Ribes is the group of commercial berries that is most adaptable to long-term storage. Certain cultivars of gooseberries and red currants have been held for as long as three months at 0°C and the storage period can be increased with controlled atmosphere storage (CA). At present, the ribes industry is developing again in the US, and demand is growing. In spite of the growth, producers often experience a backlog of fruit during the peak production season in the Northeast, and lower prices due to excess inventory. Controlled atmosphere storage (CA) is a tool that can help to level out supply and prices and make currants and gooseberries available over an extended season.

Successful CA storage of currants and gooseberries is dependent on optimal cultural practices and acceptable weather during the growing season. Healthy berries (defined as full green strips of disease-free red ripe berries) going into CA will have a longer storage life with higher quality than berries that have been stressed or subject to pathogens before storage. This article will first focus on cultural practices and storage techniques as the key parameters that can be controlled by growers. The impact of weather during the growing season is considered, and then recommendations are made for storage practices that match the weather conditions encountered during the year.

Cultural Practices

Training and Pruning - Cordon training is recommended for getting into production quickly, and for growing the best quality fruit. One way to rapid cordon development is to grow the plants for one year as a bush to develop the root system. The cordon branches are selected in the following year, and forced up the stake by taking advantage of the developed roots and providing plenty of water and nutrients. The goal is to keep the plants very vegetative so that roots will be nourished during the growing season in anticipation of pushing the next year’s growth. These plants also have plenty of leaves to nourish developing fruit.

Most pruning is done during the summer. Spent branches that have produced fruit during the fruiting season are removed after harvest as well as any strong, upright branches coming from the base of the plant. Long branches are tipped in the greenhouse and the tip of any fruiting branch growing outside can be cut back to four leaves to encourage new branches near where the fruit was borne in the current year. Winter pruning simply involves thinning out excess branches, leaving only two to three medium-sized branches per cordon. Summer and winter pruning regulate the size of the fruit crop and encourage vigorous vegetative growth to nourish the crop and roots. Light penetration is improved through proper pruning which improves fruit quality and keeps inner parts of the plant from dying out.

Finally, younger healthier plants produce fruit that can be stored longer. For example, in general terms, three-year-old plants might produce fruit of a quality that can be stored until April, while five-year-old plants produce fruit that can be stored until November. The more uniformly healthy a planting is kept, the higher the potential for longer CA storage of fruit from that block. Pruning practices help to keep plants young and uniform. Growers should be aware of the condition of each cordon, and should replace them if they stagnate. Blocks should be replanted as needed depending on their health and vigor.

Soil Quality - Choosing well-drained, friable soil is critical to having optimal root development. Freedom from excess water, and the presence of sufficient oxygen are necessary along with the availability of abundant nutrients, especially NPK.

Water - Preventing water stress on plants is critical for obtaining a quality crop. Remember that water is needed for the ribes industry is developing again in the US, and demand is growing. To extend the marketing season, certain cultivars of gooseberries and red currants can be held for as long as three months at 0°C and the storage period can be increased with controlled atmosphere storage (CA).
Empress – The fruit is large, oval to pointed, and oblong, with dark blue skin. It is free to partially freestone and non-shattering. The neck shrinks in dry seasons and can break down prematurely. In most seasons it is the best fresh market packing plum in Geneva’s trials. The tree is vigorous, somewhat upright and regularly productive if pollinated well. It blooms mid-late and is self-incompatible. It can be pollinated by Stanley, Victory, Moyer, French Prune and Damson. According to the first year’s results in an Empress pollination trial, Damson is the most effective pollinator. Undoubtedly many other blue plum varieties will pollinate it. In Geneva it ripens in late September. The fruit is firm and well-suited for packing and shipping.

Italian Prune – This very well-established variety is also known as Fellenberg. It is an important variety with diverse uses – fresh, canning, and drying. It is both crisp and sweet with good acid balance and a slight bit of astringency. It ripens in the third week of September in Geneva. The fruit is firm and well-suited for packing and shipping.

Valor – This is a medium size, blue skinned variety with amber flesh of good eating quality. It ripens in the third week of September in Geneva. The tree crops regularly, is somewhat thorny, and has moderate vigor with spreading habit. It is self-incompatible and is pollinated effectively by Stanley, Italian Prune and Longjohn. This fruit is firm and well-suited for packing and shipping.

