

Blueberry Seed Oil Health and Beauty Benefits

Quick Facts

Name	Blueberry
Scientific Name	<i>Vaccinium</i> sect. <i>Cyanococcus corymbosum</i>
Origin	Native to North America.
Extraction Method	Cold pressed
Color	Green to yellow
Flavor and Fragrance	Sweet, subtle, fruity.
Beauty Benefits	Restores the Skin's Natural Barrier, Fades the Appearance of Dark Spots, Soothes Acne, Reduces the Appearance of Scars, Reduces Under-Eye Puffiness and Dark Circles, Heals Broken Capillaries (Varicose or Spider Veins), Strengthens and Stimulates Hair Growth, Prevents Dandruff, Protects Against Environmental Damage.

Blueberries are a widely distributed group of perennial (lives more than two years) flowering (*angiorperm*) shrubs (woody plants) that produce blue–purple berries. They are classified in the section (taxonomic rank) *Cyanococcus* in the genus (species) *Vaccinium* (a common species of “dwarf” shrubs), in the family Ericaceae (commonly known as the heath or heather family).

Blueberries are found most commonly in acidic and infertile growing conditions. Blueberries are usually prostrate shrubs (having its branches lie just above the ground) that can vary in size from 10 cm (4 in) to 4 m (13 ft.) in height.

The genus *Vaccinium* also includes cranberries, bilberries (or European blueberries), huckleberries (common name given to two closely related species: *Vaccinium* and *Gaylussacia*) and Madeira blueberries (*Vaccinium padifolium*). *V. padifolium* grows at elevations of 800–1,700 m. and is endemic to the islands of Madeira and Porto Santo, Portugal.

COMMERCIAL PRODUCTION TERMINOLOGY

Commercial blueberries—both wild (lowbush) and cultivated (highbush)—are all native to North America, including *Vaccinium caesariense* (a species native to the Eastern U.S.). The most common species of blueberry is *Vaccinium* sect. *Cyanococcus corymbosum* (a highbush variety), which is native to North America and was not introduced into Europe until the 1930s.

LOWBUSH BLUEBERRIES

In commercial production of blueberries, the species with small, pea–size berries growing on ground–level bushes are known as “lowbush blueberries” (synonymous with “wild”). Canada is the leading producer of lowbush blueberries.

HIGHBUSH BLUEBERRIES

The species with larger berries growing on taller, cultivated bushes are known as “highbush blueberries”. The U.S. produces about 40% of the world supply of highbush blueberries.

DESCRIPTION OF THE BLUEBERRY

Wild blueberries reproduce by cross-pollination, with each seed producing a plant with a different genetic composition, causing within the same species differences in growth, productivity, color, leaf characteristics, disease resistance, flavor and other fruit characteristics.

The mother plant develops underground stems called *rhizomes* (bulbs that send out roots and shoots from their nodes), allowing the plant to form a network of rhizomes creating a large patch (called a *clone*) which is genetically distinct.

SOIL

Wild blueberries prefer an acidic soil between 4.2 and 5.2 pH and only moderate amounts of moisture. They have a hardy cold tolerance at higher latitudes.

Highbush (cultivated) blueberries prefer sandy or loam soils (soil composed mostly of sand, silt and a smaller amount of clay, at sand-silt-clay concentrations of 40-40-20%), having shallow root systems that benefit from mulch (a layer of matter on the soil's surface to preserve moisture) and fertilizer (matter added to soil to supply nutrients).

LEAVES

The leaves of highbush blueberries can be either deciduous (are shed in autumn) or evergreen, ovate to lanceolate, and 1–8 cm ($\frac{1}{2}$ –3 $\frac{1}{4}$ in) long and 0.5–3.5 cm ($\frac{1}{4}$ –1 $\frac{3}{8}$ in) broad.

FLOWERS

Floral and leaf buds develop intermittently along the stems of the plant, with each floral bud giving rise to 5–6 flowers and the eventual fruit. The flowers are bell-shaped, white, pale pink or red, sometimes tinged green.

FRUIT

The fruit is a berry (a fleshy fruit without a pit produced from a single flower containing one ovary) 5–16 mm (0.2–0.6 in) in diameter with a flared crown at the end. They are pale green at first, then reddish-purple, and finally uniformly blue when ripe. The berries are covered in a protective coating of powdery *epicuticular wax* (a coating of whitish film that forms on fruits and other plant organs), colloquially known as the "bloom".

The berries generally have a sweet flavor when mature, with variable acidity. Blueberry bushes typically bear fruit in the middle of the growing season. Fruiting times can be affected by local conditions such as climate, altitude and latitude (northernmost geographical region), so the time of harvest in the northern hemisphere can vary from May to August.

Fruit productivity of wild (lowbush) blueberries varies by the degree of pollination, genetics of the clone, soil fertility, water availability, insect infestation, plant diseases and local growing conditions. Lowbush blueberries have an average mature weight of 0.3 grams (0.008 oz.).

THE ORIGINS OF CULTIVATING BLUEBERRIES

First Nations peoples (a term used to identify Indigenous Canadian peoples who are neither Inuit nor Métis, traditionally, people who lived south of the tree line and the Arctic Circle) consumed wild blueberries for millennia before North America was colonized by Europeans.

The species *Vaccinium* has a mostly circumpolar distribution (occurs at high latitudes), with species mainly present in North America, Europe and Asia. Many of the species available for commerce are from

North America, particularly Canada and the U.S. for wild (lowbush) blueberries, and several U.S. states and British Columbia for cultivated (highbush) blueberries.

THE HISTORY OF CULTIVATING BLUEBERRIES

Highbush blueberries were first cultivated in New Jersey around the beginning of the 20th century. North American native species of blueberries are now grown commercially in the Southern Hemisphere in Australia, New Zealand and some South American countries.

The Colombian or Andean blueberry, *Vaccinium meridionale* (also “agraz”, a species in the section *Pyxothamnus*, found in the mountains of Colombia and Venezuela), is wild-harvested and commonly available locally.

THE MANY SPECIES OF BLUEBERRIES

Five species of blueberries grow wild in Canada on forest floors or near swamps (forested wetlands). Wild (lowbush) blueberries are not planted by farmers, but rather are managed on berry fields called “barrens”.

