

College of Agriculture & Life Sciences
Department of Horticultural Science

Black Cohosh (*Actaea racemosa* L.)

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Introduction

Botanical Information

Black cohosh [*Actaea racemosa* (L.) formerly *Cimicifuga racemosa* (L.) Nutt] is a member of the Ranunculaceae family. It is a native medicinal plant found in rich woodlands from as far north as Maine and Ontario, south to Georgia, and west to Missouri and Indiana. In North Carolina it can be found at elevations up to 4,000 ft and is most common in the western part of the state. It is an herbaceous perennial reaching a mature height of over four ft tall and can grow 18 to 22 inches per month during the growing season. The leaves are large with three pinnately compound divisions and irregularly toothed leaflets. Tall plumes of cream to white flowers, on wand-like flower stalks, bloom from May to July, often towering over six ft. From August to October, seeds develop in capsules that make a rattling sound when shaken. At this stage, the seeds are mature and ready to be harvested.

The black cohosh rhizomes and roots are of economic importance. The rhizome is dark brown to black in color; is thick and knobby; and produces large buds on the upper surface.

The rhizomes are covered with fibrous roots which are usually concentrated on the bottom portion of the rhizome. Throughout the rest of this publication, “root” refers to the rhizome *and* roots unless stated otherwise. When the leaves on the plant start to die back in the fall, the root is harvested, cleaned, and usually dried.

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Bioactive Components

The main bioactive components of black cohosh are the triterpene glycosides, acetin and 27-deoxyacetin, and the isoflavone, formononetin. Other compounds found in the root include aromatic acids, tannins, resins, and fatty acids.

Uses and Treatments

Native Americans used black cohosh for a variety of medical conditions ranging from gynecological problems to snake bites. Physicians made use of it in the 19th century to treat fever, menstrual cramps, and arthritis. In Europe, black cohosh has been used for over 40 years as a treatment for menstrual pain. Other traditional and folk uses were for treatment of sore throats and bronchitis. In recent years, this material has been used as an alternative to mainstream hormone replacement therapy for treatment of menopause and premenstrual syndrome. Black cohosh has been clinically proven to create an “estrogen-like” effect in the user, often reducing unpleasant menopausal symptoms, such as hot flashes and night sweats.

Cultivation Practices

Site Selection

Black cohosh prefers a rich, moist, soil that is high in organic matter. In its natural habitat, it is usually found in shaded or partially shaded areas, although it will grow in full sun.

Black cohosh can be grown successfully in raised beds in the woods (referred to as “woods cultivated”), in raised beds under an artificial shade structure (referred to as “shade grown”), or in a low-density, low-input method mimicking how it grows in the wild (referred to as “wild simulated”). Regardless of the cultivation system used, it is important to choose a site with well-drained, but moist, soil. Black cohosh has been known to tolerate more light and soil variations than ginseng or goldenseal, provided there is adequate moisture available. Raised beds are highly recommended, especially for clay soils or areas that tend to stay wet after a heavy rain. Make sure sufficient compost or other organic material is added to raise the organic matter content of the soil. Soils with pH of 5 to 6 are ideal for growing black cohosh.

If an open field is used for production, until the influence of full-sun on plant growth and root quality is determined, it is recommended that a shade structure be erected. Typically, a wood lath structure or polypropylene shade structure is used. Build the structure seven ft tall or higher with two opposite ends open to the prevailing breeze. For woods cultivated or wild simulated production, select a site shaded by tall, hardwood trees or a mix of hardwood and pine trees. Look for a site where other woodland plants grow such as mayapple, trillium, bloodroot, ginseng, or a native stand of black cohosh.

Planting

Black cohosh is most easily propagated by dividing the rhizomes in spring or fall. Plants can also be started indoors from seed or seed can be directly sown into the ground, but rhizome divisions provide a more uniform plant stand and allow for a faster harvestable root. Plus, large quantities of seed are not readily available at this time.

