

Wild Blueberry Production and Marketing in Nova Scotia

A Situation Report - 1998

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Introduction

The lowbush blueberry has developed from humble beginnings into one of the most important horticultural crops in Nova Scotia. The large scale commercial development of today had its beginnings in the late forties and early fifties. Since then, the industry has steadily expanded. Lowbush blueberries are the No.1 fruit crop in the province in terms of total acreage, export sales, and total value to the province's economy.

In 1953, provincial production was 1,125,000 pounds with a farm value of \$152,000. The five-year average production from 1986 to 1990 was 19,313,700 pounds with a farm value of over \$10,000,000. The average annual production from 1991 to 1995 was 29,728,600 pounds. In 1996, 29,229,000 pounds were harvested with a farm gate of over \$20,000,000 and a total value to the economy of Nova Scotia that exceeded \$50,000,000.

The 1997 yields were reduced in large part due to the dry summer but also due to sprout injury during the late June 1996 frost and due to winter injury. In 1997, 22,028,000 pounds were produced with a farm gate value of nearly \$13,500,000 and a total value to the economy of Nova Scotia exceeding \$33,700,000.

Section I - Production

Producers and Acreage

There are over 1,000 producers in the province and over 32,000 acres in production. Most growers operate their fields on a two-year pruning cycle, with about half of their total acreage in crop each year. Acreage per grower varies from as low as one acre to well over a thousand acres for a few large

producers. Thus, annual production per grower can vary anywhere from a low of a few hundred pounds to a high of 2,000,000 pounds or more.

Production Figures

The table below gives annual lowbush blueberry production figures in Nova Scotia for the last fortyone years. The following table gives five-year production figures.

Year	Production (lbs.)	Year	Production (lbs.)
1956	4,020,000	1977	8,202,370
1957	4,800,000	1978	11,618,207
1958	3,000,000	1979	10,723,011
1959	5,200,000	1980	8,348,407
1960	5,400,000	1981	12,866,140
1961	5,700,000	1982	14,113,780
1962	7,400,000	1983	19,502,395
1963	7,000,000	1984	15,107,326
1964	5,100,000	1985	18,950,760
1965	7,000,000	1986	16,212,357
1966	7,600,000	1987	13,525,056
1967	11,500,000	1988	22,005,048
1968	2,100,000	1989	16,831,560
1969	8,882,000	1990	27,994,286
1970	8,200,000	1991	27,940,676
1971	7,100,000	1992	33,007,621
1972	9,897,000	1993	30,307,975
1973	10,075,000	1994	27,182,000
1974	7,557,000	1995	30,204,500
1975	9,928,632	1996	29,229,000
1976	6,842,349	1997	22,028,000

Average Production Figures - Nova Scotia (1961 to 1995)

Period	Average Annual Production
1961 - 1965	6,440,000 lbs.
1966 - 1970	7,656,400 lbs.
1971 - 1975	8,911,526 lbs.
1976 - 1980	9,146,868 lbs.
1981 - 1985	16,108,080 lbs.
1986 - 1990	19,313,661 lbs.
1991 - 1995	29,728,600 lbs.
1996 - 1997	25,628,500 lbs.

The overall steady increase in production over the past thirty years has been due to a strong production base of privately owned land; continuous research and promotion of improved cultural practices by government; aggressive and innovative industry entrepreneurs; ample modern processing facilities; a strong and active producers' association and steadily expanding markets.

Years of unusually high production have been mainly due to a particularly favorable growing season with an abundance of native pollinators and a good supply of moisture at critical times during the growing season. The one year of exceptionally low production (1968) was due to a very late spring frost combined with a prolonged summer drought.

Production Areas

For the purpose of presenting a more accurate picture of lowbush blueberry production in Nova Scotia, the province may be divided into five production areas:

1. Cumberland County
2. Central Nova Scotia - includes counties of Halifax, Colchester and Hants
3. Eastern Nova Scotia - includes counties of Guysborough, Antigonish and Pictou
4. Western Nova Scotia - includes counties of Kings, Yarmouth, Digby, Lunenburg, Queens, Shelburne and Annapolis
5. Island of Cape Breton

Each production area has specific conditions or factors that have a bearing on blueberry production, yields and losses.