HIGHBUSH	LOWBUSH (WILD)
<i>Vaccinium caesariense</i> (New Jersey blueberry).	<i>Vaccinium angustifolium</i> (lowbush blueberry): acidic barrens, bogs and clearings, Manitoba to Labrador, south to Nova Scotia; and in the United States, from Maine westward to Iowa and southward to Virginia.
<i>Vaccinium corymbosum</i> (northern highbush blueberry).	<i>Vaccinium boreale</i> (northern blueberry): peaty barrens, Quebec and Labrador (rare in New Brunswick), south to New York and Massachusetts.
<i>Vaccinium darrowii</i> (evergreen blueberry).	<i>Vaccinium myrtilloides</i> (sour top, velvet leaf, or Canadian blueberry).
<i>Vaccinium elliotii</i> (Elliott blueberry).	<i>Vaccinium pallidum</i> (dryland blueberry).
<i>Vaccinium formosum</i> (southern blueberry).	
<i>Vaccinium fuscatum</i> (black highbush blueberry; syn. <i>V. atrococcum</i>).	
<i>Vaccinium hirsutum</i> (hairy-fruited blueberry).	
<i>Vaccinium myrsinites</i> (shiny blueberry).	
<i>Vaccinium simulatum</i> (upland highbush blueberry).	
<i>Vaccinium tenellum</i> (southern blueberry).	
<i>Vaccinium virgatum</i> (Rabbiteye blueberry; syn. <i>V. ashei</i>). Considered different from both high- and lowbush varieties.	
Some other blue-fruited species of <i>Vaccinium</i>	
<i>Vaccinium koreanum</i> (Korean blueberry).	

Vaccinium myrtillus (bilberry or European blueberry).

Vaccinium uliginosum (bog bilberry, northern bilberry or western blueberry).

Note: Habitat and range summaries are from the *Flora of New Brunswick*, published in 1986 by Harold R. Hinds, and *Plants of the Pacific Northwest Coast*, published in 1994 by Pojar and MacKinnon.

“Rabbiteye” (*V. ashei* or *V. virgatum*) is considered different from both high- and lowbush. The lowbush varieties are still grown in a similar manner to pre-Columbian semi-wild cultivation, e.g. “slash and burn”.

Slash-and-burn agriculture is a farming method that involves the cutting and burning of plants in a forest or woodland to create a field called a “swidden”. The method begins by cutting down the trees and woody plants in an area. The downed vegetation, or “slash”, is then left to dry, usually right before the rainiest part of the year.

Then, the biomass is burned, resulting in a nutrient-rich layer of ash which makes the soil fertile, as well as temporarily eliminating weed and pest species. After about 3–5 years, the plot's productivity decreases due to depletion of nutrients coupled with weed and pest invasion, causing the farmers to abandon the field and move over to a new area.

The time it takes for a “swidden” to recover depends on its location and can be as little as five years to as much as twenty years, after which the plot can be slashed and burned again, repeating the cycle. In Bangladesh and India, the practice is known as “jhum” or “jhum”.

IDENTIFYING “TRUE” BLUEBERRIES

Commercially offered blueberries are usually from species that naturally occur only in eastern and north-central North America. Other sections in the species are native to other parts of the world, including the Pacific Northwest (the geographical area of the U.S. bounded by the Pacific Ocean) and southern U.S., South America, Europe and Asia.

Several other wild shrubs in many of these regions produce similar-looking edible berries, such as huckleberries and whortleberries, some of these are: the lingonberry or red whortleberry, *Vaccinium vitis-idaea*, the bog whortleberry, *Vaccinium uliginosum*, or the predominantly European bilberry, blaeberry, wimberry or whortleberry, *Vaccinium myrtillus* (a *holarctic* species). These species are sometimes called “blueberries”, and are sold as blueberry jam or other products.

The names of blueberries in languages other than English often translate as “blueberry”, e.g. Scots *blaeberry* and Norwegian *blåbær*. *Blaeberry*, *blåbær* and French *myrtilles* usually refer to the European native bilberry (*V. myrtillus*), while *bleuets* refers to the North American blueberry. Russian *голубика* (“blue berry”) does not refer to blueberries, which are non-native and nearly unknown in Russia, but rather to their close relatives, bog whortleberries (*V. uliginosum*).

V. Cyanococcus blueberries can be distinguished from the nearly identical-looking bilberries by their flesh color when cut open. Ripe blueberries have light green flesh, while bilberries, whortleberries and huckleberries are red or purple throughout.

THE NUTRIENT CONTENT OF BLUEBERRIES

Blueberries contain moderate levels of essential dietary minerals and dietary fiber (the parts of plants that cannot be completely broken down by digestive enzymes). Generally, the nutritional contents of blueberries are a low percentage of the DV (Daily Values).

A 100 gram serving provides a relatively low caloric value (57 kcal) with a glycemic load (GL, a number that estimates how much the food will raise a person's blood glucose after ingestion) of 6.

Value per 100 g (3.5 oz.) blueberries, raw

Energy	240 kJ (57 kcal)	
Carbohydrates	14.49 g	
Sugars	9.96 g	
Dietary fiber	2.4 g	
Fat	0.33 g	
Protein	0.74 g	
Vitamins	Quantity	% DV[†]
Vitamin A equiv. beta-Carotene	32 µg	0%
Lutein zeaxanthin	80 µg	0%
Vitamin A	54 IU	
Thiamine (B ¹)	0.037 mg	3%
Riboflavin (B ²)	0.041 mg	3%
Niacin (B ³)	0.418 mg	3%
Pantothenic acid (B ⁵)	0.124 mg	2%
Vitamin B ⁶	0.052 mg	4%
Folate (B ⁹)	6 µg	2%
Vitamin C	9.7 mg	12%
Vitamin E	0.57 mg	4%
Vitamin K	19.3 µg	18%
Minerals	Quantity	%DV[†]
Calcium	6 mg	1%
Iron	0.28 mg	2%
Magnesium	6 mg	2%
Manganese	0.336 mg	16%
Phosphorus	12 mg	2%
Potassium	77 mg	2%
Sodium	1 mg	0%
Zinc	0.165 mg	2%
Other Constituents	Quantity	
Water	84 g	

[†]Percentages are roughly approximated using US recommendations for adults.

Source: [USDA FoodData Central](#)

THE PHYTOCHEMISTRY OF BLUEBERRY SEED OIL

The active chemical compounds in blueberry seed oil are essential fatty acids (Omega 3 and 6). The most abundant is linoleic acid, which helps to reduce inflammation, lowering the risk of acne, eczema and psoriasis. Followed by alpha linoleic acid, which helps keep skin hydrated. Oleic acid, palmitic acid and stearic acid can also be found in smaller amounts.

Palmitic Acid (C ₁₆ :0)	3.5–7.0%
Stearic Acid (C ₁₈ :0)	0.6–6.0%
Oleic Acid (C ₁₈ :1; ω–9)	16–25.0%
Linoleic Acid (C ₁₈ :2; ω–6)	41–57.0%
α–Linoleic Acid (C ₁₈ :3; ω–3)	16–27.0%

*Fatty acid breakdown is shared from [Modern Cosmetics Volume 1](#).

