52. Harvesting Wild Blueberries

HARVEST TIME

In fields, harvesting begins when 90% of the blueberries are ripe, usually at the beginning of August. In forest operations the harvest generally starts 7 days later. Harvesting continues over a period of 3 to 5 weeks, the workers often being in the fields and forests at the crack of dawn. Others work at night to take advantage of the cool. Harvesting is also done on rainy days.

EQUIPMENT NEEDED

In blueberry fields:

- mechanical or motorized harvester;
- car or truck;
- trailer;
- clothing suitable for different weather;
- plastic crates supplied by the buyer.

In forests:

- car or truck;
- trailer;
- ATV (for rough roads);
- camper, tent or other temporary shelter;
- camping equipment;
- clothing suitable for different weather;
- food supplies;
- berry rake;
- harvest containers (e.g. 5-gallon plastic pails);
- forest maps (for unfamiliar harvest areas);
- plastic crates supplied by the buyer.

To facilitate the traceability of forest-harvested blueberries, since 2009 buyers in two areas of Québec are required to do the following:

- for forest blueberries:
  - supply size 2 crates, which can hold 11.3 to 13.6 kg (25 to 30 lb);
  - clearly identify on a forest map where the blueberries were harvested.
- for field blueberries:
  - supply size 3 crates, which can hold 15.9 to 18.1 kg (35 to 40 lb).

These requirements only apply to the Saguenay–Lac-Saint-Jean and the La Tuque MRC (territories under supply management).

HARVESTING FIELD-GROWN BLUEBERRIES

Increasingly, field-grown blueberries are harvested using different types of mechanized or motorized harvesters. With such a machine (Figure 1), two workers can harvest up to 1500 kg of blueberries per day. High-performance machines (Figure 2) can harvest up to 4000 kg per day.

Figure 1. Motorized harvester
Source: Club Conseil Bleuet

Figure 2. High-performance motorized harvester
Source: Club Conseil Bleuet

Large blueberry fields (e.g. on public lands)

Large fields are divided into parcels to facilitate the harvest, and the parcels assigned to pickers in whatever way works best for the producer:

- by drawing lots, since parcels can vary considerably in productivity and ease of picking;
- by the order in which pickers arrive at the field;
- based on the experience and seniority of the pickers.

Giving each parcel a number will make it easier to plan the harvest, verify the quality of the crop, and ensure that no part of the field is overlooked.

To encourage pickers to stay through to the end of the picking season, some producers alternate harvesting between more productive and less productive parcels, making sure to reserve some productive parcels for the last week of harvest.

Pickers bring their full crates to the weigh station to have them weighed and to receive their weight tickets. The crates are then stacked on pallets and identified before being loaded into trailers for trucking to the freezing plants.

To avoid congestion at the freezing plants, harvesting should be spread over at least 3 weeks. The plants generally set quotas for the number of crates that can be delivered per day.

Small blueberry fields

At smaller operations, harvesting is usually done by the owner and his family, though occasionally it is done on contract. At the end of the day the pickers go to the freezing plant or an authorized buying station, where weighing is done and the pickers are paid for the day's harvest.

HARVESTING FOREST BLUEBERRIES

Each year in Québec, harvesting wild blueberries in the forest is an important economic activity for many families. Some pickers start preparing their season as early as June, scouting vast stretches of forest in search of recently logged or burned areas. Since the blueberry is in bloom at that time of year, promising sites are easily identified. Other pickers wait for the fruit to start forming before they prospect for a picking area. On the website of the Syndicat des producteurs de bleuets du Québec, all of the maps required for forest picking in the upper Lac–Saint-Jean region are available at: *www.spbq.ca/index.php?option=com_content&view=article&id=53&Itemid=97* .

At the end of July normally, pickers set up camp near their harvest areas and the buying stations. When the buying stations open, the forest blueberry harvest begins. The pickers walk the terrain all day looking for blueberries. Picking is done using specially designed hand rakes or combs (Figure 3) with containers for the fruit. In the evening they take the day's harvest to a buying station, sell it and pick up a supply of empty crates.