About 75 percent of our present production comes from Cumberland County. Although there is still undeveloped acreage which could be brought into production in this county, increased production here will result mainly from improved cultural practices. Yields are generally higher than other areas of the province. This is because development of large acreages took place first in this county, and many fields have been continually improved by a good cultural program over a long period of time. Also, much of this county has nearly ideal soil and climatic conditions for good blueberry production.

The central region has developed steadily during the past several years. This area has good climatic conditions and a good natural acreage base. Production from this region should continue to increase as more fields are developed and existing acreage is gradually improved.

A continued increase in the development and improvement of acreage in eastern Nova Scotia has also occurred during the past several years. Production potential on the large tracts of barren land in the southern and coastal areas of Guysborough County is not great because of climatic factors (i.e. short growing season, severe winterkill) and extremely rough terrain. Only a few of these fields are burned on a regular basis, and usually this is the only cultural practice followed. These fields are rough and rocky and, in most cases, they are owned by the province (Crown lands). With no private ownership and severe production constraints, there is lack of individual initiative to develop fields for higher production.

In the western part of the province (from Hants County westward), blueberry acreage has been developed mainly in Digby, Annapolis, Queens, Lunenburg and Yarmouth counties. There are over 1,000 acres presently in production and many more potential acres which could be developed. This area has the natural advantage of a longer growing season. However, fields have historically been plagued with rocky rough terrain and more weed problems than in other areas of the province. With the introduction of new and improved methods of weed control and land improvement, there is a growing interest in developing new acreage in these counties.

Cape Breton Island has historically never produced satisfactory commercial yields. For years, this was attributed mainly to lack of sufficient heat units during the growing season in coastal areas where commercial development has been attempted. Several inland locations on the island are currently being developed for commercial blueberry production. It now appears that some of these areas have good potential, and that lack of a proper long-term cultural and management program may have been the limiting factor in past commercial development attempts.

Production Methods

Growing a commercial crop of lowbush blueberries has developed into a fairly complex operation. A grower with any significant acreage is involved with various production activities from early spring until late fall. While this booklet is not intended as a production manual, a brief description of the seasonal activities of the blueberry grower is presented here to give a capsule picture of the production methods used with this crop.

Pruning

Pruning lowbush blueberries is done by flail mowing or burning in either the fall or early spring. Pruning gets rid of old growth and promotes the growth of vigorous new shoots which will produce a high yielding crop the following year. Usually, one-half of the total acreage is pruned each year. Burning is usually done with oil or gas burning machines. A few growers spread hay or straw in the fall and burn fields in the spring without the use of a machine. Flail mowing is cheaper than burning and is rapidly increasing in popularity as a pruning method on level ground. The blueberry plant produces only vegetative shoots the first season following pruning. The second year, blossoms and fruit are produced.

Insect and Disease Control

Most 'wild' blueberry growers in Nova Scotia follow the Blueberry Growers' Code of Practice for Pest Management and practice Integrated Pest Management.

At certain times during the sprout (first) and crop (second) years of growth and based on monitoring and surveys, growers may need to apply sprays to control insect or disease pests. These sprays are usually applied with ground equipment such as boom sprayers or micro-mist blowers.

Weed Control

Because of the semi-cultivated condition of blueberry fields, weed control is a continuous problem. The weed control program for most fields involves an overall pre-emergent spray in the spring of the sprout year followed by spot spraying to control escape weeds. Some spot treating of weeds may also be done following harvest during the crop year. Bush type weeds are cut and treated with herbicides while softer weeds are sprayed with back sprayers or tractor-mounted boom sprayers.

Pollination

Lowbush blueberry flowers must be insect pollinated. In order to ensure an adequate pollinating force, many growers place colonies of honeybees or Alfalfa Leaf Cutter Bees in their fields during the bloom period (June). The hives of bees are usually removed once the bloom period is over.