Pozega – This is an old and famous variety from Eastern Europe with high quality and many uses. One of the more common synonyms is Hauszwetsche. In Eastern Europe it has many clones, which have been developed over centuries. Most of the types we have seen in Geneva have small to medium sized fruit with a blue skin and a waxy bloom. The flesh is firm, greenish or amber with high sugar and a good acid balance. Most types have a pleasant level of astringency, similar to Italian. The pit separates easily. It is self-fruitful with an upright tree form. In most seasons the fruit hangs quite well on the tree for several weeks after maturity. This variety is very susceptible to the plum-pox virus. In Eastern Europe it is used for many processing purposes including preserves and brandy. We made a nice preserve from it in 2003.

Autumn Sweet – This variety was recently released by Washington State University. Its fruit quality surpasses that of Italian Prune and it yields much better than Italian. It is partially self-fertile and always sets well in Geneva. In the company of Stanley and NY 9 TM, Autumn Sweet’s fruit is firm and well-suited for packing and shipping. They are medium size and have an attractive dark blue skin color.

President – This is a medium large plum. It is both crisp and sweet with good acid balance and a slight bit of astringency. It ripens in late September and is not as large as Empress. It pollinizes Empress very well and vice versa.

Greengage Plum Types
These are also known as Reine-Claude types and date back to their introduction from Armenia into France at about 1500 A.D. Usually they have small, round, generally green, yellow or blushed fruit with special flavors/aromas that are highly prized by connoisseurs. Usually they have softer flesh texture than most

![Figure 1. Trellised red currant in the greenhouse.](image1)
![Figure 2. Harvested red currants.](image2)
![Figure 3. Packing red currants.](image3)
![Figure 4. Packed red currants.](image4)
![Figure 5. Boxes of red currants in CA storage. Bag is sealed at base of pallet with sensing and gas-feed lines attached.](image5)
![Figure 6. Botrytis causes some loss during storage.](image6)
An stamina that is firm enough to pack and to wholesale markets.

Voyageur – This variety is a second oblong, bluish-purple plum that has a skin that is a rich, purple-blue color. It has good flavor if not too heavily cropped. It needs to pack and to ship to wholesale markets.

California Blue – This is a round, medium-large, unshapely plum that has good flavor and texture, but it is not the size that LS 532. It ripens during the middle of August. It is self-incompatible and pollinized by Vanette and Noble. It is a good pollinizer for California Blue. The tree is more vigorous than Stanley and tends to thin and achieve uniform size. Vanette can pollinize California Blue very well and is firm and well suited for packing and shipping.

Bluebyrd (=By 199158) – The fruit is medium size, with deep purple skin with a waxy bloom. The flesh is an amber color, firm and clingy to the stone. The flesh is juicy and has good flavor and texture. It has good hardness and is more consistently productive than many other blue plums. In some years without fruit thinning, it may break limbs with fruit weight. Bluebyrd is self-incompatible (Scorte and Fogle, 1999).

Early Italian – This well-known variety, blue is also known as ‘Early Fellenberg’ and has outstanding fruit quality. It is not self-fertile and sets lighter crops than Castleton. This variety is also firm enough to pack and to ship to wholesale markets.

Castleton™ – This release from Cornell sets exceptionally heavy crops of medium size, dark blue-purple plums with a blue skin and a very good flavor. It is self-fertile and has good hardiness and has a good sugar/acid balance. The fruit is a good size, and it is firm and has good flavor and texture. It has good hardness and is more consistently productive than many other blue plums. In some years without fruit thinning, it may break limbs with fruit weight. Bluebyrd is self-incompatible (Scorte and Fogle, 1999).

European Blue Plum Types

This group of blue and purple/blue plums formerly known as prunes spans an eight-week ripening period from early August to late September. Many of these cultivars are suitable for storage, some are suitable for processing and some are suitable for fresh markets. This group comprises two distinct climatic reactions. The first is bi-climatic, where the fruit ripens in early August in Geneva, New York and ripens in late August in New York City. The second is the ‘German Prune’ style, where the fruit ripens in late August in Geneva, New York and ripens in late August to early September in New York City.