Vitamin E and *tocopherols* are remarkably abundant nutrients in blueberry seed oil. *Tocotrienols*, a certain type of vitamin E abundant in this specific oil, is dubbed to be more potent than vitamin E itself in its protection against environmental and UV damage. Vitamin A promotes cell turnover and collagen production. Vitamin C is an antioxidant that brightens skin.

Phytosterols make up a staggering 580 mg per 100 grams. This is among the highest sterol concentration in an oil, even surpassing soybean oil. *Phytosterols* act as anti-inflammatory agents, helping skin repair itself, they create a moisturizing effect by reducing trans-dermal water loss.

Another compound found in large quantity in blueberry seed oil is *squalene*, which helps cracked skin regenerate and also prevents UV damage. Other less abundant compounds are *proanthocyanidins*, powerful antioxidants that help reduce the appearance of fine lines and wrinkles, and *carotenoids* like *quercetin*, a flavonoid with anti-inflammatory properties.

Blueberries contain *anthocyanins* (or *anthocyanins*, water-soluble vacuolar pigments that, depending on their pH, may appear red, purple, blue, or black), other *polyphenols* and various phytochemicals (chemical compounds produced by plants) are under preliminary research for their potential biological effects.

Most *polyphenol* studies have been conducted using the highbush cultivar of blueberries (*V. corymbosum*), while content of *polyphenols* and *anthocyanins* in lowbush (wild) blueberries (*V. angustifolium*) exceeds values found in highbush cultivars.

BLUEBERRIES AS FOOD

Blueberries are sold fresh or are processed as individually quick frozen (IQF) fruit, purée (cooked and blended to the consistency of a paste), juice, or dried or infused berries. These may then be used in a variety of consumer goods, such as jellies (fruit preserves), jams, pies, muffins, snack foods, pancakes, or as an additive to breakfast cereals.

Blueberry jams and jellies are made from blueberries, sugar, water and fruit pectin (a structural acidic *heteropolysaccharide*). Blueberry sauce is a sweet sauce prepared using blueberries as a primary ingredient. Blueberry wine is made from the flesh and skin of the berries, which is fermented and then matured; usually the lowbush blueberry variety is used.

THE CULTIVATION OF BLUEBERRIES

Blueberries may be cultivated, or they may be picked from semi-wild or wild bushes. In North America, the most common cultivated species is *V. corymbosum*, the northern highbush blueberry. Hybrids of this with other *Vaccinium* species adapted to southern U.S. climates are known collectively as "southern highbush blueberries".

So-called "wild" (lowbush) blueberries, smaller than cultivated highbush blueberries, have a more intense color. The lowbush blueberry, *V. angustifolium*, is found from the Atlantic Provinces (Canada) westward to Quebec and southward to Michigan and West Virginia. In some areas, this species produces natural "blueberry barrens", where it is the dominant species covering large areas.

Several First Nations communities in Ontario are involved in harvesting wild blueberries. "Wild" has been adopted as a marketing term for harvests of managed native stands of lowbush blueberries. The bushes are not planted or selectively bred (very little to no human intervention), but they are pruned or burned every two years, and pests are "managed".

Numerous diverse highbush cultivars of blueberries are available, each with individual qualities. A blueberry breeding program has been established by the [Agricultural Research Service](#) (ARS), the principal in-house research agency of the [United States Department of Agriculture](#) (USDA) breeding program at Beltsville, Maryland, and Chatsworth, New Jersey.

This program began when Frederick Vernon Coville, chief botanist of the USDA-ARS collaborated with Elizabeth Coleman White (an agricultural specialist) of New Jersey, in the early part of the 20th century. White offered pineland residents cash for wild blueberry plants with unusually large fruit. After 1910 Coville began to work on blueberries, and was the first to discover the importance of soil acidity (blueberries need high pH), that blueberries do not self-pollinate and the effects of cold on blueberries and other plants.

In 1911, he began the research program in conjunction with White, who was also daughter of the owner of the extensive cranberry bogs at Whitesbog in the New Jersey Pine Barrens (also known as the "Pinelands", the largest remaining of the Atlantic coastal Pine Barrens ecosystems). His work doubled the size of some fruit strains, and by 1916, he had succeeded in cultivating blueberries, making them a valuable crop in the Northeastern U.S. For this work he received the George Roberts White Medal of Honor from the [Massachusetts Horticultural Society](#) (MassHort).

The "Rabbiteye" blueberry (*Vaccinium virgatum* syn. *V. ashei*) is a southern type of blueberry produced from the Carolinas to the Gulf Coast states. Production of "Rabbiteye" blueberries was a focus in Texas in the early 21st century. Other important species in North America include *V. pallidum*, the "hillside" or "dryland" blueberry. It is native to the eastern U.S., and common in the Appalachians (Appalachian Mountains) and the Piedmont (a plateau region) of the Southeast. *V. arboreum*, or "Sparkleberry", is also a common wild species on sandy soils in the Southeast.

Successful blueberry cultivation requires attention to soil pH (acidity or basicity) measurements in the acidic range. Blueberry bushes often require supplemental fertilization, but over-fertilization with nitrogen can damage plant health, as evidenced by nitrogen-burn visible on the leaves.

GROWING REGIONS FOR BLUEBERRIES

Significant production of highbush blueberries occurs in British Columbia, Maryland, Western Oregon, Michigan, New Jersey, North Carolina and Washington State. The production of southern highbush varieties occurs in California, as varieties originating from [University of Florida](#), Connecticut, New

Hampshire, [North Carolina State University](#) and Maine have been introduced. Peru, Spain and Mexico have also had significant production, as of 2018.

United States

In 2018, Oregon produced the most cultivated blueberries, recording 59 million kg (131 million pounds), and an amount slightly exceeding the production by Washington State. Other producers in descending order of production volume for 2017 were Georgia, Michigan, New Jersey, California and North Carolina.

Hammonton, New Jersey produces over 80% of the state's cultivated blueberries. The town claims to be the "Blueberry Capital of the World". Every year this town hosts a large festival to celebrate the fruit drawing thousands of visitors.

Maine is known for its wild blueberries, they are the state's official fruit. But Maine's lowbush (wild) and highbush blueberries combined account for only 10% of all blueberries grown in North America. Some 44,000 hectares (110,000 acres) are farmed, but only half this acreage is harvested each year due to variations in pruning practices.