Harvesting

Harvesting on crop fields begins in early to mid-August. Berries are harvested either by hand raking or the use of mechanical harvesters. Harvesting with hand rakes involves organizing picking crews to rake the berries which are then delivered to a collecting station or processing plant. Fields are divided into picking lanes with one raker assigned to each lane. Field supervisors, truckers, field weighers, stringers, etc. must be hired for large operations. If only a small acreage is involved, the grower may perform most of these duties himself. Harvesting usually lasts from one to four or five weeks depending on weather conditions and the acreage to be harvested.

In 1984, the first commercially successful mechanical harvesters were used on about 20 farms. There are now over 300 of these machines in use. A harvester can pick up to six ton of berries per day in high-

yielding fields. However, their use is restricted to fields that are quite smooth and relatively free of weed growth. Harvesting costs with the machine average about 60% of the cost of harvesting with a raking crew. In 1996, it is estimated that approximately 70 percent of the provincial crop was machine harvested. It is anticipated that mechanical harvesters will be used on more acreage each year.

Other

Besides these essential operations, many growers are involved in clearing new land for production and improvement of existing fields through fertilizing, drainage, constructing firebreaks, land levelling, erosion control, etc.

Production and Harvesting Costs

The cost of producing and harvesting a pound of blueberries varies greatly from one grower to another depending on the program he follows, the yield per acre he obtains from his field, and whether his land can be mowed and mechanically harvested. As the yield per acre increases, the unit costs decreases accordingly. Most growers feel their cost for production and harvesting using traditional burning and hand harvesting is somewhere between 35 and 40 cents per pound.

The tables listed below outline costs for a complete production program. Tables I and II give typical costs when the plants are pruned by burning and hand harvested. Comparable costs for pruning by flail mowing and mechanical harvesting are given in Tables III and IV. By using these figures, a grower can obtain estimates of the cost of producing and harvesting a pound of blueberries and make a comparison of costs as they are affected by different yields. These figures are considered by extension workers to be realistic even though costs do vary considerably among different growers.

Production Cost Per Acre		Harvesting and Handling Costs	
Pruning (Burning)	\$ 130.00	Harvesting & Supervision	15¢ to 20¢/lb
Fertilization	30.00	Equipment & Transportation	2¢/lb
Insect Control	20.00		
Disease Control	40.00	TOTAL	17¢ to 22¢/lb
Weed Control	70.00		
Pollination	70.00		
Taxes, Machinery, Equipment & Other Overhead Costs	40.00		
TOTAL	\$ 400.00		

Table II - Variability of Total Production and Harvesting Costs Per Pound Due to Yield Variations (Based on Table I Cost Figures)

Yield	Production Cost	Harvesting and Handling Costs*	Total Cost
1,000 lbs/acre	40.0¢/lb (\$400/acre)	22¢/lb	62.0¢/lb
1,250 lbs/acre	32.0¢/lb (\$400/acre)	21¢/lb	53.0¢/lb
1,500 lbs/acre	26.6¢/lb (\$400/acre)	20¢/lb	46.6¢/lb
1,750 lbs/acre	22.8¢/lb (\$400/acre)	19¢/lb	41.8¢/lb
2,000 lbs/acre	20.0¢/lb (\$400/acre)	18¢/lb	38.0¢/lb
2,250 lbs/acre	17.7¢/lb (\$400/acre)	17¢/lb	34.7¢/lb
2,500 lbs/acre	16.0¢/lb (\$400/acre)	17¢/lb	33.0¢/lb
2,750 lbs/acre	14.5¢/lb (\$400/acre)	17¢/lb	31.5¢/lb
3,000 lbs/acre	13.3¢/lb (\$400/acre)	17¢/lb	30.3¢/lb

* Harvesting and handling costs have been varied from 22¢ to 17¢ to reflect the influence of good yields in lowering harvesting rates.