Figure 3. Hand rake for harvesting blueberries
Source: MAPAQ, Alma

The volume produced by the forest harvest varies from year to year depending on the weather and market prices. The higher the price, the more pickers will be out in the forests, the opposite being true when prices are low.

RECEIVING AT THE FREEZING PLANT

Each day, blueberries from fields or the forest are brought by truck to the freezing plants. Upon reception each lot of blueberries is weighed again, inspected, identified and coded, ensuring its traceability through every step of processing and shipping to customers. Then the blueberries are briefly stored until they can be cleaned and frozen, which is always done within 24 hours of their arrival at the plant. Almost 95% of the Québec harvest is processed in freezing plants before being shipped to Canadian and international markets, primarily Europe, Japan and the United States.

COMPLEMENTARY LEAFLET

53. Quality Control

REFERENCES

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53. Quality Control

INTRODUCTION

As with most small fruits, in wild blueberry production the harvest period is a critical phase in maintaining the quality of the product. For safety reasons, it is essential that precautionary measures be put in place not only during harvest, but before and after as well.

BEFORE HARVEST

Insects and disease can reduce yields and cause a deterioration in the quality of the fruit. This makes it essential to establish an effective scouting and control strategy against these pests. The presence of a heavy population of weeds during harvest can also damage the fruit. Fertilization is another important factor, since healthy, well-fertilized blueberry plants have better tolerance of mechanical stresses and greater resistance to insects and disease.

DURING HARVEST

Harvest is the most stressful time for fruit. The determining factors for obtaining quality blueberries are the operating condition of machinery, the skill and patience of pickers, and favourable weather.

Harvest machines should be greased using food grade grease. The teeth of the comb should be evenly spaced at an average of 4 to 5 mm, though this can vary depending on the average width of the blueberry stems. The height of the comb should be adjusted to the distribution of fruit on the stem. When stems are loaded with fruit from top to bottom, the comb should be placed about 1 cm from the ground. When there is only fruit at the end of the stems, the comb should be raised. To avoid getting soil into the crates, adjust the nose of the picking head so that the comb is perfectly parallel to the ground. Whether using a manual harvester or a motorized one, the speed of progress should be adjusted to the density of fruit. The greater the density of fruit, the more you need to slow down, since going too fast will damage the fruit. As fruit accumulates in the hopper it must be emptied into crates. Weeds getting into the comb must be cleared frequently. All of these considerations are critical to avoid damaging the fruit while reducing the percentage of blueberries left on the ground.

At the end of each day, the harvesters should be cleaned and lubricated. A maintenance record should be kept if you have several machines.

In the case of a non-motorized harvester, it should roll smoothly without the nose tilting up from operator effort.

For motorized pickers, a leak-proof drip catcher should be installed under the oil reservoir. Filling of the gas tank should always be done on a road or in an area where there are no blueberry plants. Before filling the tank, remove all crates from the harvester.

To avoid crushing the blueberries when stacking crates, care must be taken to ensure that crates are filled to a maximum height of 3 cm from the top. When a crate is full, level the accumulated fruit and transfer any surplus to another crate. When you have multiple pickers to manage, set a limit on the maximum weight per crate to discourage overfilling. Some producers even set penalties for exceeding the average authorized weight. Also critical in ensuring quality control is to inspect the pickers' work methods regularly, as well as the condition of their machines. To facilitate such inspections, have all pickers work in the same field.

Certain times are better than others for harvesting. Morning dew is an excellent natural lubricant that limits mechanical damage to the fruit and greatly facilitates picking. The best time to work is therefore in the early morning or on days of fine rain. Hot, sunny days are to be avoided, because the fruit dehydrates and is much more vulnerable to mechanical damage. Some producers go so far as to harvest only at night. Note that when a frost occurs, blueberries dehydrate and become soft, making it practically impossible to harvest them without causing significant damage. In this situation, it is best to wait for a good rain to rehydrate the fruit before resuming the harvest.