Canada

Canadian production of wild and cultivated blueberries in 2015 was 166,000 tonnes valued at \$262 million, the largest fruit crop produced nationally accounting for 29% of all fruit value. British Columbia was the largest Canadian producer of cultivated blueberries, yielding 70,000 tonnes in 2015, and the world's largest production of blueberries by region.

Atlantic Canada contributes approximately half of the total North American lowbush (wild) annual production with New Brunswick (one of the three Maritime provinces and one of the four Atlantic provinces) having the largest in 2015, an amount expanding in 2016.

Nova Scotia and Prince Edward Island are also major producers. Nova Scotia recognizes the wild blueberry as its official provincial berry, with the town of Oxford known as the "Wild Blueberry Capital of Canada".

Québec is another major producer of wild blueberries, especially in the regions of Saguenay–Lac–Saint–Jean (where a popular name for its inhabitants is *bleuets*, or "blueberries") and Côte–Nord, which together provide 40% of Québec's total provincial production.

This wild blueberry commerce benefits from vertical integration (in microeconomics, an arrangement in which the supply chain of a company is part of and owned by that company) of growing, processing, frozen storage, marketing and transportation within relatively small regions of the province.

On average, 80%, or 21 million kg (23,000 short tons) of Québec wild blueberries are harvested on farms, the remaining 20% or 5 million kg (5,500 short tons) being harvested from public forests. Some 95% of the wild blueberry crop in Québec is frozen for export out of the province.

Europe

Highbush blueberries were first introduced to Germany, Sweden and the Netherlands in the 1930s, and have since been spread to numerous other European countries. *V. corymbosum* only began cultivation in Romania in a few years leading up to 2018, and rapidly increased in production and sales during that time (as with berries in general).

Southern Hemisphere

In the Southern Hemisphere, the countries of Brazil, Chile, Argentina, Peru, Uruguay, New Zealand, Australia, South Africa and Zimbabwe grow blueberries commercially. In Brazil, blueberries are produced in the states of Rio Grande do Sul, Santa Catarina, Paraná, São Paulo and Minas Gerais.

Blueberries were first introduced to Australia in the 1950s, but the effort was unsuccessful. In the early 1970s, the [Victorian Department of Agriculture](#) imported seed from the U.S. and a selection trial was started. This work was continued into the mid-1970s when the [Australian Blueberry Growers' Association](#) (ABGA) was formed.

In the 21st century, the industry grew up to 400% in Argentina according to a 2005 report by the [U.S. Department of Agriculture](#). In the [Bureau of International Labor Affairs](#) *List of Goods Produced by Child Labor or Forced Labor* report of 2014, an annual publication issued by the [U.S. Department of Labor](#), blueberries were listed among the goods produced in such working conditions in Argentina.

THE PESTS AND DISEASES OF BLUEBERRIES

As of 2018 *V. corymbosum* remains relatively unmolested by pests and diseases in Romania, with *Phytophthora cinnamomi* (soil-borne water mold), *Monilinia vaccinii-corymbosi* (fungi), *Botryosphaeria corticis* (fungi), *Godronia cassandrae* (fungi), *Phomopsis* sp. (fungi), *Botrytis cinerea* (fungi), *Naohidemycus vaccinii* (plant pathogen), *Microsphaera penicillata* var. *vaccinii* (plant pathogen), and various viruses being the most common.

PESTICIDES

Dichlorodiphenyltrichloroethane (DDT), an insecticide infamous for its tremendous environmental impacts began to be used in blueberry cultivation soon after its discovery in 1939, and a few years later in the mid-1940s research began into its use in North America. Because "wild" is a marketing term generally used for all low-bush blueberries, it is not an indication that such blueberries are free from pesticides.

Insecticide modes of action (or MoA, describes a functional or anatomical change at the cellular level resulting from the exposure to a substance, in contrast to mechanism of action, or MOA, which takes place at the molecular level) must be varied to avoid encouraging resistance in the invasive pest *Drosophila suzukii* (or the spotted wing drosophila, a fruit fly). Some insecticides can be counterproductive, harming natural enemies of pests as well.

For example, treatment for *Illinoia pepperi* can reduce populations of its predators. Kaolin clay (a layered silicate mineral) for *Rhagoletis mendax* (or blueberry maggot, a *tephritid* fruit fly) also reduced effectiveness of *Diachasma alloeum* (a small wasp), its *parasitoid*. The pest predator *Harpalus erraticus* (a species of ground beetle in the subfamily Harpalinae) maintains greater abundance with selective insecticides rather than broad-spectrum MoAs.

INTEGRATED PEST MANAGEMENT

Blueberries are naturally relatively unmolested by arthropod pests (invertebrates with an exoskeleton, a segmented body and paired jointed appendages). Nonetheless, there are 24 insect *taxa* known to be pest (organisms) in North America, the worst in New Jersey, Michigan, Maine and Eastern Canada being *Rhagoletis mendax*.

Secondary, but still important are *Acrobasis vaccinii* (the cranberry fruitworm, a moth in the family Pyralidae), *Grapholita packardi* (a large family of tortrix moths), and *Conotrachelus nenuphar* (or plum curculio, a true weevil). These four are the most common targets for development of Integrated Pest Management (IPM) practices.

Recently (as of 2019), IPM research has also taken an interest in *Drosophila suzukii* and arthropods like aphids (small sap-sucking insects members of the superfamily Aphidoidea), that vector diseases such as scorch virus and shoestring virus (or BBSSV, a virus commonly transmitted by the aphid *Illinoia pepperi*, it is prominent in highbush and lowbush blueberries), and cicadellids (or leafhoppers, minute

insects that suck plant sap from grass, shrubs or trees), vectoring the *phytoplasma* (intracellular parasites of plant phloem and of the insects involved in their transmission) that causes “blueberry stunt”.

Managing pests down to the cosmetic level is necessary in this fruit because they are a premium type product. Changes in locale and environment—to new geographies, and into greenhouses (a structure with walls and roof made of transparent material)—has required new pest management regimes, including innovative IPM. Conversely, importing foreign potential enemies into North America may yield good results:

Operophtera brumata (or the winter moth, a moth of the family Geometridae) is a pest of blueberries and [birch trees](#) which is successfully parasitized by *Cyzenis albicans* (a species of fly in the family Tachinidae, it lays its eggs on leaves so that they hatch inside the larvae of the winter moth when the larvae consume the leaves) despite the lack of historical, natural contact between the two.

The same results were obtained with *Scirtothrips citri* (a species of thrips in the family Thripidae) and *Beauveria bassiana* (a fungus that grows in soil and is a parasite on arthropods, causing “white muscardine disease”).

