

Organic Grape Production

By Tara Sood, former UNL student (2008)

Produce

European or Wine Grapes

Vitis vinifera

American (more cold hardy)

Vitis labrusca

Muscadine

Vitis rotundifolia

Cultivars

Good for cold-winter regions:

Interlaken Seedless

Concord

Steuben

Good for the greenhouse or semi-tropical climates:

Muscat of Alexandria – some heat needed

Black Hamburgh – tolerates an unheated house

When choosing a cultivar and type of grape for your vineyard, climate, and area, see ATTRA's publication: *Grapes: Organic Production*. This publication details many aspects to consider when choosing a grape variety and things to consider when maintaining your vineyard in your area.

Growing Recommendations

- **Soil:** Any well-drained soil with organic matter mixed in and a pH of 6.5 to 7.0.
- **Sun/Shade:** Full sun
- **Temperature:** Some grape cultivars will do well in temperate regions with cold winters and these grapes are normally good for jelly, juice, or wine. Dessert grapes for eating fresh are semi-tropical desiring warm to hot weather and only cool winters; these can also be grown in the greenhouse. Provide a site with good air circulation to discourage disease.

- **Water:** Grapes do not need extra water except during drought and may benefit from being water during fruit swell. In the greenhouse, water weekly during the growing season and spray to increase humidity until flowers appear.
- **Planting time:** Plant the young plants in autumn or early spring
- **Planting depth:** Plant to cover the roots firmly and mulch with well-rotted compost or manure
- **Plant spacing:** Plant each plant 5 feet apart
- **Days to Harvest:** After the grapevines are 2 years old they will start producing a yearly crop
- **Thinning:** Bunches of grapes need to be thinned on a regular basis to encourage larger berries. Use nail scissors or special grape scissors to remove misshapen and diseased grapes. After the berries get to pea-sized continuing removing grapes until the rest swell to desired size.
- **Pruning:** Grapes need careful pruning or order to encourage the most fruit because fruit grows from 1-year old wood. Prune in late winter. Train the grapes to a wire support, fence, trellis, or wall. Cut back the main shoot and encourage side shoots. Pinch back the growing tips of the main shoot and side shoots to leave three leaves. Train the branches to the wire supports or wall. In the first fruiting year allow only four bunches of fruit to develop. In subsequent years, one bunch per shoot should be allowed to grow.
- **Harvesting:** When the stems become brown carefully cut the stem and lay the grapes on a tray.
- **Companion Planting:** Hyssop, clover, geranium, oregano, beans, peas, basil, blackberries, chives, plant under Elm or Mulberry trees
- **Incompatible plants:** Cabbage, radish
- **Diversity:** Grapes will benefit from being interplanted with cover crops or short grasses for weed control and mulch. Intercropping with legumes may provide needed nitrogen.
- **Fertilization:** Mulch with well-rotted compost or manure every year. If needed because growth is lacking, two handfuls of blood, bone, and fish meal can be sprinkled per square yard. In the greenhouse, feed with this mixture every other to every week.

Weeds

Weeds can be a significant problem in a grape vineyard as they can take much needed nutrients and water away from the grapes. In the past weeds have been handled by completely clearing the soil beneath the vines. A dusty dry soil beneath the vines works, but is not preferable in maintaining soil moisture or for keeping the soil from eroding. There are many more organic weed control possibilities; cover crops and mulches, well-rotted compost or manure, dwarf grass species, intercropping with grains and legumes, and grazing animals that eat the weeds such as pygmy sheep or geese. The best weed management will incorporate a multiple weed control strategy. The ATTRA publication: *Grapes: Organic Production* has a good discussion on weed control possibilities. Maintain a diverse cropping and stay away from only one method of weed control as this will cause a monoculture of the one weed that is able to grow with that control.

Insects and Diseases

Insects and diseases are significant problems in grape production, particularly in humid areas, such as the eastern and southern United States. Some insects and diseases are particularly problems to the arid climate areas such as California where most of the commercial grape production takes place. Detailed below are general controls that can be applied to the insect pests listed. To see insect pests more applicable to your area see one of these three publications: ATTRA's *Grapes: Organic Production* which has information for the entire US, Ohio State University Extension's publication: *Integrated Management of Grape Diseases* for Midwestern states, and *Organic Grape Production in California* for production in California.

