



# Growth and Development of the Wild Blueberry

## Introduction

The wild blueberry plant is native to North America. This plant belongs to the plant genus *Vaccinium*. There are 5 species of blueberries which grow in the wild in Canada. The most important are:

1. **Sour top** (*Vaccinium myrtilloides* Michx). This is primarily a forest species. The species has more branches, and the leaves and stems tend to be more hairy. The plants are generally 15 to 60 cm (6 to 24 inches) tall. It is reported that its density decreases following continuous pruning. This species tends to be more productive in the third year, compared to the "low sweet", which is most productive in the second year after pruning. The fruit is blue and covered with a waxy coating called "bloom". The fruit is not as sweet as the common wild blueberry and referred to as "Sour Top"
2. **Wild Low Sweet** (*Vaccinium angustifolium* Ait.). This species is the most common in managed fields, and the forest. The plants can reach heights of 7 to 38 cm (3 to 15 inches). The stems are free of hairs. The fruit is sweet, blue and covered with a bloom that gives it a light, powder-blue appearance. This species includes a sub-species called the Black-fruited Low Sweet (*Vaccinium angustifolium* var. *nigrum*). It has the same characteristics as the Low Sweet, except that the fruit is black with no waxy coating.
3. **Highbush Blueberry** (*Vaccinium corymbosum* L.). This species can be found in many areas, but tends to prefer wetter sites like the edges of bogs and swamps.

In wild blueberry fields, we generally find the two most common species, that is, low sweet and sour-top.

The wild blueberry reproduces by cross pollination. Each seed gives rise to a plant with a different genetic make-up. This is why within each species, there can be significant differences in growth, color, the size and shape of the leaves, resistance to diseases, maturity, flavor, productivity, size, firmness and shape of the fruit.

## Soil and Climatic Preferences

The growth and development of wild blueberries is highly related to soil and climatic conditions.

- **Soil:**

The wild blueberry plant is an acid-loving plant, meaning that it prefers acid soils. Most plants prefer a pH around 6, while blueberries prefer a soil pH of 4.2 to 5.2.

- **Water:**

The wild blueberry plant requires less water than most other cultivated plants, and is fairly well adapted to drought. Despite this adaptation, 2.5 cm (1 inch) of water per week is

required for optimal plant growth. A prolonged water stress in a sprout field may affect the growth and development of buds. In the crop year, drought conditions may signal the plant to abort some fruit, and significantly reduce fruit size.

As with many cultivated plants, poorly drained land will affect the plant's productivity and soil drainage may be required if these conditions exist.

- **Light:**

The wild blueberry plant requires full exposure to sunlight. In shady conditions, plants will develop weak stems with few floral buds. In addition to light intensity, wild blueberry plants also respond to photoperiod (the number of daylight hours). Under long days, the plant grows vegetatively. As the days shorten, vegetative growth stops and the formation of floral buds begin.

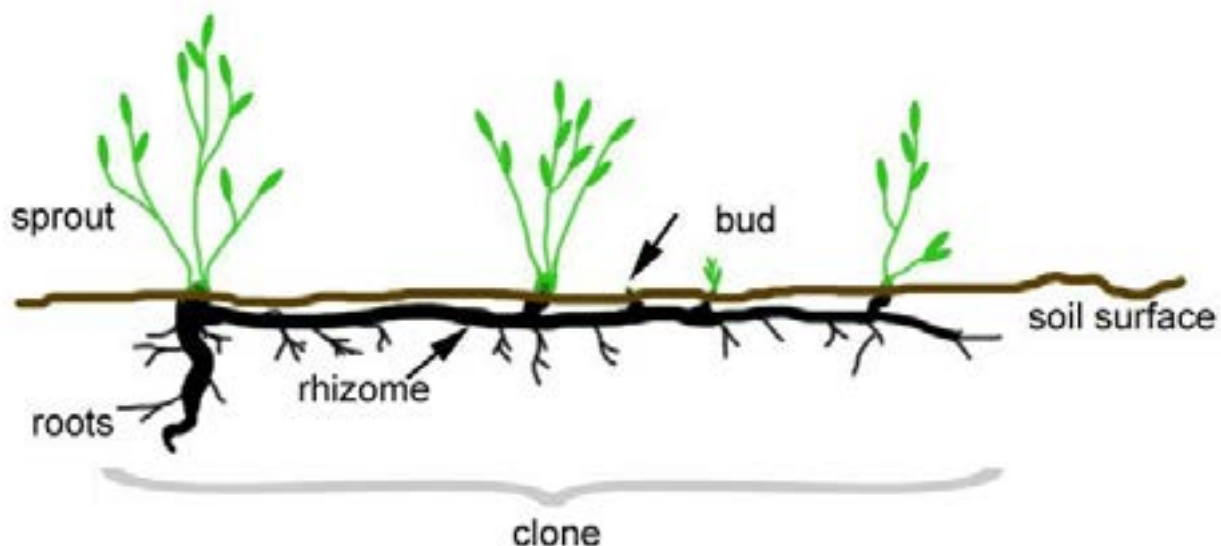
- **Organic matter:**

The soil's organic matter content is a major factor in the growth of wild blueberry plants. Organic matter content plays a very important role in the soil's ability to retain water, and in the availability of nutrients to the plant. Some studies have even demonstrated that growth and yield are directly related to the soil's organic matter content.