Results are available for *Choristoneura rosaceana* (oblique banded leaf roller or rosaceous leaf roller, a moth of the family Tortricidae) and overwhelming numbers of *Trichogramma minutum* (a species of minute polyphagous wasps that are *endoparasitoids* of insect eggs), and *Cyclocephala longula* (a species of rhinoceros beetle in the family Scarabaeidae) overwhelmed by *Steinernema scarabaei* (a species of nematodes in the family of Steinernematidae).

This has also been attempted with flower thrips (two species of agricultural pests: *Frankliniella tritici*, Eastern flower thrips and *Frankliniella occidentalis*, Western flower thrips) and potential predators but with inconclusive results.

INTERNATIONAL QUARANTINE PROTOCOLS

Rhagoletis mendax is a quarantine pest (a technique for ensuring disease- and pest-free plants, whereby a plant is isolated while tests are performed to detect the presence of a problem) in *phytosanitary* regimes (based on plant pathology knowledge and information) of some countries around the world.

PEST RESISTANT BLUEBERRY CULTIVARS

Insect resistance was not a priority in breeding programs (the planned breeding of a group within a species, involving multiple specimens and extending several generations) until about the year 2000, and is still not a high priority. However it may become more common as it becomes easier, especially using marker-assisted breeding (MAS is an indirect selection process where a trait is selected based on a marker, rather than on the trait itself).






V. ashei is naturally more resistant (HPR describes a range of adaptations evolved by plants to defend against herbivores improving their survival and reproduction) than *V. corymbosum* to *Scaphytopius magdalensis* (a species of leafhoppers in the family Cicadellidae). On the other hand *V. ashei* is less resistant than *V. darrowii* to *Prodiplosis vaccinia* (a species of gall midges, insects in the family Cecidomyiidae).

There is variation between cultivars of *V. ashei* in resistance to *Oberea myops* (beetle). There is variation in resistance among cultivars of *V. corymbosum* to *Acrobasis vaccinii* and *Popillia japonica* (or Japanese beetle, a species of scarab beetle). Wild *V. spp.* have greater resistance than highbush cultivars to *I. pepperi*. There is significant variation between highbush cultivars in abundance of various Tephritidae

(one of two fly families referred to as “fruit flies”), thrips (minute, slender insects with fringed wings and unique asymmetrical mouthparts), and *Homalodisca vitripennis* (or glassy-winged sharpshooter, a large leafhopper insect from the family Cicadellidae).

THE PRODUCTION OF BLUEBERRIES

Blueberry Production—2020

Country	Production (tonnes)
 United States	294,000
 Peru	180,300
 Canada	146,370
 Mexico	50,293
 Spain	48,520
World	850,886

Source: the [Food and Agriculture Organization Corporate Statistical Database](#) (FAOSTAT) of the [United Nations](#) (UN)

In 2020, world production of blueberries (lowbush and highbush combined) was 850,886 tonnes (or metric tons), led by the U.S. with 35% of global production and Peru with 21%.

In 2019, Canada was the largest producer of wild blueberries, mainly in Quebec and the Atlantic provinces, but Canadian production of wild blueberries decreased since 2017 by transitioning to the more profitable cultivated highbush blueberries. British Columbia produced 93% of the Canadian highbush blueberry crop in 2019.

REGULATIONS FOR BLUEBERRIES

CANADA

Canada No. 1 blueberries are all similar in size, shape, weight, and color—the total product can be no more than 10% off-color and 3% otherwise defective.

THE BEAUTY BENEFITS OF BLUEBERRY SEED OIL FOR SKIN

The oil extracted from the seeds of *Vaccinium* sect. *Cyanococcus corymbosum* is used in aromatherapy and in cosmetics. Blueberry seed oil helps soothe, protect, and moisturize skin, hair and nails. If you have some old blueberries sitting in your fridge, consider a zero waste approach by making a [Homemade Blueberry Radiance Mask](#) with blueberries that are too old to eat, but too good to throw out.

Blueberry seed oil can be used on all skin types and particularly sensitive skin. It has an absorption rating of 1, meaning it absorbs quickly and leaves little residue on skin. The high levels of phytosterols and vitamin E play a major factor when it comes to its rapid absorption by the skin. Although high in healthy fatty acids, the oil is light and greaseless, having a low molecular composition. Blueberry seed oil has a comedogenic rating of 1, meaning it has a very low likelihood to clog pores.

1. PREVENTS AND REDUCES THE SIGNS OF AGING

As skin ages, the production of collagen and elastin slows down. This leads to the formation of fine lines and wrinkles. Blueberry seed oil [is a great source of antioxidants](#), vitamins C and E, which help to protect against free radical and UV damage. These are two of the main causes of premature aging.

Blueberry seed oil also helps reduce the breakdown of collagen and improves elasticity, which makes it even better in anti-aging formulations. It is a wonderful emollient that helps keep skin moisturized and reduces irritation.

The *proanthocyanidins* in blueberry seed oil also help to reduce the appearance of fine lines and wrinkles. Skin repair is also essential for preventing [signs of premature aging](#). Vitamins C and A help to stimulate cell turnover and collagen production, which helps keep skin look plump and firm.

2. FADES THE APPEARANCE OF DARK SPOTS

The *proanthocyanidins* in blueberry seed oil help to protect against UV damage, repair sun-damaged skin and improve skin's overall tone. They also help treat damaged skin caused by high levels of radiation and chemotherapy. Skin damage from the sun can also cause dark spots (hyperpigmentation). The Vitamin C in blueberry seed oil brightens skin and reduces the appearance of dark spots.

3. SOOTHES ACNE

Acne is caused by a variety of factors, including inflammation, bacteria and excess oil production. Alpha linolenic acid, linoleic acid, and *quercetin* are all anti-inflammatory agents that can help reduce the swelling and redness associated with acne. The omega-3 fatty acids in blueberry seed oil help to regulate oil production to keep pores from becoming clogged, while keeping skin hydrated.

Detoxifying compounds like [Vitamin C protect the skin from toxins](#) and pollutants. They reduce the appearance of pores by keeping them clear of dirt and oil, and [lower the risk of skin problems](#) like acne and pimples.

4. RESTORES THE SKIN'S NATURAL BARRIER

The skin's natural barrier is responsible for keeping your skin [hydrated and protected from environmental damage](#). When this barrier is damaged, it can lead to dryness, irritation and inflammation. Dry skin conditions like eczema and psoriasis are often caused by a lack of moisture. Blueberry seed oil is rich in omega-3 fatty acids, which are important for maintaining the health of your cell membranes. Healthy fats are also essential for preventing inflammation.