To propagate by rhizome divisions, cut rhizomes into vertical sections, two to three inches in length, making sure there is at least one bud attached to each piece. There can be up to 15 buds on the rhizome of one black cohosh plant. Any fibrous roots connected to the rhizome pieces should remain attached. In a well-prepared bed, three to five ft wide, plant the rhizome pieces deep enough to cover the top of the rhizome with two inches of soil (usually means digging a four to six inch deep hole or trench). Stagger plantings 18 to 24 inches apart, making sure the bud is pointed upright when placing the rhizome pieces in the ground. Cover beds with at least three inches of shredded

hardwood bark mulch or leaf mulch. Add mulch as needed throughout the life of the planting. Roots should be ready to harvest three to five years after planting.

Black cohosh seeds must be exposed to a warm/cold/warm cycle before they will germinate. The easiest way to grow plants from seed is to harvest the mature seed in the fall and then sow in the ground immediately, allowing nature to provide the necessary temperature changes. To do this, collect the seed when the capsules have dried and started to split open and the seed “rattle” inside. Plant them 1 ½ to 2 inches apart, approximately ¼ inch deep in shaded, prepared seedbeds. Cover with a one-inch layer of hardwood bark or leaf mulch and keep moist. Some germination may occur the following spring, but most seeds will not emerge until the second spring. To speed up the germination process and improve the germination rate, grower Richo Cech suggests exposing the seeds to warm temperature (70°F) for two weeks, followed by cold temperature (40°F) for three months.

If you purchase seed, ask how the seeds have been handled, whether they have been stratified (exposed to warm and cold temperatures) and for how long, and what the anticipated germination rate is. Purchased seed often has a much lower germination rate than seed that has been collected and sown immediately. Purchased seed frequently takes over two years to germinate after sowing. Transplant seedlings into regular planting beds when a second set of true leaves emerges. Roots should be ready to harvest four to six years after seeding.

Insects and Diseases

Common diseases found on black cohosh consist of several leaf spots and root rots, including *Rhizoctonia*. Leaf spots can cause premature defoliation of the plant, reducing root growth and seed set. To prevent leaf spots, avoid planting in areas with poor air circulation and do not crowd plants. Once the disease is identified, 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, an organic fungicide may be applied. No studies on control of leaf spots on black cohosh have been published, but the Organic Materials Review Institute (<http://www.omri.org/>) can be consulted for organic fungicides that can be tried.

Rhizoctonia solani caused damping-off in young emerging black cohosh seedlings in a study done in

Canada. Control of *Rhizoctonia* may be achieved by planting in well-drained soils and by rotating black cohosh plantings with non-susceptible plants, such as corn, to prevent the buildup of pathogenic organisms.

Common insects that attack black cohosh include cutworms and blister beetles. Consult the Organic Materials Review Institute (<http://www.omri.org/>) for approved organic insecticides that can be tried. Other pests that forage on black cohosh include deer, opossum, rabbits, slugs, and snails. Fencing and repellents may be effective in deterring these pests.

Harvesting, Cleaning, and Drying

Most black cohosh is harvested in the fall, primarily because that is when the roots are at their peak in weight and bioactive constituents. There are some buyers who will also purchase it in the spring. The entire root, including rhizome and fibrous roots, is harvested. Digging is usually done by hand using a spading fork.

Shake the harvested roots free of soil and carefully separate out any roots that are not black cohosh. All soil, sand, rocks, and other foreign matter must be removed. Protect from the sun and heat and do not allow the roots to dry out. If the roots are to be used as planting stock, they should be planted immediately or mixed with moist sphagnum moss and stored in mesh bags, burlap bags, or cardboard boxes in a cooler at about 40°F. Check often to ensure the roots do not dry out and stir the roots to aerate and prevent mold and mildew. If the roots will be sold for processing, wash them carefully with a pressure water hose or a root washer. A common root washer consists of a rotating drum with water nozzles positioned to spray the roots as they tumble, thoroughly cleaning them. It cannot be stressed enough how important it is to remove all soil and sand from the roots. This can be challenging because of the knotty nature of black cohosh roots. Some roots will need to be cut to get them clean, but dirty roots will bring a low price or be rejected by the buyer.

