

Wildlife Pests of Grapes

Birds

Birds are the most common wildlife pest in Minnesota vineyards during the pre-harvest and harvest season. Early ripening, black fruited cultivars such as Severnyi, Maréchal Foch, and Leon Millot are particularly vulnerable to bird attack, but they will also feed on white cultivars as well. Later ripening cultivars have also experienced significant damage as well. Grapes do not necessarily have to be fully ripe to be attacked. Starlings have been known to feed on grapes during early maturation when they have reached 10 °Brix (10% soluble solids, SS). Invariably, grapes will be “sampled” by birds before they are fully mature. Birds typically peck at the berries and leaving the skins on the rachis (**Figure 96**). Besides the loss of crop from bird feeding, damages berries are prone to infection by fruit rots, and invasion by multicolored Asian lady beetles, wasps and bees.

Several methods of deterring birds from vineyard feeding are available. If possible, situate your vineyard as far from trees to lessen the population of birds to begin with. An attempt can be made to completely exclude birds from the grapes by netting the vines (**Figure 97**). The initial expense of the netting is quite high, but when amortized over the life of the netting (5-10 years) it becomes much more affordable. Applying and removing the netting are labor-intensive tasks. However, a number of bird netting implements have been designed that dramatically reduce the time and labor required to making bird netting more feasible. If the netting is just draped over the grapevines, birds have a knack for finding ways to get under the netting to feed. Therefore, it may be necessary to pin the ends of the netting together under the vines.

Some alternatives to netting have been recently tried with good success. Some growers have used multiple layers of hay bale net wrap as an alternative to the expensive bird netting (**Figure 98**). It is inexpensive and can be replaced each season, but it is not strong enough to withstand entry by raccoons. Another approach being used in Germany, the bird netting is attached to the end posts and allowed to hang like a curtain, blocking access to the vineyard aisles. This technique disrupts birds attempting to enter the vineyard from the periphery at low altitudes.

The propane cannon can be effective, especially when combined with occasional shotgun blasts (**Figure 99A**). Unfortunately, use of both the cannon and shotguns have been found to alienate nearby neighbors and are only recommended for rural growers. To be most effective, propane cannons should be moved to different locations in and around the vineyard every few days.

An approach, being used in Oregon, Michigan and Minnesota with some success, is to stretch long strips of bi-colored plastic or Mylar ribbon between the end posts and between line posts over the vineyard (**Figure 99B**). Small extender poles must first be attached to the trellis posts to elevate the tape a foot or so above the vines. As the wind blows, the ribbon flashes and vibrates, making a sound resembling that of a flock of pigeons. The noise is quite disruptive to feeding birds. Birdscare Flash Tape® is a Mylar ribbon being imported from Japan. It is metallic red on one side and silver on the other and relies on its intense visual impact to deter birds.

Other visual tactics have been used to scare birds away with mixed success. Common visual devices include predator kites (**Figure 99C**) or figures, and eye balloons (**Figure 99D**). A novel approach that has recently gained attention in New York is the dancing tube man (**Figure 99E**).

Another method to deter birds is the use of electronic distress call generators such as Bird Gard® (**Figure 99F**). The Bird Gard® uses computer chips programmed with specific bird distress cries, predator calls, and harassment sounds. Birds will hear their particular distress call and stay away. It has been quite effective in several Minnesota vineyards. In addition, a tape with the call of the Sharp Shinned Hawk which preys upon other birds has been effective.

For birds, a combination of several deterrents is more effective than relying on just one, even with netting.

Raccoons

Raccoons are common around Minnesota and other upper Midwest vineyards located near woodlands, ponds, and lakes. They are extremely fond of ripe grapes and can do heavy damage to the crop. In a replicated cultivar trial at Iowa State University (ISU), raccoons selectively sought out Frontenac grapes among 15 other cultivars. In addition, raccoon feeding is usually associated with at least some damage to the vines, as the animals will climb up into them to feed on the grapes. Raccoons typically clean the cluster when feeding and there will be no skins remaining as occurs with bird feeding (**Figure 100A**), and the damage will often be closer to the trunk and cordons (**Figure 100B**).

Bird netting may slow down raccoons, but it will not prevent them from feeding on the grapes. The only reliable method for preventing raccoon damage is to exclude them from the vineyard by means of an electrified fence. At least two weeks before harvest, a 12-18” strip should be tilled clean or sprayed with glyphosate around the entire perimeter of the vineyard. A low fence then can be set up using 3 wires placed at 8 inch intervals above the ground (**Figure 101A**). Polytape wire works well because it is more visible. One of the wires should be a ground wire, the other two “hot”. An alternative to the three-wire electrified system is the use of VersaNet® Garden/Wildlife netting (**Figure 101B**). With either system, corners should be rigged with wire standoffs so that a raccoons cannot simply climb the corner post and avoid the wires. The fence line should be policed daily to ensure that no debris has fallen across the wires and that the raccoons have not broken through. Use of a voltage meter makes it easy to detect shorts or battery failure when they occur. In the absence of an electric fence, the next best solution may be to leave a portable radio set to a “talk station” on all night in the vineyard. The sound of human voices has quite a deterrent effect on raccoons.