AFTER HARVEST

The vehicles and trailers used for shipping the blueberries should be cleaned at the end of each harvest day. Containers of gas or any other dangerous substance must never be carried in the same compartment as the fruit.

After crates of blueberries are stacked on a pallet, the stack should be secured by wrapping it in plastic.

When blueberries are briefly stored in the field or some other location while waiting to be shipped or processed, it is important to avoid any possibility of contamination (by rodents, birds, etc.) that could compromise their quality and safety. Furthermore, it is strictly forbidden to store blueberries in the same premises as fertilizers, pesticides, generators or any other source of chemical contamination. Generally, blueberries should be trucked to the freezing plants within 24 hours after being harvested.

On-farm safety

Outbreaks of food poisoning from farm products such as imported spinach, cantaloupe, green onions, lettuce, basil, carrot juice, etc., have justifiably caused concern among consumers. The publicity around such incidents has done considerable damage to the market for certain fruits and vegetables. To reassure consumers, and to maintain a high standard of quality for their crop, blueberry producers must implement some important safety measures:

- provide pickers with toilets and handwashing facilities;
- prohibit access to the field by domestic animals during the harvest period;
- set up eating areas, or designate places off the field where pickers can take their meals;
- inform and sensitize the pickers about the importance of personal hygiene when harvesting wild blueberries;
- establish a policy on people at risk, i.e. pickers with an infection that represents a risk for the safety of the fruit (gastroenteritis, diarrhea, flu, cold, etc.);
- make available to the pickers antiseptic gel dispensers.

The Canadian Horticultural Council has published a manual for small fruit producers who wish to put in place an on-farm food safety program (see below). It is designed to help growers and processors identify and neutralize all of the potential sources of contamination (chemical, physical and microbiological) that could affect their production.

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54. Traceability: Safety for Consumers and Producers

INTRODUCTION

A traceability system tracks the complete history of the fruit from the field through to the moment it is shipped. It makes possible a precise retracing of every step, input, machine and employee involved in wild blueberry production. Essentially it consists of a set of records and documents that are linked together by reference numbers. If contamination is discovered, the system will reveal at which point it could or could not have happened. For many producers, all the information needed to set up a traceability system is already stored in their memory. All they need to do is copy it onto paper or into the computer.

Setting up a traceability system is a mandatory step in an effective program of on-farm food safety. In 1996, when mad cow disease struck the entire planet, beef producers were unprepared for such a situation. Experts agreed that the failure of traceability systems played a major role in the crisis, costing producers billions of dollars. Since then, several other major crises (foot-and-mouth disease, swine influenza, avian influenza) have weakened consumer confidence in agri-food production systems.

To reassure consumers, to preserve the healthy image of our wild blueberries, and to remain competitive on national and international markets, Québec's blueberry producers must set up traceability systems throughout their operations. This strategy will enable the swift removal of sub-standard product from the distribution chain, so that economic loss is not suffered by the industry as a whole.

IMPLEMENTING A TRACEABILITY SYSTEM ON THE FARM

Several types of record exist. For businesses that do not engage in selling fresh fruit and have no employees or buildings, the basic records are sufficient. Otherwise, careful assessment must be made of which complementary records are required. The idea is to focus on information relevant to maintaining product safety. Setting up a traceability system may appear arduous, but once it is implemented, subsequent management will demand no more than a few hours of work per year. Your farm consultant can help you set up a traceability system that is simple, complete and effective.

Examples of the records described below are provided in the appendices of the *Small Fruit OFFS Manual* (Canadian Horticultural Council, 2010). Certain records can also be obtained from the MAPAQ office in your region.

BASIC RECORDS

Inspection, cleaning, maintenance and repair of equipment

All items of equipment must be assigned reference numbers. For each one, all inspection, cleaning, maintenance and repair operations must be entered into the file. Particular attention must be paid to equipment that comes into direct contact with fruit. During the harvest period, all harvesters including those belonging to pickers must be inspected every 2 days at a minimum. The record should include the following details: date of operation, name of employee, item of equipment concerned, brief description of what was done.

