

# Bloodroot

## (*Sanguinaria canadensis* L.)

### Introduction

#### Botanical Information

Bloodroot, *Sanguinaria canadensis* L., is a member of the Papaveraceae family. It is a native spring wildflower that grows in rich woodlands of North America from Nova Scotia to Florida and west to Alabama, Arkansas, Nebraska, and Manitoba. It can grow in full sun, but is more often found in semi-shaded, light-wooded areas with moist, acidic soil. A perennial that grows up to ten inches tall, the plant has a single, basal leaf that can be as wide as eight inches. The flower is located on a separate stalk and is white with a yellow center. Bloodroot is one of the first wildflowers to bloom beginning in late winter and continuing into early spring. The "root", consisting of a thickened rhizome covered with fibrous roots, is easily recognized by its reddish-orange color.

#### Bioactive Components

The main bioactive components of bloodroot are alkaloids, primarily sanguinarine. Others include chelerythrine, berberine, and oxysanguinarine. Sanguinarine has antiseptic and anti-inflammatory properties.

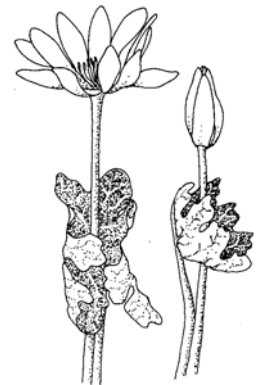
#### Uses and Treatments

Bloodroot was a traditional medicine used by many American Indian tribes to treat fever and rheumatism. Other traditional uses were for treatment of ulcers, ringworm, and skin infections. It was, and still is, used to produce natural red, orange, and pink dyes. Currently, bloodroot is being studied for use as an anti-cancer agent, particularly for the treatment of skin cancer, and as a dissolving agent for skin growths such as warts. Bloodroot has enjoyed some commercial success in toothpaste and mouthwash as an anti-plaque agent. Internal use of bloodroot, however, is not usually recommended. Germany's *Commission E*. has no recommended uses of bloodroot at the current time and many herbalists consider bloodroot too toxic to ever be taken internally. An overdose of bloodroot extract can cause vomiting and loss of consciousness.

### Cultivation Practices

#### Site Selection

Since bloodroot is indigenous to North Carolina, primarily the western part of the state, choosing a site where populations are already present is ideal. Bloodroot prefers a rich moist soil that is well drained with high organic matter content.



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Moisture is important throughout the growing season. Consider that in its natural habitat, it is found in deep shaded to open woodland areas. Select an area with a humus-rich soil and a pH of 5.5 to 6.5. If the soil pH is too low, it can be raised with lime.

Bloodroot can be cultivated under an artificial shade structure or a natural forest canopy at 70%-80% shade. In the woods, bloodroot can be grown intensively in raised beds (referred to as "woods cultivated"), intensively in raised beds under an artificial shade structure (referred to as "shade grown"), or in a low-density, low-input method



Bloodroot with seedpod

mimicking how it grows in the wild (referred to as "wild simulated"). If an open field is used, a wood lath structure or polypropylene shade structure can be built to provide the necessary shade. Make the structure seven ft. tall or higher with two opposite ends open to the prevailing breeze. For woods cultivated or wild simulated, select a site shaded by tall, preferably hardwood trees, where other compatible woodland plants grow such as Jack-in-the-pulpit, mayapple, trillium, wild ginger, or a native stand of bloodroot.

### **Planting**

Bloodroot propagation is typically done through seed or root division. Unfortunately, at the present time, bloodroot seeds are not readily available in large volumes and rootstock is expensive. Bloodroot is easily propagated by dividing the rhizomes in spring or in fall. Plants can be started indoors from seed or seed can be directly sown into the ground, but the rhizome divisions allow for a faster harvestable root.

To plant rhizomes, cut them into vertical sections, two inches in length, making sure there is at least one bud attached. There can be up to 12 buds on the rhizome of one bloodroot plant. In a well-

prepared 3 ft. wide bed, plant rhizome pieces deep enough to cover the top of the rhizome with one to two inches of soil (usually around four inches deep).