Table III - Production and Harvesting Costs Using Flail Mowing and Mechanical Harvesting

Production Cost Per Acre		Harvesting and Handling Costs	
Pruning	\$ 35.00	TOTAL	10¢ to 12¢/lb
Fertilization	30.00		
Insect Control	30.00		
Disease Control	60.00		
Weed Control	70.00		
Pollination	70.00		
Taxes, Machinery, Equipment & Other Overhead Costs	40.00		
TOTAL	\$ 335.00		

Table IV - Variability of Total Production and Harvesting Costs Per Pound Due to Yield Variations (Based on Table III Cost Figures)

Yield	Production Cost	Harvesting and Handling Costs*	Total Cost
1,000 lbs/acre	33.5¢/lb (\$335/acre)	12¢/lb	45.5¢/lb
1,250 lbs/acre	26.8¢/lb (\$335/acre)	12¢/lb	38.8¢/lb
1,500 lbs/acre	22.3¢/lb (\$335/acre)	11¢/lb	33.3¢/lb
1,750 lbs/acre	19.1¢/lb (\$335/acre)	11¢/lb	30.1¢/lb
2,000 lbs/acre	16.7¢/lb (\$335/acre)	10¢/lb	26.7¢/lb
2,250 lbs/acre	14.8¢/lb (\$335/acre)	10¢/lb	24.8¢/lb
2,500 lbs/acre	13.4¢/lb (\$335/acre)	10¢/lb	23.4¢/lb
2,750 lbs/acre	12.1¢/lb (\$335/acre)	10¢/lb	22.1¢/lb
3,000 lbs/acre	11.1¢/lb (\$335/acre)	10¢/lb	21.1¢/lb

** Harvesting and handling costs have been varied from 12¢ to 10¢ to reflect the influence of good yields in lowering harvesting rates.*

Production costs vary considerably from grower to grower, depending on the condition of the fields, the location and the management program. The harvesting and handling cost per pound for hand raking varies with labor availability, yield per acre and field conditions. Mechanical harvesting costs will also vary depending on yield and field conditions. Growers with low yielding or poorly managed fields must pay higher harvesting costs than those with weed free, high yielding fields. Because of the great variations between growers' costs, it is difficult to determine meaningful average production and harvesting costs for growing lowbush blueberries. Each operation must be assessed on the basis of its production, location, yield, management plan and the variable cost factors mentioned on the preceding page.

The following form could be used by all growers in order to determine their own production and harvesting costs.

Table I - Production and Harvesting Costs Using Burning and Hand Harvesting

Production Cost Per Acre

Pruning	\$
Weed Control	\$
Disease Control	\$
Insect Control	\$
Pollination	\$
Fertilization	\$
Taxes	\$
Machinery & Equipment	\$
Miscellaneous	\$
Total	\$ _____ per acre

Harvesting Costs (¢/pound)

Picking	_____ ¢
Supervision	_____ ¢
Supplies & Equipment	_____ ¢
Transportation	_____ ¢
Total	_____ ¢ per pound

The production cost per pound is calculated by dividing the yield per acre into the production cost per acre. By adding this cost to the harvesting cost, the total production and harvesting cost per pound is obtained. This can then be compared to the market price for berries to determine profit or loss per pound of berries produced.

Total Production and Harvesting Cost Per Pound

Production Cost Per Pound	_____ ¢
Harvesting Cost Per Pound	_____ ¢
Total Cost of Production and Harvesting Per Pound	_____ ¢

Profit or Loss

Market Value of Blueberries	_____ ¢ per pound
Cost of Production & Harvesting	_____ ¢ per pound
Profit or Loss	_____ ¢ per pound

Section II - Marketing

The Marketing System

The bulk of Nova Scotia's annual lowbush blueberry crop is sold to processors and frozen for eventual resale to blueberry product manufacturers. A well-defined marketing system has evolved for getting the crop from the field to the end user. To help in describing this system, there are several terms which should be defined.

1. A **grower** is a person who grows and harvests blueberries. A grower may or may not be a buyer or processor.

2. A **buyer** is a person who buys blueberries from the **grower** and sells to the processor. The **buyer** is usually, but not necessarily, a **grower** himself.

