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Lingonberry – A Great New Crop for the Pacific Northwest

Additional index words
Vaccinium vitis-idaea, Ericaceae, lingonberries, cowberry, partridge berry, red whortleberry

Introduction: Lingonberry is one of the less known small fruits in the United States and North America but is widely known in Europe. In the late 1980's, Dr. Elden Stang traveled to Finland and brought back 3,000 seedlings to begin the development and breeding of lingonberries for Wisconsin and the United States. Since 1995 there has been a resurgence of interest in lingonberries as an ornamental crop and as a potential commercial crop in the Pacific Northwest, northeastern United States and Canada.

Classification: Lingonberries are classified into two general categories. The wild lingonberry is *Vaccinium vitis-idaea* L. *var. minus* Lodd and the European varieties being used in commercial production which are *Vaccinium vitis-idea* [Fernald, 1970]. To date, there are seventeen varieties of lingonberries being grown of the European type. Literature noted more varieties are being developed in Newfoundland, Norway, Germany, Sweden and Russia.

Origin: During the Ice Age, the indigenous flora moved south, four Vacciniums became dominant, *V. microcarpum* or the small cranberry, *V. myrtillus* or the bilberry, *V. oxycoccus* or the European cranberry and *V. vitis-idaea* or the lingonberry, which is predominant in the boreal regions [Hiirsalmi, 1989].

Plant Names: The lingonberry is known by many names. It is known as the cowberry, mountain cranberry, rock cranberry, dry-ground cranberry, lingen, lingberry, pomme de terre, partridgeberry, airelle-d'Ida, foxberry, redberry, berris, and graines rouges [Hall and Shay, 1981]. In England, it is called the cowberry [Roper and Stang, undated]. In Finland, it is known a puolukka [Hiirsalmi, 1989]. In Japan, it is Kokemomo [Iwagaki et al., 1977]. In Canada it is known as the partridgeberry, foxberry, redberry, and cranberry [Henderson, 1997].

Plant Range: Worldwide, the genus Vaccinium includes 450 species. After the Ice Age, Vaccinium moved into Europe. The habitat for lingonberry is sandy, bogland with high organic matter and a low pH. In Europe, these types of areas are naturally found in Scandinavia (Denmark, Sweden, Norway, Finland), Eurasia, the Balkans, Germany, Poland, Austria, France, England, Estonia, and Russia.

In North America they are found in Alaska, Michigan, Maine, Minnesota, New Hampshire, North Dakota, Oregon, Washington, Wisconsin, Saskatchewan, Nova Scotia, Newfoundland, and Labrador. Currently Washington and Oregon have over 21 acres in commercial production.

Production Areas: The harvest season in Finland is August to the end of October. In the nordic countries (Norway, Finland and Sweden) the public have common law rights to pick the wild lingonberries in the forest, permits are required in many of the European countries. In the Pacific Northwest, the lingonberry has two distinct harvest seasons. The first season is around the middle of August and the second season is in the middle of October to November.

In reviewing the literature, the supply of wild lingonberries fluctuates greatly. In Finland, the tonnage ranges from 1,700 to 10,220 tons (1,870 to 11,229 US tons) [Hiirsalmi and Lehmushovi, 1993], Sweden ranges from 1,679 to 220,000 tons (1,847 to 220,000 U.S. tons) [Gustavsson, 1997 and Hiirsalmi and Lehmushovi, 1993], and Germany 300 to700 tons (330 to 770 U.S. tons) [Dierking and Dierking, 1993 and Liebster, 1977]. Accordingly, there is a huge demand for lingonberries in the Scandinavian countries of Europe.

Food Uses: Lingonberries are used to make wine, pickles, jelly, syrup, and preserves [Malone, 1995]. The berries are used to flavor concentrates, jams, jellies, purees, sauces, fruit leathers, juices, raisins, preserves, beverage concentrates, ice cream, wine and liqueurs, yogurt, chocolates, pancakes, muffins, rolls, tarts, cookies, and various baked goods [St. Pierre, 1992 and Stang et al., 1994], besides being eaten fresh.

The use of lingonberries in yogurt and ice cream is a recent promotion and is accounting for a large amount of consumption in Finland [Hiirsalmi and Lehmushovi, 1993].

Lingonberries, along with many other Vaccinium's are being looked at for their anthocyanin content. The anthocyanins are responsible for most of the purple, blue and red colors in many horticulture crops. With the demise of artificial colors, there is interest in the water-soluble plant pigments [Anderson, 1985].

Demand: The demand and use of the lingonberry is centuries old. The berry has been used as a basic food and is now used as a health promoting natural fruit. In recent years, the demand for the commercially grown and wild berries has increased among the Scandinavian people. They are importing berries from Russia and Canada [Hiirsalmi, 1989].

Medicinal: Lingonberry, blueberry, and bilberry, which are members of the Vaccinium (Ericacdeae) family, are known for their flavoniod properties (favonols, anthocyanins and proanthocynidans). These properties have anti-cancer characteristics and anti-carcinogenic activity. The full effect is still under investigation [Bomser et al., 1996].

Propagation: Propagation of lingonberries is accomplished with a multitude of methods. The main method is micro-propagation followed by stem cutting. Micro-propagation is used in Michigan and stem cuttings are produced in Oregon as the major source of plant materials. As production and market need for stock has increased, rhizome division and seedlings are being looked at as stock materials. Rhizome divisions can carry pathogens and seedling may not be true to the parent stock.