Blueberries make a wonderful skin toner that aids in skin detoxification, maintains pH balance and tightens pores.

5. REDUCES THE APPEARANCE OF SCARS

Scars can be both a physical and emotional burden. Blueberry seed oil can help reduce the appearance of scars and in the healing of cracked lips and lip sores. The vitamin C in blueberry seed oil [helps to promote collagen production and repair damaged skin](#), hair, and nail cells. Check out our post on a homemade [clear nails fungus eliminator recipe](#).

6. REDUCES UNDER-EYE PUFFINESS AND DARK CIRCLES

Dark under-eye circles are often a result of fatigue, allergies or genetics. The *proanthocyanidins* in blueberry seed oil help to reduce the appearance of dark under-eye circles. Puffiness around the eyes is often a result of inflammation or fluid retention. The anti-inflammatory properties of blueberry seed oil can help to reduce puffiness.

7. HEALS BROKEN CAPILLARIES (VARICOSE OR SPIDER VEINS)

Varicose or *spider* veins are caused by the weakening of blood vessels beneath the epidermal (outer most) layer of skin. It is a harmless, albeit unsightly condition that can be seen by the change in the surface appearance of the skin. Blueberries strengthen blood vessels and help heal broken capillaries.

Vitamins C and A, and flavonoids protect our blood vessels from free radical damage. Potassium improves blood circulation and benefits the circulatory system.

THE BEAUTY BENEFITS OF BLUEBERRY SEED OIL FOR HAIR

Blueberry seed oil [is packed with phytochemicals](#), which are plant-based compounds that have a variety of skin, hair and health benefits.

1. STRENGTHENS AND STIMULATES HAIR GROWTH

The omega-3 fatty acids in blueberry seed oil help to nourish, strengthen and stimulate hair growth. Blueberry seed oil can help add shine and luster to dull, lifeless hair. Zinc, iron, potassium, magnesium and B vitamins also improve scalp health and promote hair growth, helping prevent breakage and split ends.

2. PREVENTS DANDRUFF

The omega-3 fatty acids in blueberry seed oil help to relieve the symptoms of scalp conditions like dandruff, psoriasis and seborrheic dermatitis, which can be both painful and embarrassing. Dandruff is a common scalp condition that is characterized by dry, flaky skin. The omega-3 fatty acids in blueberry seed oil help to keep the scalp hydrated, preventing dandruff, and soothe irritation caused by a dry, itchy scalp.

3. PROTECTS AGAINST ENVIRONMENTAL DAMAGE

Vitamins C and E in blueberry seed oil help protect cells from free radical damage. The *proanthocyanidins* in blueberry seed oil also help to protect against UV damage, keeping hair looking healthy and shiny. Since hair and nails are both composed of keratin, blueberry seed oil can be an effective nail treatment. The antioxidants found in blueberry seed oil stimulate the production of new cells, throughout all three stages of cell growth.

THE HEALTH BENEFITS OF BLUEBERRIES

Blueberries are among the most [nutrient-dense berries](#). Blueberries have [powerful antioxidant properties](#), the highest antioxidant content of all the “superfoods”, in fact. Antioxidants are responsible for protecting your body against free radicals, which are unstable molecules (like environmental stressors) that can damage your cells. When it comes to skin, hair and overall physical health, antioxidants are key.

Blueberries are used to make jellies, syrups, and eaten fresh or frozen. They provide many health and beauty benefits due to their abundance in essential nutrients like vitamins, minerals, antioxidants, phytonutrients, flavonoids and dietary fibers.

1. PROTECT AGAINST CANCER

Free radicals are the unstabilized ions that stabilize by stealing electrons from their neighboring molecules, doing so causes oxidative damage. Blueberries are loaded with nutrients such as Vitamins C and A, and other antioxidants such as *flavonoids*, *anthocyanins* and *ellagic acid* that protect our cells and tissues from free radical damage. These nutrients reduce the risk of several cancers such as colon, abdominal, lung, pancreatic, intestinal and breast cancers.

2. REDUCE DNA DAMAGE

Oxidative [DNA damage](#) is an unavoidable part of modern everyday life. It is said to occur tens of thousands of times per day in every cell in your body. DNA damage is [part of the reason we grow older](#).

It also plays an important role in the development of [chronic degenerative diseases](#) like cancer. Because blueberries are high in antioxidants, they can neutralize some of the free radicals that damage our DNA.

In one [2007 4-week study](#), 168 people drank 34 oz. (1 liter) of a mixed blueberry and apple juice daily. After four weeks, oxidative DNA damage due to free radicals was reduced by 20%. These findings agree with two smaller 2013 studies that used [blueberry powder](#) and [fresh blueberries](#).

3. MAINTAIN OCULAR HEALTH

Blueberries help maintain ocular health as vitamin C and other antioxidants protect our eyes from free radical damage, reducing the risk of age-related macular degeneration, [cataracts](#) and glaucoma. A 100-gram serving of blueberries contains 54 mg of vitamin A, an essential nutrient for eyes. Zinc, phosphorus and lutein also contribute to ocular health.

4. REDUCE RISK OF NEURODEGENERATIVE DISEASES

According to a [2009 animal study](#), the antioxidants in blueberries may affect areas of your brain that are [essential for cognition](#). They appear to benefit aging neurons, leading to improvements in cell signaling. Human studies have yielded similar results.

In a [2010 12-week study](#), nine older adults with mild cognitive impairment consumed blueberry juice every day. At the end, they experienced improvements in several markers of brain function. A six-year study [first published in 2012](#), over 16,000 older individuals found that blueberries and strawberries were linked to delays in mental aging by up to 2.5 years.

Vitamins C and A, and other antioxidants such as *flavonoids*, *anthocyanins* and *ellagic acid* [protect our brain cells](#) (neurons) from free radical damage and reduce the risk of neurodegenerative diseases like Parkinson's, Alzheimer's and age-related dementia. Other essential nutrients like zinc, selenium, potassium, magnesium and manganese contribute to neurological health by improving cognitive processes such as sharper memory and better focus.

5. REDUCE RISK OF URINARY TRACT INFECTIONS

It is widely known that cranberry juice can help treat and prevent urinary tract infections (UTIs). Blueberries are closely related to cranberries, so they boast many of the same substances and activities as cranberry juice. Blueberries have rarely been studied for their impact on UTIs, but they [likely have similar effects as cranberries](#).

Blueberries reduce the risk of UTIs as they contain large polymer-like molecules called *proanthocyanidins*. These heavy compounds are called anti-adhesives and [inhibit the growth of *E. coli*](#) and other bacterial colonies, and [help scrub off bacteria like *E. coli*](#) from the inner lining of the urinary tract.

