



Basic Cranberries

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Introduction

There has been an increasing interest in cranberry production in Prince Edward Island and in other suitable areas of North America. Cranberries are a high value crop which has enjoyed an expanding market and good returns to the producers. However, the cost of development is high and there is an period (3 to 4 years) where there is no return on the initial investment. The construction of a commercial cranberry bog requires a professional engineered plan, careful selection of materials, an experienced contractor and the proper equipment. Once the bog is constructed, the grower is required to make and act on informed decisions on variety selection, insect, disease and weed control, water management and fertilizers as well as may other activities required to produce consistent commercial yields. A properly designed, constructed and managed cranberry bog can produce in excess of 15,000 pounds of cranberries per acre.

This factsheet introduces some of the basic concepts involved in commercial production of cranberries on Prince Edward Island.

History

Although wild cranberries have been harvested in the province, commercial cranberry production using constructed cranberry bogs is a relatively new venture in Prince Edward Island. Commercial cranberry production has been active in Massachusetts for over one hundred years. Until 1950 Massachusetts and New Jersey accounted for 90% of the production (22,600 acres). During the 1950's and 1960's production declined. In the 70's and 80's the markets increased with the development of cranberry juices and juice blends. Since then there has been an increase in acreage in other areas. Wisconsin now accounts for 38% of US production. In addition, there have been expansion on the west coast (B.C., Oregon and Washington State), Quebec, Chile, the Atlantic provinces and Maine. From 1992 to 1996 world acreage has expanded by about 1000 acres per year.

In addition to the new acres in production, new crop management techniques and new high yielding varieties have increased the total production. Average production in 1900 was 15 barrels per acre. Average production now is about 150 barrels per acre. The price payed to growers has fluctuated in recent years. Between 1900 and 1974, the average price paid was \$10(US) per barrel. Between 1975 and 1991 prices increased to \$50 (US) per barrel. In 1998, growers in the Atlantic region were received about \$85 (CN) per barrel.

Biology

The cranberry (*Vaccinium macrocarpon*) is native to Eastern North America. The name cranberry has been attributed to a shortened form of crane-berry, so called because the flower resembles the head and neck of a crane. Like the wild blueberry, which cranberries are closely related to, the plant is a perennial. This means that a cranberry vine, once established will continue to produce each year without replanting.

The flowers are borne on upright stems (uprights). The flower buds are formed on upright stems in the fall and over-winter as small buds. The flowers open in spring (June) and are insect pollinated. There are commonly two berries per upright. The berries then ripen through the summer and are harvested in the fall (October).

In its native habitat cranberries grow in open bogs, wet shores, headlands and poorly drained upland meadows. The plant is often found in acidic soils with a pH between 4.8 and 6.1.

For purposes of commercial production a number of cranberry varieties have been developed. These varieties have improved yields, better colour and other characteristics which improve the yield and quality of the fruit. The most common variety planted is Stevens.

Cranberry Talk

Cranberry plants are referred to as vines and fruiting stem as the upright. A cranberry field is called a bog. Unlike a natural bog most cranberry bogs are constructed using sand as the planting medium. The commercial bog consists of a planting bed, dikes, and a holding pond, flooding canal and drainage canals.

Yields are traditionally measured in barrels. One barrel equals one hundred pounds of cranberries. A common management technique is sanding the bog. This entails spreading a thin coat of sand over the bog once every three years. Through-out the year the bogs are occasionally flooded. The depth of the flooding depends on the purpose. A harvest flood may only be a few inches deep. A winter flood, used to protect the plants from extreme low temperatures, will be deeper.

Site Selection

Unlike most other crops, a cranberry bog is constructed. This means that in theory, you could build a cranberry bog almost anywhere if you were willing to spend enough money. However, the key to successful commercial production is to select a site that minimizes the cost of construction, the cost of maintaining the bog and the cost of production.

As a general rule, natural bogs are not suitable sites. In a natural bog it is difficult to control the water level, difficult to construct and may have environmental restrictions.