Insects

- **Grape berry moths** – Larvae feed on the flowers, pulp, and seeds and use the leaves to pupate in. Destroy shriveled and infested berries and curled leaves. Collect and destroy or bury fallen leaves at the end of the growing season which may harbor overwintering insects. If scouting reveals a high infestation of these larvae spray BTK to kill the caterpillars.
- **Grape whiteflies** – These can be a serious pest in California. The main method of control should include removing weed species, mainly Buckthorn (*Rhamnus* spp.), that can provide an overwintering spot for this insect pest. Spraying the weeds and/or vines with dormant oil over the winter can also help to control this pest.
- **Grape mealybugs** – Scout for these insects on a regular basis. Natural enemies normally control these insect sufficiently. In heavy infestations, however, natural enemies can be introduced such as

mealybug destroyers (*Cryptolaemus* spp.) also known as Australian lady beetles. Control ants that protect these insects and feed on the honeydew produced by placing boric acid traps near the vines.

- **Grapevine tomato gall** – These will not harm the grapevines, prune off the galls.
- **Grape phylloxeras** – American grapes will tolerate these aphids however these will harm European grapes. Plant hybrids of American and French grapes that will tolerate this aphid.
- **Leafhoppers** – Most of the time these will not be a significant problem in your grapevines as natural enemies will control the numbers. However monitor regularly for them due to their ability to vector insects. Spray with insecticidal soap if needed.
- **Japanese beetles** – For light infestations, knock the beetles off the plant in early morning into a cup of soapy water. For heavier infestations spray with neem and consider applying milky spore disease or parasitic nematodes to control the soil dwelling larvae.
- **Grape cane girdlers** – Most of the time these insects will cause light damage and can be controlled by cutting off the cane a few inches below the puncture sites.
- **Grape cane gallmakers** – Remove and destroy the cane that has been injured a few inches below the red or green gall.
- **Grape scale** – The best control is to prune old growth far back in the winter and to spray with dormant oil late in the winter. These scales look like light gray bumps and hide under old bark.
- **Birds** – Birds especially like the dessert berries, therefore cover the berry clumps with a brown paper bag to discourage attack.

In the greenhouse:

- **Red spider mite** – These mites favor dry, water-stressed plant. Spray the grapevines daily to maintain a humid environment where needed until flowers appear on the plants. Parasitic mites introduced into the greenhouse can also aid in control. If infestation and damage is severe spray with rotenone as a last resort.
- **Vine weevils** – The larvae attack the roots of the plants and can cause the entire plant to fall over. If possible, where grapes are planted in pots, immerse your pots in a solution of rotenone.
- **Scale insects** – Monitor your grape vines regularly and scrape off these insects as soon as they are noticed.

Diseases

- **Powdery mildew** – This fungal disease that weakens the vines spread quickly during dry and warm day and cool nights. It is more common on the west coast of the U.S. In areas that are susceptible to powdery mildew – spray sulfur in the spring and plant resistant cultivars: 'Canadice', 'Cayuga white', 'Ives', and 'Steuben'.
- **Downy mildew** – Remove all diseased plant material in the fall as the fungus can overwinter at these spots. Control of the disease may require multiple copper sprays throughout the growing season, however, hold the spray during flowering. The best solution would be to grow resistant cultivars such as: 'Aurora', 'Baco No.1', 'Canadice', 'Cascade', 'Concord', 'Foch', 'Himrod', and 'Steuben'.
- **Black rot** – This fungal disease should be controlled by removing all old, dry and diseased fruit as it overwinters on infected fruit and stems. Prune all infected stems and sanitize your pruning shears between cuts with isopropyl alcohol or a 10% bleach solution. If this does not effectively control the disease during the following year, spray with a copper spray. This fungal disease is common during hot and humid weather and is seen in areas east of the Rocky Mountains in the U.S. Cultivars exist that have some resistance to this disease: 'Beta', 'Campbell's Early', 'Cascade', 'Chancellor', 'De Chaunac', 'Delaware', 'Elvira', 'Fredonia', 'Hunt', 'Ives', 'James', 'Scuppernong', 'Sheridan', and 'Worden'.
- **Anthracnose** – Grow resistant grapes and cultivars including muscadine grapes and American grape cultivars: 'Concord', 'Delaware', 'Moore Early', and 'Niagara'. Remove diseased plant parts and where this disease has been a problem, spray with lime-sulfur in the spring.
- **Botrytis bunch rot** – Another fungal disease that is found in fruit that is tightly bunched without good air circulation. Thin berries and remove leaves around fruit as well as maintaining a clean planting by removing diseased, old, and weak branches, and fruit by early spring. Resistant cultivars include: 'Baco No.1', 'Cascade', 'Catawba', 'Concord', 'Delaware', 'De Chaunac', 'Fredonia', 'Ives', and Niagara. One interesting thing to note, this disease is used to impart a unique taste to some European wines.
- **Pierce's disease** – This bacterial disease has no cure and is common in the south and spread by leafhoppers. Control leafhoppers by early scouting and management controls. Dig up and destroy infected plants and plant resistant grapes such as Muscadine grapes, and American grape cultivars: 'Champanel', 'Herbemont', and 'Lenoir'.