3. A **processor** is a person who buys blueberries from the **buyer** or directly from the **grower**. The processor (freezes) these berries at this plant. They are then either resold immediately or stored and held for future sales. Some **processors** are also large **growers**.

4. A **manufacturer** is a person who buys blueberries (mostly frozen but sometimes fresh) for use in the manufacturing of blueberry pies, tarts, muffins, etc., or other manufactured products.

The **buyer**, is an important link in the marketing chain and has done a lot to develop the blueberry industry in Nova Scotia. The **buyer** has helped to create a ready market for many small growers and has also provided them with a great many necessary custom services. There are approximately 25 **buyers** in the province of Nova Scotia at present. Most of these **buyers** are also large **growers**.

Many **buyers** supply the necessary harvesting and marketing equipment, such as rakes, pails and field cleaners, to **growers**. Sometimes, they provide picking crews (paid for by **growers**) to harvest the crop. Boxes for harvesting and transporting the berries are provided by the **processor**. Most **buyers** and **processors** own burners and flail mowers and will custom-prune fields. Many **buyers** and **processors** also provide services such as weed control work, spraying and fertilizing, hives for pollination, etc. on a custom basis. All of this, of course, means that each grower does not have to invest a lot of money in supplies and equipment.

Most **buyers** have collecting points or receiving stations set up where they receive the blueberries. At these stations, the berries are weighed, cleaned and then shipped to a processing plant. All of the Nova Scotia production does not go through **buyers**. A considerable amount is grown by, or sold directly to, the **processor**, and some blueberries are sold fresh on the retail consumer market.

In 1996, 66 percent of Nova Scotia's production was processed by Nova Scotia **processors**, and about 32 percent was shipped fresh by **buyers** to processing plants outside Nova Scotia. Local fresh sales accounted for 2 percent of total production. Up until 1972, approximately 70 percent of the total Nova Scotia processed pack was usually sold to United States **manufacturers**, while the other 30 percent was sold to **manufacturers** in Canada. Beginning in 1972, increasing amounts of Nova Scotia berries were sold to European countries such as West Germany, Sweden, Norway and the Netherlands. From 1977 to 1982, over 60 percent of each year's crop was sold in Europe. Small quantities were sold in Japan in the late 1970's and this market increased steadily for about five years. Since then, there has been a levelling off of demand. Shipments to European markets declined substantially from 1983 to 1985 because of the strength of the Canadian dollar in relation to most European currencies. More favorable currency exchange rates returned in 1986 and have resulted in a revival of European sales since that time. In most cases, shipments of overseas markets are made by refrigerated containers through the ports of Halifax or St. John.

Prices Paid to Growers

Prices paid to the grower over the last forty years are given as follows:

	Average Price	Year	Average Price
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Year	(¢/lb)		(¢/lb)
1956	10.5	1977	62
1957	12.0	1978	50
1958	12.5	1979	38
1959	10.5	1980	45
1960	10.0	1981	48
1961	9.0	1982	60
1962	8.5	1983	40
1963	12.0	1984	30
1964	15.0	1985	25
1965	24.0	1986	45
1966	16.0	1987	60
1967	7.0	1988	60
1968	17.0	1989	60
1969	15.0	1990	42
1970	21.0	1991	55
1971	16.0	1992	50
1972	24.0	1993	35
1973	28.0	1994	40
1974	18.5	1995	40
1975	26.5	1996	70
1976	32.0	1997	60

Prices over this period have fluctuated greatly from a low in 1967 of 7 cents to a high in 1996 of 70 cents. The average price per pound received by growers in the 1950's was 11.8 cents; in the 1960's; this rose to 13.4 cents per pound. During the 1970's, the grower price averaged 31.6 cents per pound; and over the ten year period from 1983 to 1992, the average grower price was 46.7 cents per pound. The average price over the five year period from 1988 to 1992 was 53.4 cents per pound. The price for the 1993 crop dropped dramatically due to an inventory carryover, increased competition from highbush blueberries, and a general down turn in the economy.

