

Goldenseal – a North American medicinal herb



Figure 1: Leaf, rhizome and root structure of goldenseal

Goldenseal (*Hydrastis canadensis* L.) is a highly valued North American medicinal herb belonging to the family Ranunculaceae. It is found in the north western United States and Canada, from Ontario in the North, to North Carolina in the South. Common names include yellow root, orange root, Indian dye and yellow puccoon. The main active ingredients in goldenseal are the alkaloids hydrastine and berberine. It is used as a muscle stimulant, stomach strengthener, antihemorrhagic and as a laxative. Goldenseal also has some antibacterial activity. Collection of goldenseal from the wild has resulted in its near extinction. However, as a result of intensive cultivation it has become more common.

Description

Goldenseal is a small perennial herb, native to the open woodland areas of the north eastern United States. The plant over-winters as a rhizome with leaves emerging relatively early in spring. The stems grow to about 30 cm and generally have two large, slightly hairy leaves. Plants

grown in New Zealand flower in mid-spring. A small white flower develops on an extension of the main stem above the oldest leaf. The flower develops into a green berry, which later turns bright red when the seeds are ripe. After the fruit has ripened the leaves start to senesce although they often do not completely die until the first frosts.

Pharmacology

All parts of the plants are used for medicinal purposes. However, it is the rhizome that is the most valued component because it contains the highest concentration of active ingredients including 2-4% hydrastine and 2-3% berberine.

Other active ingredients include hydrastinine and canadine. The pharmacological action of goldenseal is thought to result mainly from hydrastine and to a lesser extent berberine. Goldenseal is not commonly mentioned in modern pharmacology literature but is still used for its antibacterial properties and its false reputation as a masking agent for drug concentrations in urine.

Propagation

Goldenseal can be propagated by seed, division of the rhizome, or by root cuttings. Division is the main method used although propagation by seed is also common. However, the seed reportedly requires a three month stratification period or cold storage at 4°C. Propagation by offshoot root cuttings is also possible. Offshoots should be detached from the parent plant in spring, when they are about 10 - 15 cm tall, and transplanted. Transplant shock can be kept to a minimum by leaving as much soil around the root as possible and transplanting the plants quickly.

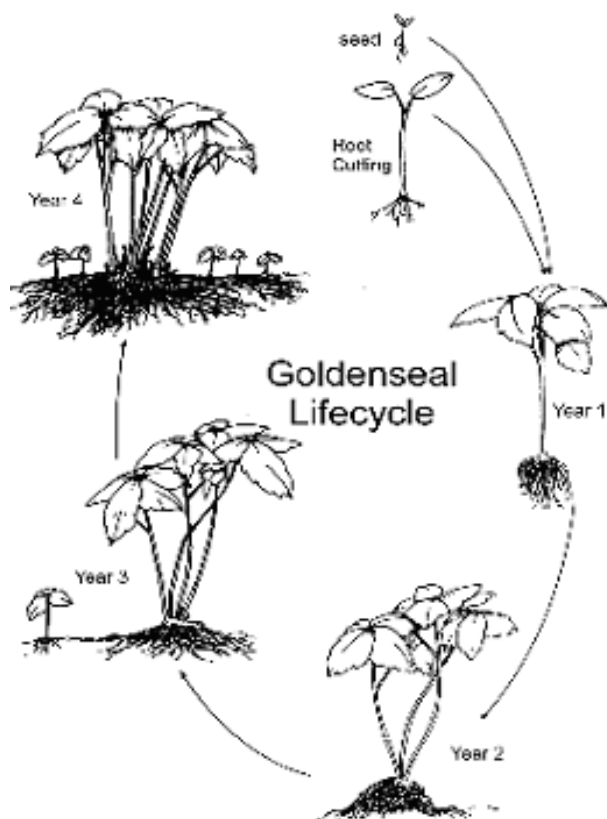


Figure 2: Goldenseal lifecycle.

Production

Goldenseal prefers a rich, friable, well-drained soil. In New Zealand, excellent growth has been achieved on the free draining sandy loam ash soils found in the Waikato and Rotorua areas. In North America, goldenseal is planted out 20 cm apart in rows spaced 25 - 30 cm apart in either late autumn after crop harvest or in spring. Goldenseal requires shade to grow well with 75% shade commonly recommended. Shade can be provided by wooden lath, shade cloth or by growing the crop under a forest canopy. If propagated by division, plants can be harvested after three or four years while seed-propagated plants may require an extra year.

Goldenseal requires similar conditions to ginseng (*Panax quinquefolium*) for good growth and can be included in a crop rotation after ginseng. After five years goldenseal will yield up to 2.5 t/ha dried root. In the Waikato, individual plant dry weight yields after five years were 29.5 g for the rhizome, 28.8 g for the roots, and 31.5 g for the leaves and petioles. After harvesting in late autumn, when the top growth has died down, roots are washed and either air dried or oven dried at approximately 25°C until brittle. The thoroughly dried roots are packed in boxes or barrels for shipping to markets. Historically, goldenseal buyers and prices have tended to vary from year to year so it is essential to obtain up to date marketing information.

Prospects for New Zealand

Goldenseal has a variety of uses and is among the top-selling herbs in the American health food industry. In 1996, goldenseal fetched US\$77.00/kg dry weight for the roots and US\$16.50/kg dry weight for the leaves. If dried properly, it has a long shelf life. Research on goldenseal in the Waikato indicates that it is relatively easy to grow intensively under shade cloth with no major pest or disease problems. In the Rotorua area, goldenseal grows well under pine (*Pinus radiata*) plantations although growth is slower. Provided the demand and price remain high, early indications are that goldenseal has potential as an export crop for New Zealand. Limited access to plant material is currently the main limiting factor to industry development in New Zealand.

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