Vitamin C and other antioxidants, like *flavonoids*, found in blueberries protect kidneys and the urinary tract from free radical damage. The diuretic properties of blueberries increase the frequency of urination and promote the removal of toxins.

6. AID IN DIGESTIVE HEALTH

The dietary fibers in blueberries improve bowel movement, relieve constipation, and other gastrointestinal problems such as abdominal pain, gas and bloating. Vitamins C and A, and other antioxidants such as *flavonoids*, *anthocyanins* and *ellagic acid* in blueberries [protect our digestive system](#) from free radical damage. Other nutrients such as zinc, iron, potassium, magnesium and B vitamins also contribute to healthy digestion.

7. STRENGTHEN THE IMMUNE SYSTEM

The immune system is the body's defense mechanism in the prevention and fighting off of diseases, infections and wounds. Blueberries strengthen our immune system as they contain antioxidants. These compounds [protect our immune cells](#) (white blood cells) from free radical damage and reduce the risk of infection. Vitamin C further strengthens immunity by enhancing white blood cell production.

Because of their antimicrobial properties, blueberries reduce the risk of bacterial, viral and fungal infections. Other nutrients like zinc, potassium, iron, magnesium and copper also strengthen immunity.

8. PROMOTE WEIGHT LOSS

Blueberries promote weight loss as they have a low caloric value (57 kcal per 100 grams) and a low glycemic load (6). The dietary fibers in blueberries [provide fullness](#) that help curb overeating, a major cause of weight gain and obesity. Blueberries are made up largely of water (around 84%), which contributes to weight management by improving digestion and enhancing metabolism.

9. SOURCE OF ANTIOXIDANTS

Antioxidants [protect your body from free radicals](#), which are unstable molecules that can damage your cells and [contribute to aging and diseases](#) such as cancer. Blueberries are believed to have one of the [highest antioxidant levels](#) of all [common fruits and vegetables](#). The main antioxidant compounds in blueberries belong to a family of *polyphenols* called *flavonoids*.

One group of *flavonoids* in particular—[anthocyanins](#)—is thought to be responsible for much of blueberries' beneficial health effects. Blueberries have been shown to directly [increase antioxidant levels](#) in your body.

10. ARE ANTI-INFLAMMATORY

The antioxidants, *flavonoids* and other anti-inflammatory compounds present in blueberries [reduce pain and inflammation](#) caused by inflammatory conditions such as arthritis, rheumatism, gout, asthma and bronchitis.

11. REGULATE BLOOD SUGAR

Research in [2006 on the anti-diabetic properties](#) of the Canadian lowbush blueberry (*Vaccinium angustifolium*) suggests that *anthocyanins* in blueberries have beneficial effects on insulin sensitivity and [glucose metabolism](#). These anti-diabetes effects occur with [both blueberry juice and extract](#).

With a low glycemic load of 6, blueberries reduce the rate at which sugar is released into the bloodstream, which prevents sudden spikes in blood sugar levels. Blueberries contain dietary fibers that reduce the absorption of sugar by the bloodstream and help regulate blood sugar levels. The antioxidants in blueberries also contribute to [diabetes management](#).

In a [2010 study](#) of 32 obese subjects with insulin resistance, two blueberry smoothies daily caused major improvements in insulin sensitivity. Improved insulin sensitivity lowers the risk of metabolic syndrome and Type II diabetes, currently two of the world's biggest health problems.

In spite of all their advantages, eat blueberries in moderation as too much sugar may raise your blood sugar above the healthy range and cause inflammations. If you take diabetic medication, consult your physician before adding blueberries to your diet to avoid the risk of a food-drug interaction.

12. MAINTAIN BONE HEALTH

Blueberries make our bones and teeth stronger as they contain calcifying minerals such as calcium, potassium, magnesium and phosphorus. Calcium promotes the growth and development of bones and reduces the risk of osteoporosis.

Potassium neutralizes acid loss and [reduces the loss of calcium](#) from bones. The manganese in blueberries [increases calcium absorption](#) and improves bone density. The magnesium, phosphorus, zinc and vitamin K in blueberries also contribute to improving bone density.

13. REGULATE HIGH BLOOD PRESSURE

In a [2010 study](#) over eight weeks, obese participants with metabolic syndrome who had had a high risk of heart disease noted a 4–6% reduction in blood pressure after consuming 2 oz. (50 g) of blueberries per day.

Other studies have observed similar effects—such as the [2015 study](#) for postmenopausal women with pre- and stage 1–hypertension, and the [2014 six-week study](#) on the effects of ingestion of whole blueberry powder on hypertension. Blueberries contain potassium, a natural vasodilator that [relaxes our blood vessels](#), improves blood circulation and provides relief from high blood pressure (hypertension).

Despite this benefit, eat blueberries in moderation as ingesting too much potassium may drop your blood pressure below normal levels and cause lightheadedness, blurred vision, lethargy, confusion and fainting. If you take blood pressure medication, consult your physician before adding blueberries to your diet to avoid the risk of a food–drug interaction.

14. MANAGE CHOLESTEROL

Oxidative damage is not limited to your cells and DNA. It is also problematic when your LDL (bad) cholesterol is oxidized. In fact, oxidation of LDL cholesterol is the crucial step in heart disease. The antioxidants in blueberries are linked to reduced levels of oxidized LDL.

The dietary fibers in blueberries also help in [managing cholesterol](#). Managing cholesterol levels reduces the risk of atherosclerosis, a condition that leads to hardening and narrowing of the arteries due to the accumulation of plaque and fat deposits in the arterial walls.

A daily 2-ounce (50-gram) serving of blueberries lowered LDL oxidation by 27% over eight weeks in a [2010 study](#) of obese participants with metabolic syndrome. Another [study in 2013](#) determined that eating 2.5 oz. (75 g) of blueberries with a high-carbohydrate, low-fat breakfast significantly reduced the oxidation of LDL cholesterol. This makes [blueberries very good for your heart](#).

15. PROMOTE CARDIOVASCULAR HEALTH

Blueberries promote cardiovascular health as Vitamins A and C, and other antioxidants protect our cardiovascular system from free radical damage. Dietary fibers help manage cholesterol levels, which reduces the risk of cardiovascular problems such as heart attack, stroke and coronary artery disease. Other nutrients like zinc, iron, magnesium and B vitamins also play an important role in improving and maintaining cardiovascular health.

A study in 93,600 nurses found that those with the highest intake of *anthocyanins*—the main antioxidants in blueberries—were at a 32% [lower risk of heart attacks](#) compared to those with the lowest intake.

