears try to climb onto the netting.

COMPARISON OF BIRD NETTING SYSTEMS

Netting System	Initial Labor and Cost	Continued Upkeep	Crop Protection	Access to Vines and Crop
Side Netting	Medium	Medium	Medium	Low
Over-the-Row Netting	Medium	Medium	Medium	Medium
Overhead Netting	High	Medium	High	High

Favorable | Neutral | Unfavorable

ADDITIONAL RESOURCES

Montana Department of Agriculture Specialty Crop Block Mini-Grants: The purpose of this program is solely to enhance the competitiveness of specialty crops in Montana. Visit their website to find funding opportunities and more information: agr.mt.gov/SpecialtyCropBlockGrants.

Montana Grape and Winery Association: Visit montanagrapeandwine.com for more information about overhead netting, including an instructional PowerPoint, and other grape resources.

Bob Thaden 2015 Presentation: Full Overhead Bird Netting : View this PowerPoint for more in-depth information about setting up overhead netting systems at montanagrapeandwine.com/growing-grapes-in-montana/.

Farm Link Montana: A project of the Community Food and Agriculture Coalition to connect Montana's beginning farmers and ranchers with the tools they need to succeed: farmlinkmontana.org.



See the Resources on the Montana Grape and Wine website for more information about setting up overhead networking systems. This is a diagram of Larry's installation plans that you may find helpful.