An ideal site has the following properties;

- a water table about half a metre below the surface,**
- close to an available source of the proper type of sand and other materials used in**

- **construction,**
- **reasonably level so as to reduce the cost of earth moving,**
- **has an available source of fresh water, (usually this is a constructed pond beside the bog),**
- **will not negatively impact on the environment especially natural water courses,**
- **not subject to late spring frosts or early fall frosts,**
- **easily accessible to the grower,**
- **the site is large enough to allow for supporting structures (dikes, ponds) and future expansion.**

Bog Construction

Once a suitable site is selected and all the necessary construction and environmental permits are in place, the construction phase may begin. It is up to the property owner to ensure that proper erosion control is in place to minimize runoff from the site during construction and ensure that the contractor has the proper equipment to do the job. At least, the contractor should possess an excavator, both large and small dozers, and have access to a laser level. The following steps are what normally occurs during construction:

- 1) **If the site is wooded, the trees are cut and the stumps are removed. It is imperative that all debris is totally removed from the site.**
- 2) **The area is surveyed to produce an accurate topographical map with contour intervals of at least 2 feet. This survey should then be sent to a qualified engineer who can develop a set of construction plans.**
- 3) **All vegetation and subsequent topsoil is removed from the site prior to bed and dike construction.**
- 4) **The beds are levelled and all berms/ dikes are constructed. Irrigation main lines are installed at this time.**
- 5) **At this stage, the pond can be excavated, and any material which has to be utilized at a later date (i.e. organic soil) can be removed at this time.**
- 6) **Once the beds are levelled, the organic layer and then the sand can be placed on the beds.**
- 7) **All water control structures should be installed at this time.**
- 8) **Irrigation laterals and sprinklers are installed in the beds.**
- 9) **All berms and exposed land should be seeded out no later than Sept. 15.**
- 10) **Any areas which may experience high water flows should be reinforced with proper erosion control.**

The First Year

After construction is complete cranberry vines are planted. The vines usually come as bales and are spread across the bog and ‘disced’ in using a specialized cranberry planter. The vines are obtained through commercial suppliers and are planted at a density of 1 to 2 tonnes per acre. The cost of the planting material ranges from \$4000 to \$7000 per tonne. There are a number of different varieties grown in North America. The variety selected depends on availability, the intended end use of the product (fresh, juice etc.), the varieties suitability to local climatic conditions and other factors.

After planting the grower ensures that the plants receive the proper fertilizers and the proper amounts of water. The water and often the fertilizers are applied through an irrigation system which is installed prior to planting. Weeding in the first year is often done by hand

Care of the plants is important in the first year. The goal in the first year is to ensure that the plants become established and the bog ‘fills in’ as quickly as possible. There is no fruit produced in the first year. A well rooted, established cranberry plant is more tolerant of changes in moisture, and other adverse conditions and a ‘filled in’ bog will make it difficult for weeds to become established and will maximize yields in future years.

Managing the Crop

Once the plants are established the grower will establish a routine management program that will include weed and pest control, application of fertilizers, irrigation, harvesting , dike, ditch and pond maintenance, and winter flooding.

A typical annual management program includes:

Spring	Summer
<ul style="list-style-type: none"> • Remove winter flood. • Monitor for frost and apply frost protection by irrigation as needed. • Apply herbicides • Apply fertilizers. 	<ul style="list-style-type: none"> • Monitor for insects and diseases and apply control measures. • Irrigate as required. • Apply fertilizers on a regular basis. • Collect leaf and soil samples for analysis. • Control weeds.
Fall	Winter
<ul style="list-style-type: none"> • Flood the bog if wet harvesting. • Harvest the crop. • Conduct fall clean up. • Ditch, dike and pond maintenance. 	<ul style="list-style-type: none"> • Winter flood. • Apply sand every three years.

More Information

For more information on developing a cranberry bog and growing cranberries commercially contact:

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