This was only an observational study. More studies are needed before a definitive claim that the anthocyanins alone caused the reduction in risk. It would be much more informative to know whether blueberries help prevent hard endpoints like heart attacks, which are the [world's leading cause of death](#).

16. REDUCE MICRO TRAUMA AFTER STRENUOUS EXERCISE

Strenuous exercise can lead to muscle soreness and fatigue. This is driven partly by local [inflammation and oxidative stress](#) in your muscle tissues. Blueberry supplements may lessen the damage that occurs at a molecular level, minimizing soreness and reduced muscle performance. In a small [2012 study](#) in 10 female athletes, consumption of New Zealand blueberries accelerated muscle recovery after strenuous leg exercises.

17. HEALTHY PREGNANCY AND NURSING

Blueberries help in maintaining a healthy pregnancy as they are loaded with antioxidants and other phytonutrients. These compounds protect the fetus from free radical damage. The folic acid (folate) in blueberries promotes the [brain development of the fetus](#) and reduces the risk of neural tube defects and *spina bifida*.

Because of their low glycemic load, blueberries regulate blood sugar and reduce the risk of gestational diabetes. Blueberries are equally beneficial for nursing mothers. Other nutrients like zinc, iron, potassium, magnesium and B vitamins also play a significant role in promoting a healthy pregnancy.

Both pregnant and nursing mothers should consult their physician before adding blueberries to their diet to avoid the risk of a food–drug interaction and complications. Always follow doctor’s recommendations and do not overconsume.

THERAPEUTIC USES OF BLUEBERRY SEED OIL

We all know that blueberries are a powerhouse fruit when it comes to eating nutrient–dense foods that promote a healthy body and healthy skin. But the oil pressed from blueberry seeds is also fantastic for your skin when applied as a moisturizer. Blueberry seed oil is a carrier oil that is cold–pressed from the seeds of blueberries. It can be used in serums, lotions, creams and even hair care products since it is hydrating and helps lock in moisture.

- 1. For An Anti–Aging Mask:** Blend a small handful of blueberries, olive oil, crushed oats, Fuller’s Earth (bentonite clay) and honey to form a thick paste. Apply this paste on the face, and leave for 20 minutes. Wash off with lukewarm (*but not hot*) water.
- 2. As An Acne Treatment:** Mash a small handful of blueberries with a little turmeric powder and 3–4 drops fresh lemon juice enough to form a paste. Apply this paste on the face, and leave for 20 minutes. Wash off with lukewarm (*but not hot*) water.
- 3. As A Skin Toner:** Blend a small handful of steamed blueberries, crushed blueberries and enough plain yogurt to form a paste. Apply this paste on the skin, and leave for 20 minutes. Wash off with lukewarm (*but not hot*) water.
- 4. To Exfoliate Dry Skin:** Mash a small handful of blueberries, yogurt and oatmeal to form a paste. Use this paste as a scrub. Wash as usual.
- 5. To Fade Dark Circles:** Add enough aloe vera gel to a small handful of mashed blueberries to form a paste. Gently apply this paste under the eyes, and leave for 10–15 minutes. Gently remove the paste from under the eyes using lukewarm (*but not hot*) water.
- 6. For a Nourishing Mask:** Mash a small handful of blueberries, and add 1 Tbsp. honey and 1 Tbsp. olive oil to form a paste. Apply this paste on the face, and leave for 20–25 minutes. Wash off with lukewarm (*but not hot*) water.
- 7. Face and Neck Moisturizer:** Apply 4–6 drops blueberry seed oil and gently massage it into the skin. It should sink in quickly and leave no greasy feeling on your skin.
- 8. Balm for Irritated Skin:** Apply 2–3 drops blueberry seed oil on newly washed irritated skin by slowly rubbing the oil into the skin until absorbed.

9. **Massage Oil:** The smooth texture and pleasant fragrance of this oil will relax the senses as well as muscle spasms.
10. **For Styling Protection:** Apply 1–2 drops blueberry seed oil on washed hair when ready for styling.
11. **As A Hair Treatment:** Apply 4–6 drops blueberry seed oil to hair and scalp before washing. Wait 15 minutes, wash as usual.
12. **For Itchy Scalp:** Use your fingertips to add 1 tsp. on slightly wet hair roots to soothe scalp and improve hair growth.
13. **For Hair Growth:** Massage hair roots with 3–4 drops blueberry seed oil, and use a wrap for 15 minutes after washing hair.
14. **As A Hair Mask:** Combine 2–3 drops blueberry seed oil with your usual hair mask to benefit from the synergistic effects.
15. **Fight Dandruff:** Apply 2–3 drops blueberry seed oil to scalp and massage with your fingertips before or after showering.
16. **Lip Moisturizer:** Apply 1–2 drops blueberry seed oil on your lips using your finger. It should be absorbed in a matter of minutes. Additionally, you can combine blueberry seed oil with a lip balm in any ratio you see fit.

BLUEBERRY SEED OIL SUBSTITUTES

Baobab seed oil is a great alternative that offers similar benefits to blueberry seed oil. It is wonderful for use in anti-aging formulations and helps protect skin. It is not likely to clog pores and absorbs easily into skin, it can also be used on all skin types.

Red raspberry seed oil is another oil that extracted from berry seeds. It has the same comedogenic rating blueberry seed oil as and helps reduce the appearance of fine lines and wrinkles. It also helps protect skin and repairs the skin's barrier.

PRECAUTIONS

Blueberry seed oil is generally safe to use, it can even be used straight out of the bottle. Avoid use if you are allergic to blueberries or other berries. If nursing or pregnant, consult your physician prior to using blueberry seed oil. Use essential oils with extreme caution on children, be sure that it is safe for use on children. Some brands clearly labels their essential oils “KidSafe” on the bottle if it can be used on children ages 2–10.

Do not apply blueberry seed oil directly to broken or damaged skin. Do not apply directly to open wounds. Never use blueberry seed oil in eyes or in mucous membranes. Blueberry seed oil can cause skin irritation or an allergic reaction. When applying blueberry seed oil topically (on your skin), always perform a 24-hour skin patch test first using 1–2 drops, [read how for further details](#). Since there are so many varieties of the species *Vaccinium*, blueberry seed oils can vary from one manufacturer—or even one bottle—to another. Use only 100% authentic oils. Store in tightly-sealed dark glass containers; in a cool, dark place away from light.

If you are interested in trying blueberry seed oil, be sure to choose a product that is 100% pure and organic. Blueberry seed oil can be found at most health food stores or online. Unrefined blueberry seed oil has a shelf life of about one year, while refined blueberry seed oil has a shelf life of two to three years.