Deer

Deer are a problem primarily in new vineyard plantings during the first month or two after vines are set out (**Figure 102**), and in established vineyards trained to a mid-wire system (**Figure 103**). The new shoots are quite attractive to deer, but as they grow and toughen, begin to lose their appeal. Several reliable methods are available for protecting new and established vineyards where deer populations are very high. These options include permanent wire fencing, permanent and temporary electrified fencing, repellants, scare devices and dog restraint systems. Permanent, 8 ft woven-wire perimeter fencing is the most effective system, but also the most expensive (**Figure 104**). Temporary electrified fences have proven to be effective in keeping deer out of new plantings. A 4 ft high two-wire fence built with polytape is usually sufficient to redirect deer browsing habits away from the vineyard.

Commercial repellents such as Hinder® or Plantskydd®, and home-made repellants can be effective for short periods, but have to be re-applied as shoots grow and/or the scent fades away. A very inexpensive deer repellent can be made at home quite easily by combining a couple of eggs with water in an electric blender. This mixture is added to a gallon of water and applied to the vines as a spray. Strained through fine mesh prior to use in order to remove any large egg particles that might clog the sprayer. Again this spray must be reapplied regularly to be effective. Also, some Minnesota growers have repelled deer by hanging bars of soap throughout the vineyard. However, this method along with other materials that are associated with human scent as a deterrent, may work for a while and their effectiveness tends to be inversely associated with the density of the human population in the area.

Scare tactics such as propane cannons and dog restraint invisible fences have also been used. Deer population management is another option in rural areas. This includes habitat management, encouraging hunting, and shooting permits under high damages situations. Minnesota has a wildlife damage management materials assistance program (http://www.dnr.state.mn.us/livingwith_wildlife/wildlife_damage.html). For other states or provinces, growers should check with their departments of Natural Resources.

More detailed information on deer control is available in the following publications:

- Deer Barriers – fencing, repellents, dog restrain systems, scare devices. MSU Ext. Bul. E-2672. www.oak.gov.com/msu/Documents/publications/e2672_deer20barriers.pdf
- Controlling Deer Damage in Missouri. Univ. Missouri Ext. MP685. www.extension.missouri.edu/p/MP685

Voles

As mentioned in the section on winter protection, voles (commonly called mice) sometimes find shelter under vegetation used for winter cover, and gnaw at the vines over the winter (**Figure 105A**). Meadow voles (**Figure 105B**) and prairie voles are common to Minnesota and the upper Midwest. Both leave surface trails in the sod under snow cover (**Figure 105C**). If the vine is completely girdled, it will die. The best policy for growers is to control the vole population before any damage occurs. This is done simply by placing poison bait feeding stations around the vineyard. Zinc phosphide treated oats are now available in paraffin coated form, which improves the longevity of the bait. Pieces of plastic pipe, pop cans, or tin cans all suffice for bait stations. Initial baiting of the stations should be done in mid-October to coincide with the increase in vole shelter-seeking activities. A significant reduction in the vole population can be made at this time of year, just prior to winter. Combined with the natural mortality caused by winter, the vole population should be greatly reduced by spring. Re-baiting the stations in spring helps keep the population from building up again. If this is repeated every year, voles should not be a significant problem. Keeping a vegetation-free area around the grapevine trunks also reduces the incidence of vole damage.

Rabbits

Rabbits can also be a problem in vineyards. They will feed on the young shoots of newly planted vines (**Figure 106A**), and on the trunks of established grapevines in the winter (**Figure 106B**). For newly planted vines, commercial repellents such as Hinder[®] or Plantskydd[®] can be sprayed on the shoots, but must be re-applied as the vines grow. Using grow tubes will provide protection from rabbits, but need to be removed in August to allow the shoots to properly mature. Once the grapevine is dormant, the grow tubes can be re-installed for winter protection from rabbits. For older grapevines, hardware cloth trunk guards can be installed to provide protection from rabbits and voles. Often good habitat management and encouraging predators will provide good protection from rabbits.

Pocket Gophers

Pocket gophers can also be a problem in vineyards, particularly on sandier soils which they prefer. They burrow and feed on the grapevine roots. If there are gopher mounds present in the vineyard and grapevines suddenly collapse and die during the growing season, it is probably because a gopher has eaten the roots (**Figure 107**). Vineyards planted with a tree planter can be particularly susceptible to pocket gophers because they will follow the softer soil made by planter. Pocket gophers can be controlled by trapping, the use of poison baits and fumigants. A novel approach for controlling gophers are devices that disperse a mixture of propane and oxygen down the burrow and ignite it. Encouraging predators is also encouraged (White, 2015).



P. Domoto, ISU

Figure 96. Injury on grapes from bird pecking.



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Figure 97. Protecting grapes with bird netting.



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Figure 98. Applying multiple layers of hay bale net wrap to protect grapes from bird damage.