Any fibrous roots connected to the rhizome pieces can remain attached. Stagger plantings six inches apart, making sure the bud is pointed upright when placing the rhizome pieces in the ground. Mulch beds with at least three inches of shredded hardwood mulch or leaf mulch. Add mulch as needed throughout the growing seasons and supply adequate moisture. While bloodroot does not grow well in a soggy soil, irrigation should be provided during dry periods. Plants should be ready to harvest four to five years after planting rhizomes.



Bloodroot Rhizome

Bloodroot seeds mature in mid to late spring. Oblong seedpods contain the developing seeds, and when mature, the pods open and seeds pop out. If the seeds are not collected, young seedlings will sprout around the mother plant, usually the following spring. To collect bloodroot seed, pouches can be made out of cheesecloth or fine nylon mesh (bridal veil material) to cover the young seedpods before they spring open. The pouch should be put over the immature pod and tied loosely around the stalk. When the seedpod opens, the seeds are released, but are captured in the pouch, instead of scattering to the ground.

With seedbeds prepared, plant the fresh seeds one to two inches apart, approximately ¼ inch deep. Never allow fresh seed to dry out. Cover with a two-inch layer of leaf mulch and keep moist. Some germination should occur the following year, but many seeds may not emerge until the second spring. Once the plants have developed small rhizomes (usually after two years), they can be transplanted into regular planting beds. Plants should be ready to harvest six years after planting from seeds.



### **Insects and Diseases**

Slugs can cause some damage on bloodroot foliage in damp seasons and in plantings with wet soils or heavy layers of straw mulch. Control methods that can be tried for slugs include beer traps, diatomaceous earth, and copper strips. Animals that forage on bloodroot include deer, groundhogs, and turkey. Standard control methods include fencing and providing an alternate food source.

Diseases that infect bloodroot include *Alternaria* leaf blight, *Botrytis* (gray mold, leaf blight), and root rot (*Pythium*). Leaf blights cause premature defoliation of the plant and can reduce root growth and seed set. To prevent leaf blight, avoid planting in areas with poor air circulation and do not crowd plants. If only a few plants are infected, collect and destroy all foliage with the disease symptoms. If more than a few plants are infected, and a positive identification of the disease has been made, various organic control methods may be tried. No studies on control of leaf blight on bloodroot have been published, but the Organic Materials Review Institute (<http://www.omri.org/>) may be consulted for organic products that are available. Root rots can usually be prevented by planting in raised beds in well-drained soils.

### **Harvesting, Cleaning, and Drying**

Most bloodroot is harvested in the fall, but some is harvested and sold in spring. If harvesting in fall, more than likely the leaves will have died back, making it difficult to know where plants are located unless the beds were clearly marked beforehand. If hand digging, a spade fork works well. For larger scale operations, a ginseng digger or potato digger can be used. Great care should be taken not to damage the roots.

Shake the roots free of soil and carefully remove any roots that are not bloodroot. No foreign matter, such as rocks, weeds, bugs, or metal, should be included with the roots. Protect from the sun and heat and do not allow the roots to dry out. Bloodroot is very susceptible to mold and should

be processed as soon as possible. Wash the roots with a high-pressure stream of water from a hose or with a root washer. A root washer is typically a rotating drum with water nozzles positioned to spray water on the roots as they tumble. All soil must be removed from the roots. This may require breaking some of the larger roots to get them clean.

Once the roots are clean, dry them in a warm place with high airflow. If a herb dryer is not available, a dehydrator, greenhouse, or room equipped with racks, dehumidifier, heater, and fan can be used. Dry roots at about 95°F, with high air-flow, for approximately three to seven days. The goal is to use as low a heat as possible, however, when humidity is high, the temperature in the dryer must be raised. Check roots regularly for mold or deterioration. If roots break without bending, they are dry enough to store. Make sure the larger roots are dried thoroughly. Bloodroot will dry down to approximately 25% of its fresh weight. Once the roots are completely dry, store in burlap sacks, cardboard barrels, or cardboard boxes, in a cool, dark, dry location. Protect from rodents and insects.



Bloodroot rhizomes



Dried roots can be stored for two years. To date, we are unaware of much commercial acreage having been harvested in the United States.

Potential yield per acre of the dried root, based on research plots planted in beds, is estimated at about 1,500 lb. If roots are to be kept for planting stock, plant immediately or store in moist sphagnum moss at about 40°F. Check frequently, stirring with your hands and inspecting for mold and mildew.