If a dried product is desired, once the roots are clean, dry them at low heat with high airflow. If a special herb dryer is not available, a food dehydrator, a bulk tobacco barn, or a small room outfitted with racks, a heater, dehumidifier, and a fan can be used. There are several different temperature regimes for drying black cohosh, but the simplest one is to dry them at 80° to 95°F for several

days to a week. Once the roots are completely dry, store in burlap bags, polysacks, or cardboard drums, in a cool, dark, and dry location. Keep no longer than one year. The dry-down rate for black cohosh is approximately one-third of its fresh weight. Potential yield per acre of the dried roots ranges from 750 to 2,500 lbs per acre.

Marketing and Economics

Annual consumption of black cohosh fluctuates dramatically, as illustrated from 1998 to 2001. In 1998, approximately 700,000 lb of dried black cohosh root were consumed worldwide. In 1999, it dropped to about 183,000 lb and then rebounded sharply to approximately 420,000 lb in 2001. It is estimated that the demand for black cohosh will increase in the next three-to-five years. In 2001, it was estimated that the black cohosh market, in consumption dollars, reached \$2.25 million. Projections of consumption well in excess of 500,000 lb per year are common. Black cohosh prices have been slowly increasing since the autumn of 1999.

Supplies of black cohosh come mostly from the harvesting of native populations. Although prices have risen, a strong response among growers to cultivate this material has not been triggered and only small quantities of cultivated material have made its way to market. Wild supplies, however, are becoming unstable because many of the large, easily harvested wild populations have already been exhausted, and the demand for cultivated material is expected to increase. In 2001, an estimated 10% of the black cohosh sold was from cultivated sources.

Black cohosh buyers (suppliers) are located throughout the natural range of the plant, but are most prevalent in the southeastern United States because that is where the largest concentration of sizeable wild populations exists. Much of the black cohosh that is harvested is sent to Europe for processing and consumption although cultivation efforts are currently underway there.

Customers often require black cohosh with specific levels of triterpene glycosides and isoflavones. With growing health concerns over side effects of hormone replacement therapy, many health professionals are looking to black cohosh and other natural substances as potential treatment options for menopause symptoms. Positive clinical results for black cohosh continue to drive demand for high quality product. This could be a market

opportunities for growers; to produce black cohosh with high triterpene glycoside levels.

In 2001, wild-harvesters and growers were paid approximately \$1.50 to \$2.00 per lb for dried black cohosh. By 2003, prices had risen to \$3.00 to \$5.00 per dried lb. In 2004, prices were back down to \$2.50 to \$3.00 per lb. Certified organic black cohosh, however, was selling for as much as \$25.00 per lb.

Black cohosh was identified as one of the fastest growing herbal products in 1998. It has found its way into a number of commercial products, including the early 20th century product “Change-O-Life” formula and, more recently, “Remifemin”. “Remifemin” is a derivative of black cohosh and was introduced as a prescription drug in Germany in the 1950’s. In 1997, GlaxoSmithKline started marketing it in this country as “Remifemin Menopause”. Of the leading nutraceutical/botanical companies in the United States and Europe, 46% offer black cohosh as a stand-alone product, and 65% offer this material as either a stand-alone product or as part of a multi-constituent supplement.

Black cohosh is also gaining popularity as an ornamental among shade gardeners, nursery container growers, and landscapers. Selections of native species are available as well as varieties with purplish leaves and stems. As a background plant in a shade garden, the gracefulness of this plant, in flower, will hardly go unnoticed. Nursery containers range in price from \$3.95 to \$10.00 per plant.

Conclusion

North Carolina has the potential to become a major producer of cultivated black cohosh, especially in the western regions of the state. Commercial interest in this plant has never been greater. Naturally occurring populations will not satisfy the expected increase in demand over the next three-to-five years. Lack of significant production creates an opportunity for North Carolina growers to fill the gap in supply as wild populations continue to decline.

Black cohosh has never traded at a very high price range for a sustained period of time, but its current price is starting to move upward. Cultivated material will become more prevalent in the supply chain as prices increase.

Since black cohosh can take more than three years to reach a harvestable root size, growers interested in large-scale commercial production should consider planting black cohosh as soon as possible. Once production gets underway, growers can produce their own planting stock, and perhaps offer quantities to other growers.

For Further Reading

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