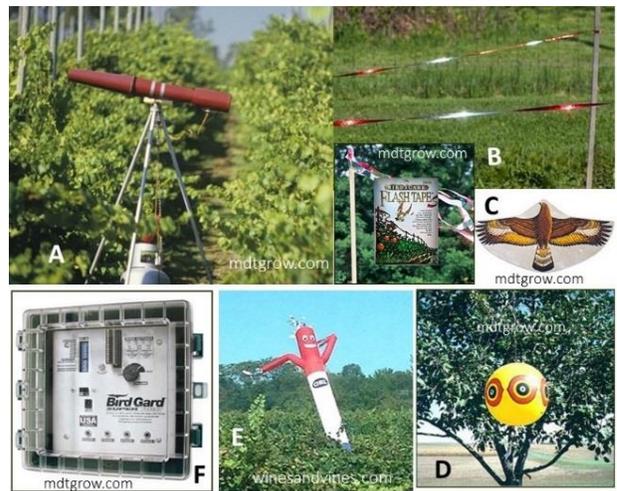
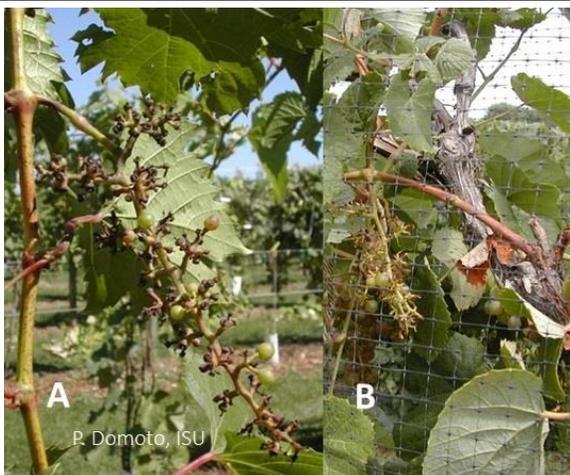


Figure 99. Bird scare tactics: propane cannon (A), Mylar ribbon (B), predator kite (C), eye balloon (D), dancing tube man (E), and distress call generator (F).



P. Domoto, ISU

Figure 100 Raccoon feeding on grapes leaving an almost clean rachis (A), with feeding typically occurring near the trunk and cordon (B).



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Figure 101. Three-strand electrified polytape fence (A), and electrified VersaNet® garden/wildlife netting.



Figure 102. Deer browsing on young grape shoots.



Figure 103. Deer browsing on mid-wire cordon shoots.



Figure 104. Permanent woven-wire deer barrier.



Figure 105. Vole damage on the base of a grapevine trunk (A), a meadow vole (B), and vole tunneling in a vineyard alley way (C).



Figure 106. Rabbit damage on the shoots of a newly planted grapevine (A), and winter damage on the trunk of an established grapevine (B).



Figure 107. Grapevine killed by pocket gopher feeding on the roots.

Vineyard Best Management Practices – Vineyard Pest Management

Rate your vineyard pest management practices:

Management Area: Animal pest control	Best Practices	Minor Adjustments Needed	Concern Exists: Examine Practice	Needs Improvements: Prioritize Changes Here
Identification	Can identify damage caused by all wildlife pests that attack grapes.	Can identify damage caused by most wildlife pests that attack grapes.	Can identify damage caused by some wildlife pests that attack grapes.	Unable to identify damage caused by most wildlife pests that attack grapes.
Habitat	Measures taken to reduce nearby areas that harbor various wildlife pest.		No measures taken to reduce nearby areas that harbor various wildlife pest.	
Birds	In addition to netting, undertake an addition measure to control birds.	Rely on netting to control birds.	Rely on measures other than netting to control birds.	No measures undertake to control birds.
Raccoons	Use electrified fencing to keep raccoons out of the vineyard.	Population low, no measure is taken to keep raccoons out.	Population moderate, no measure is taken to keep raccoons out.	Population is high, no measure is taken to keep raccoons out.
Deer feeding in a new vineyard	Use electrified or permanent fencing to keep deer out of the vineyard.	Use repellants to keep deer out of the vineyard.	Use scare tactics to protect the vineyard.	No measures are taken to protect the vineyard.
Deer feeding in an established vineyard	Use 8-ft permanent fencing or electrified fencing to keep deer out of the vineyard.	Population low, no measures are taken to keep deer out.	Population moderate, no measures are taken to keep deer out.	Populations are high, no measures are taken to keep deer out.
Voles	Use bait stations, keep vegetation away from the trunks and encourage predators.	Population low, keep vegetation away from the trunks and encourage predators.	Population moderate, keep vegetation away from the trunks and encourage predators.	Populations high, no measures are taken to control voles.
Rabbits	Apply repellants on young vines; reduce habitat and encourage predator for established vineyard.	Apply repellants on young vines; population low, no measures taken in established vineyard.	Apply repellants on young vines; population moderate, no measures taken in established vineyard.	No repellants applied on young vines; population high, no measures taken in established vineyard
Pocket gophers	Practice one or more control measure and encourage predators.	Population low, no control measure undertaken.	Population moderate, no control measure undertaken.	Population high, no control measure undertaken.