### ***Wild Blueberry Plant Development***

Wild blueberry plants develop from seeds. The plant which originates from the germination of this seed is the mother plant. The mother plant develops underground stems (called rhizomes), which allow the plant to spread (Figure 1). Over the years, all the stems produced from the mother plant and the associated rhizomes form a large patch called a clone. Each clone is genetically distinct, and the presence of many clones in a field is necessary for effective pollination.

A wild blueberry plant consists of stems, leaves, flowers and a network of rhizomes and roots. Stems (sprouts) grow from the mother-plant, or from buds which are present on the rhizome. The



**Figure 1.** Wild blueberry plant with rhizome, sprout, bud and roots.

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rhizomes develop under the soil surface in the organic matter layer. Roots develop along the length of the rhizomes and can be found primarily within the first few centimeters of soil.



**Fig. 2.** A wild blueberry stem showing a black tip, when the plant ceases its summer growth

When a stand of wild blueberry plants is pruned, buds on the mother plant or the rhizomes become active and begin to grow. This growth occurs from the beginning of spring until mid-summer when the plants stop growing in height and begin to set the next year's floral buds. The end of vegetative growth is evidenced by the presence of a black tip on the end of the stem (Figure 2). This tip is actually the remnants of the last leaf. Following this, the plant will begin developing buds until growth stops completely late in the autumn. The first year of growth is limited to vegetative growth and prepares the plant for fruit production the following year.

In the autumn, two types of buds can be distinguished. Leaf buds are small and narrow, and are located on the lower part of the stem, to a height of about 2/3 of the stem. The floral buds are rounder and larger, and are located on the upper part of the stem (Figure 3). Sprout length is very variable. This is due to differences in the genetic make-up

of each clone, as well as to differences in growing conditions including; soil fertility, water supply, weed competition, insect damage and disease incidence. Generally, stems should be approximately 15 to 17 cm in height.

Floral bud numbers can vary for the same reasons as those listed above. These numbers are generally related to stem length. A 10 cm stem generally produces an average of 2.5 floral buds, while a 15 cm stem produces 4 floral buds. In many New Brunswick fields, an average of 4 to 5 buds per stem would be considered good.

A dormant cold period is necessary before the plant begins to grow again. The wild blueberry plant is considered hardy, though very cold winters without snow have been known to cause serious damage to both aerial and underground plant parts. The plant is most tolerant to cold around mid-winter in January and February and buds can tolerate winter temperatures as low as  $-30^{\circ}\text{C}$  at this time. Strong and cold winter winds can cause damage to buds on the tip of the plants, as they are the least resistant to cold temperatures.

Under our winter conditions, any production technique which has an impact on reducing wind speed and/or increasing snow accumulation is desirable. Planting or leaving wind-breaks is one such technique (**Factsheet A.4.0**).

After the winter dormancy period, the plants begin to grow again. The floral buds begin to swell, and full bloom generally occurs within 3 to 4 weeks. Each floral bud gives rise to a little stem of flowers. There are generally about 5 to 6 flowers in each floral bud. If pollinated, these flowers will give rise to fruit that is harvested in August or early September. For more information on pollination, refer to **Factsheet B.1.0**.



**Fig. 3.** A wild blueberry stem showing floral buds (large) and leaf buds (narrow)

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The wild blueberry fruit is a berry. Its development occurs from the time when the ovules have been fertilized to harvest. The size of the fruit varies according to the vigor of the plant, the clone genetics, the degree of pollination and the supply of water. The largest fruit generally contain more viable seeds. The fruit does most of its sizing during the 3 or 4 weeks prior to harvest. Under good growing conditions, fruit weight increases by 10 to 15% each week. The average weight of a berry is close to 0.3 grams. A general distribution of fruit size, in relation to diameter of the fruit, is 20% small (less than 6.5 mm), 60% medium (6.5-9.5 mm), and 20% large (greater than 9.5 mm).

After developing their characteristic colors, the fruit stops growing but continues to develop improved flavor and sweetness.

Productivity can vary, mostly because of factors like; clone genetics, soil fertility, water availability, insect damage, disease incidence, growing conditions and degree of pollination. Fruit set is very important and is influenced by the availability of native or introduced pollinators, as well as good weather during the pollination period.

After harvest, the plants will continue to produce leaf and floral buds. However for each successive year following the first harvest, the number of floral buds will decrease and the lateral branches will be shorter and less vigorous unless the crop is pruned. With the passage of time, the plant will become less productive, and pruning will be required in order to re-establish a productive stand.

### **References:**

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