## Marketing and Economics

### Annual Consumption and Dollar Value

World consumption of bloodroot has declined over the past 10 years. In 2003, consumption reached about 39,590 pounds of dried bloodroot. In 2004, consumption fell to about 11,487 pounds of dried bloodroot, with a further decline to under 5,328 pounds in 2005. Fresh bloodroot is rarely traded, with only 23 pounds in circulation in 2005.

Dried bloodroot root is sold by collectors or growers to dealers for about \$6 to \$8 per pound, a decrease from about \$10 in 2001.

### Supply and Demand

In 2005, the Commission of European Communities stipulated that continual use of synthetic antibiotic compounds incorporated into livestock feed as a way to fatten cattle must be stopped. This action was taken in response to scientific evidence that these synthetic antibiotics are transmitted to humans via meat consumption and make humans more resistant to certain drugs.

Before that ruling went into effect, a German based company had started using bloodroot as an alternative ingredient to synthetic antibiotics in cattle feeds in Europe. As a result, many growers in North Carolina started growing bloodroot and a NC State University graduate student did her thesis project on propagation of the plant. However, the company soon found an alternative source that



Source: Wise Ways Herbals

was cheaper and grew much faster than bloodroot. We suspect that the low trade volumes beginning in 2003 were the result of that company opting to use Chinese plume poppy (*Macleaya cordata*) as an alternative source for the sanguinarine they needed.

Bloodroot has been used as a traditional Native American dye, with the stem, flower, and roots all being used to make varying shades of yellow and red. Crafters who use the bloodroot for this purpose generally wildharvest plants for their own use, but as more companies are looking to expand into the valuable 'natural' marketplace, it is possible that this dye could be used in place of synthetic dyes and demand could increase.

Bloodroot is also used as a homeopathic expectorant and cough remedy as well as in homeopathic preparations for the treatment of menopause symptoms and headache. It was used as an antibacterial agent in toothpastes and mouthwashes to reduce the build-up of dental plaque in the 1980s. Topically, it is used in escharotic salves for removing skin cancers and moles. There continues to be a small but steady demand for bloodroot for these uses.



The market for native plants should not be overlooked.

Bloodroot has a beautiful flower and is one of the first plants to bloom on the forest floor in the spring. Many residents of Southern Appalachia are buying bloodroot as ornamental plants in home landscaping.



### **Pricing**

Prices for this botanical continue to trade in a low to medium price range compared with other medicinal herbs. Prices paid to wildharvesters, or in the rare case to growers cultivating bloodroot, were in the \$6 to \$8 range at the time of this writing. Wholesale prices for dried bloodroot averaged around \$22, while retail prices averaged about \$41.

### **Distribution Channels**

Bloodroot is wild harvested in North America by small producers located throughout its natural range, mostly along the Appalachian range. Small pockets of cultivation can be found in India, as well as in some areas of the United States and Canada. Distribution channels for this material are highly structured. Established brokers represent a small number of large customers.

### **Commercial Visibility**

As noted, some European companies explored the use of bloodroot in animal feed, but the product was not commercialized on a large scale. In the United States, the Food and Drug Administration (FDA) has not approved the use of bloodroot for this reason.

Of the major nutraceutical/botanical companies in North America and Europe, 15% offer bloodroot as a stand-alone product, while 19% supply this material in a product that contains more than one active ingredient. The majority of bloodroot used for animal or human consumption is sold to European and Asian companies for processing.

The nursery industry is also cultivating bloodroot in North Carolina for landscaping and woodland gardens, which may be a very popular market as native plants continue to gain popularity. Bloodroot plants sell in garden centers and specialty shops from \$3.50 to \$10.00 each.

## **Conclusion**

North Carolina has the potential to become a major producer of cultivated bloodroot, especially in the western regions of the state. Native populations of bloodroot can still be found in many western and piedmont counties.

Core demand for this product in the form of homeopathic remedies, oral care, and skin salves, will keep annual growth steady. Any increase in supply from existing cultivated sources located in North America and India will be more than offset by diminishing supplies of wild-harvested material. While there is demand emanating from many markets and shrinking natural populations, the value of bloodroot over the last 10 years has diminished.

As it gains in popularity, bloodroot planting stock should become more in demand and thus create additional market venues.

## **Resources**

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