Lingonberry Production Guide: A new Lingonberry Production Guide will soon be printed and ready for distribution. Contact Ross Penhallegon for more information or for subject references.

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How to Grow Lingonberries

Introduction: The lingonberry is one of the least known small fruits in the United States and North America but it is widely known in Europe and Scandinavia. In the late 1980's, Dr. Elden Stang traveled to Finland and brought back 3,000 seedlings to begin the development and breeding of lingonberries. Since 1995 there has been a resurgence of interest in lingonberries as an ornamental crop and as a berry commercial crop in the Pacific Northwest, northeastern United States and Canada.

Classification: Lingonberries are classified into two general categories. The wild lingonberry is *Vaccinium vitis-idaea* L. *var. minus* Lodd. The European varieties being used in commercial production are *Vaccinium vitis-idea* [Fernald]. In North America they are found in Alaska, Michigan, Maine, Minnesota, New Hampshire, North Dakota, Oregon, Washington, Wisconsin, Saskatchewan, Nova Scotia, Newfoundland, and Labrador.

Varieties: There are 21-varieties of lingonberries being grown of the European type: Ammerland, Ernte dank, Ernte krone, Ernte sagen, European Red, Ida, Koralle, Koralle – German, Linnea, Masovia, Red Pearl, Regal, Sanna, Scarlet, Splendor, Sussi and five numbered varieties – 87102-3, 8723-10, 8724-49, 8726-8 and 8739-8. Worldwide, the genus Vaccinium includes 450 species.

Plant Names: The lingonberry is known by over 25 different names. It is known as the cowberry, mountain cranberry, rock cranberry, dry-ground cranberry, lingen, lingberry, pomme de terre, partridgeberry, airelle-d'Ida, foxberry, redberry, berris, and graines rouges. In England, it is called the cowberry. In Finland, it is known as puolukka. In Japan, it is Kokemomo. In Canada it is known as the partridgeberry, foxberry, redberry, and cranberry.

Planting/Spacing: The habitat for growing lingonberries is sandy, pine forest environments with high organic matter and a low pH. They prefer well-drained soils. Soil along rivers is best. If the soil contains clay, making raised beds will help to keep the soil dry, especially in the wetter maritime climates. The soil should have a pH of between 4.5 and 5.5.

The berries are planted 12-inches apart within the row and the rows are typically 24-inches wide. Within four years, the plants will fill the 24-inch row. The plant spreads by underground rhizomes. The rhizomes are strong enough to fill in the row but they are not an invasive rhizome like quack grass or Canada thistle.

Irrigation: Lingonberries are shallow rooted so they need moderate irrigation the first year for establishment. After the first year, they take even less water.

Fertility: Lingonberries are very sensitive to potassium and chlorides, so use very little fertilizer. The first year a mild fertilizer can be used, as little as 1-2 pounds actual nitrogen per 1,000 square feet of plant row.

Bloom: The wild "Minus" variety blooms in early spring and has one crop. The European lingonberries start blooming in early March and will bloom almost continuously until late August, with two crops, one in early August and the second in early November. To insure good pollination it is recommended to have at least two different varieties.

Insects: Currently there are no insect problems in the Pacific Northwest. Since lingonberries are a Vaccinium species, we expected to find the obscure root weevil, but have not so far. The waxy leaves are repelling many of the Pacific Northwest insects.

Diseases: There are a few diseases that effect lingonberries, namely *Pythium*, *Phomopsi*s, and Phytophthora root rot due to heavy clay soils or over irrigation. A new disease has been identified in lingonberries, Cranberry black rot (*Allantphompsi lunar)*, which has been found in small amounts.

Weeds: Weeds are a major problem for the first two to three years. With the rich soil, weed seeds tend to grow. A lot of hand weeding is necessary. After three years, the beds fill in with plants and weeds are squeezed out. The lingonberry also emits an alleleopathic material that only allows some perennial weeds to grow, no annuals.

Vertebrate pests: Moles can be a problem in lingonberry fields. Moles are attracted to high levels of organic matter, which provide them abundant food sources of earthworms. Birds are also a potential problem, but due to the abundance of other ripe berries, wild blackberries and blueberries, the tart lingonberry has not become a major food source yet.

Food Uses: Lingonberries are used in concentrates, jams, jellies, purees, sauces, syrups, fruit leathers, pickles, juices, raisins, preserves, beverage concentrates, ice cream, wine and liqueurs, yogurt, chocolates, pancakes, muffins, rolls, tarts, cookies, and various baked goods, besides being used fresh.

Medicinal: Lingonberry, blueberry, and bilberry are known for their flavoniod properties (favonols, anthocyanins and proanthocynidans). These properties have anti-cancer characteristics and anti-carcinogenic activity. The full effect is still under investigation.

Propagation: The main method is micro-propagation followed by stem cutting. Micro-propagation is used in Michigan and stem cuttings are produced in Oregon as the major source of plant materials. Rhizome division and seedlings are being considered as stock materials. Rhizome divisions can carry pathogens and seedlings may not be true to the parent stock.

Harvest: In the Pacific Northwest, the lingonberry has two harvest seasons. The first season is around the first of August and the second season is in late October to early November. The six highest yielding berries are: Ernte sagen, Koralle – German, Ernte krone, Ida, Scarlet and Ernte dank. The six varieties yielding the highest brix values are: Linnea, Sanna, Regal, Ammerland, Ernte sagen and Sussi. The six varieties with the highest individual berry weight are: Ernte sagen, 8723-10, Ida, Koralle-German, Koralle and Ernte dank.

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