Beginning in the mid 1970's, a steadily increasing market demand was stimulated through promotional efforts in Europe and Japan by Nova Scotia's growers and processors, and promotion both in North American and overseas markets by the North American Blueberry Council and the Wild Blueberry Association of North America. New markets in European countries and Japan lessened Nova Scotia's dependence on the U.S. market, and resulted in good prices to growers from 1975 to 1983. The lower prices in 1984 and 1985 resulted from inventory buildup from three successive high production years in most blueberry production areas of the world in 1983, 1984 and 1985. There is a continuing job to be done in selling blueberries in new market areas to cope with the rapid production increases which have occurred in both the highbush and lowbush industries in recent years.

Processing

There are two processing companies in Nova Scotia which freeze blueberries for resale to the manufacturer.

- 1) Oxford Frozen Foods Limited - Oxford, Cumberland County, Nova Scotia and Halfway River, Cumberland County, Nova Scotia
- 2) Rainbow Farms - Rawdon, Hants County, Nova Scotia and Hillaton, Kings County, Nova Scotia

Both companies have Individual Quick Freeze (I.Q.F.) facilities in their plants and have access to adequate storage facilities to handle the amount of berries they process.

Processing Costs

An explanation of costs involved in processing and marketing lowbush blueberries is given below. Various costing systems are used by different processors but it is generally agreed that total processing costs, excluding transportation, duty and brokerage charges, may run between 40 and 50 cents per pound. Transportation costs vary with production destination. Duty and brokerage charges are a percent of the selling price, and vary with it.

To illustrate the relationship of processing and marketing costs to finished product, consider the following example. If a processor pays 55 cents per pound for blueberries delivered to his plant, and his total processing and marketing costs based on the cost given above are 45 cents; then that processor must receive at least \$1 per pound for the finished frozen product. This would simply cover costs and not allow for transportation, duty and a margin of profit. A brief explanation of some of the processing and marketing costs is presented below to give an indication of various items which make up the total cost picture.

Shrinkage

This item refers to the loss in weight due to dirt, small berries and other foreign material which is removed as the berries go through the cleaning and processing lines. The amount of shrinkage is variable but will usually run somewhere between 10 and 15 percent.

Direct Costs

Labour (handling and inspection product as it moves from field or collecting station through the processing line and into cold storage)

- Storage
- Containers
- Electricity
- Taxes, Dues, Etc.
- Short Term Interest

Overhead

This item includes all equipment and facilities, maintenance and repairs, insurance, company administration, interest on financing, depreciation, etc.

Marketing Costs

Duty and Brokerage Charges

These are a necessary part of the marketing process. They are calculated as a percentage of the selling price and vary with it. Duty does not apply to berries sold on the Canadian or U.S. market, but berries shipped to overseas markets may be subject to import duties as set by the importing country.

Transportation Charges

These charges vary with the destination of the product but will generally run between ten and twenty cents per pound for overseas destinations.

Foreign Exchange

The strength of the Canadian dollar relative to the currency of the purchasing country is a cost which fluctuates on a continuing basis and can be an important factor in determining the price received for berries sold outside of Canada.

Fresh Markets

A small percentage of the annual lowbush blueberry crop is sold each year on the fresh market. There are about a dozen commercial operations marketing fresh fruit in Nova Scotia. About 200,000 pounds were sold fresh in 1997. The fruit is packaged in 10-pound boxes, 5-pound boxes and pint or quart containers.

Sales are mostly to retail store chains or fruit stands. Some packers work with service clubs or other groups who sell boxes of fresh blueberries as a fund-raising project.

Selling berries on the fresh market requires more labour and special materials and equipment to do a proper job. There is, however, a good opportunity for development of substantial sales if a producer is willing to expend some time and effort to set up an efficient operation, develop a marketing system and put out a high quality product.

Prepared by: Dale McIsaac, Blueberry Specialist, Production Technology Branch
Nova Scotia Department of Agriculture and Marketing, Nappan, NS, B0L1C0

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