Production inputs

Québec's *Environment Quality Act* obliges farm producers to keep a spreading record with a detailed history of all fertilizing materials spread and any other relevant information. For your traceability system, the record should also cover pesticides, mulches and other production inputs. The following details should be given: dose, spreading method, date of application, product applied, field number, name of the person who applied the product, reference number of the equipment used.

Work record

In this record, enter the dates on which mowing, burning or shredding work was done in each field. For each operation the reference number of the machine that was used, and the name of the operator, must also be entered.

Rotation plan

In this record, identify which fields are in a crop year and which are in a growth year. This record has to be updated before the start of each season.

Cleaning and maintenance of sanitary facilities

Assign a reference number to each facility. Throughout the harvest period, enter the date, the time and the name of the person who cleaned the sanitary facilities. The following details should be covered: emptying toilets, emptying waste receptacles, restocking toiler paper, soap, sanitizer lotions, etc.

COMPLEMENTARY RECORDS

Building plans

For each building, a diagram of the interior must be drawn indicating the location of toilets, gas tanks, storage, pesticide storage, rest room, showers, etc. To complete the record, draw a map showing the arrangement of the buildings relative to each other, with a reference number assigned to each.

Inspection, cleaning, maintenance and repair of buildings

Assign a reference number to each building. At the start of the season, inspect the interior and exterior of each building. The following elements should be noted: holes in walls, condition of light fixtures, cleanliness of premises, security of entries, state of ventilation, presence of mold or other contaminants, weeds, exterior drainage, etc. Record in the same document the steps that should be taken to correct any problems encountered.

Visitor registry

During harvest, visitors should sign a registry before entering the production site. The registry should include the date, the reason for their visit, the person's name and his or her employer.

Harvest and storage of blueberries

In this record, enter the date of the harvest, the quantity harvested, the parcel number, the number of pickers, the reference numbers of harvesters used, and the date and duration of storage. When crates are combined on pallets, each pallet must be given a number.

Shipping

For all small fruits that are trucked away from the place of production, a transportation record (delivery order) must be completed. The following elements are entered: shipping date, cleanliness of vehicle, identification of lots shipped, quantity delivered, destination, person in charge.

Warehouses

This record should be completed for warehouses used for storing blueberries or product containers awaiting their first use. The following elements should be evaluated: the condition of the different components of the warehouse, the state of the walls, the condition of light fixtures, the presence of contaminants or vermin, the cleanliness of the premises, the security of the building. Assign a reference number to each warehouse.

Employee hygiene

The purpose of this document is to help the producer enforce a clear policy on basic hygiene. The following elements should be covered: injuries and diseases, biosafety, production practices, use of gloves, handwashing, etc. This document will serve as a tool in employee training.

Picker record

For each picker, enter the person's name and assign him or her a reference number. Also indicate the reference number of the harvester used by that picker.

Vermin monitoring and control

In this protocol, control methods (traps, baits, chemical products, scaring devices) are entered for each animal pest: birds, rodents, insects and so on. Assign a reference number to each control device, identifying its location on a map. During the harvest period, control devices must be checked once a week. At each inspection, record the presence or absence of vermin in each device. If a recurrent problem is noted, corrective measures should also be recorded.

Information session

This record is for noting information/instruction sessions offered to employees, e.g. on quality standards, personal hygiene, etc. The following elements should be entered: date of session, employee name, instructor name, educational institution, subject of course, pass certificate, employee signature.

Each of the foregoing records should be signed by the person in charge. The reference numbers are crucial, since they are what connect all the records. For example, based on the records it should be possible to identify which repair was done on the machine that harvested the blueberries from a particular field. Beyond traceability, these documents can come in very handy for a producer wishing to improve his technical and economic performance. Ideally, all records should be kept for at least 3 years.

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