Fortune – This variety produces the largest fruit of the varieties. It has an excellent flavor and has red/purple skin, yellow flesh and ripens around Labor Day in Geneva. The tree is vigorous. It is self-incompatible and similar to Osli Wahi in hardness. It should not be tried in regions that do not have long enough growing seasons for peach varieties. It is self-incompatible and pollinated well by Burbank.

Gooseberries

The CA storage techniques for gooseberries are not as well tested and developed as for red currants. Some cultivars can be stored at 0°C for at least three months without CA if harvested at a green, mature stage. The berries will ripen off the plant at room temperature, and also over a more extended period in cold storage. They are sensitive to ethylene, and ethylene will speed the ripening process. Two approaches could be taken with gooseberries. One would be to harvest at a green mature stage and place in CA conditions similar to red currants. Ethylene scrubbers could likely extend storage life. A second approach not yet tested might be to harvest at a 3/4 ripe stage and treat with MCP. Dutch researchers are planning to do further research with the second option.

Storing

Short Strips – Last half of strip with no flowers) Short strips are caused by a lack of chill period.

Barries Are Weak and Bursting- Plants probably lacked water in the first growth phase (May-June), and had excess water in the last phase to ripening.

Last Berries Don’t Ripen- If the last berries on the strip don’t ripen, this is usually because the plant did not have enough leaf area. Pruning and water/  fertilization can help improve this situation.

Gooseberries
The CA storage techniques for gooseberries are not as well tested and developed as for red currants. Some cultivars can be stored at 0°C for at least three months without CA if harvested at a green, mature stage. The berries will ripen off the plant at room temperature, and also over a more extended time period in cold storage. They are sensitive to ethylene, and ethylene will speed the ripening process. Two approaches could be taken with gooseberries. One would be to harvest at a green mature stage and place in CA conditions similar to red currants. Ethylene scrubbers could likely extend storage life. A second approach not yet tested might be to harvest at a 3/4 ripe stage and treat with MCP. Dutch researchers are planning to do further research with the second option.

References

A more complete guide to CA storage of Ribes will be available this spring from Cornell Cooperative Extension of Columbia County, 518-628-3346. A growing guide for blueberry production is also now available. Currents, Gooseberries, and Jetsetberries A Guide for Growers, Marketers, and Consumers. In North America by Danny L. Barney, and Kim Hummer.

New York Fruit Quarterly, Volume 14, Number 1, 2006

4 New York State Horticultural Society

45 New York Fruit Quarterly, Volume 14, Number 1, 2006

is firm enough to ship.

Early Italian – This well-known variety, blue is also known as ‘Early Fellenberg’ and has outstanding fruit quality. It is not self-fertile and sets lighter crops than Castleton. This variety is also firm enough to pack and to ship to wholesale markets.

Castleton™ – This release from Cornell sets exceptionally heavy crops of medium size, dark blue-purple plums with a blue skin and a very good flavor. It is self-fertile and has good hardiness and has a good sugar/acid balance. The fruit is a good size, and it is firm and has good flavor and texture. It has good hardness and is more consistently productive than many other blue plums. In some years without fruit thinning, it may break limbs with fruit weight. Bluebyrd is self-incompatible (Scorte and Fogle, 1999).

Early Italian – This variety is a new release that is similar to Castleton. It is firm enough to pack and to ship to wholesale markets.

Castleton™ – This release from Cornell sets exceptionally heavy crops of medium size, dark blue-purple plums with a blue skin and a very good flavor. It is self-fertile and has good hardiness and has a good sugar/acid balance. The fruit is a good size, and it is firm and has good flavor and texture. It has good hardness and is more consistently productive than many other blue plums. In some years without fruit thinning, it may break limbs with fruit weight. Bluebyrd is self-incompatible (Scorte and Fogle, 1999).

European Blue Plum Types

This group of blue and purple/blue plums formerly known as prunes spans an eight-week ripening period from early August to late September. Many of these cultivars are suitable for storage, some are suitable for processing and some are suitable for fresh markets. This group comprises two distinct climatic reactions. The first is bi-climatic, where the fruit ripens in early August in Geneva, New York and ripens in late August in New York City. The second is the ‘German Prune’ style, where the fruit ripens in late August in Geneva, New York and ripens in late August to early September in New York City.