Goals of the Farmer

Successful organic grape production in the United States is dependent on area of growth. The area east of the Rocky Mountains provides a perfect climate for intense insect and disease pressure on grapes. In these areas, grapes should be specifically chosen for disease and insect resistance or tolerance such as many of the native American grape species. Often the cultivar suitable to your area will not be a popular consumer variety. In these instances consider marketing your grapes for juice, jam, jellies, or wine. On the west coast, west of the Rocky Mountains, much of the nation's commercial vineyards exist. Organically grown grapes in California, Oregon, Washington, and Arizona are more successful because of the dry environment which discourages many diseases and less of an insect pressure. Commercial and homegrown grape production in the west can be and is successful. In the east, homegrown organically grown grapes can be successful with good planning and knowledge of your disease and insect pests and the controls available. Commercial organic grape production in the east will be difficult and will often cost more than traditionally grown grapes.

Grapes in the Whole Farming System

On an organic farm, grapes would fit in as a bush or tree species. They would benefit from intercropping with legumes and beans that provide them nitrogen and other cover crops that provide weed control. Maintaining a compost pile from other garden materials will provide much needed nutrients and mulch to the grape crop. Grazing animals can help with weed control throughout the vineyard and also provide fertilizer and mulch from manure. Growing other crops for market will help to decrease the stress of having one source of income from the farm in case of crop failure. Grapes will do best in an integrated sustainable farming system. Surprisingly, before the current cropping system with chemically controlled weeds, insects, diseases, and fertilizer, grapes were produced organically producing a superior crop and often yielding better. Getting back to this 'old' method will further sustain our grape crops and will cause the final grape to likely rise in taste and value.

References

1. Hamilton, Geoff. (2004) *The Organic Gardening Book*. DK Publishing, Inc. 375 Hudson Street, New York, NY 10014.
2. Ellis BW and Bradley FM. (1996) *The Organic Gardener's Handbook of Natural Insect and Disease Control*. Rodale Press, Inc., Emmaus, Pennsylvania.
3. Anonymous. (No date) **Companion Plants~Insect-Repellant Plants~Beneficial Insects**, Agriculture Articles. Rex Research, PO Box 19250, Jean, NV 89019 USA. 7 December 2008

4. Odum, Sally. (2007) Herbs for Companion Planting. Herb Gardens. Suite 101.com. 7 December 2008
5. Dufour, Rex. (2006) **Grapes: Organic Production**. Appropriate Technology Transfer for Rural Areas. National Sustainable Agriculture Information Service. 7 December 2008
6. Ellis MA and Nita M. (No date) **Integrated Management of Grape Diseases**. Organic Small Fruit Disease Management Guidelines. Department of Plant Pathology at the Ohio State University/OARDC Extension. 7 December 2008
7. Gubler WD. (No date) **Organic Grape Production in California**. Department of Plant Pathology, University of California, Davis. LVWO Weinsberg. 7 December 2008