

has formed. If the collecting area is divided into four quarters and harvesting takes place only in one quarter every year, then the harvest is possible from autumn to spring when the soil is wet and it is easy to dig and 10-15 plants can be harvested per day. The harvesters dig 1 to 2 m deep to find the tubers. Large secondary tuberous roots of the plant are harvested in April to September (after the rains), sliced and dried.

Harvesting methods

Only the secondary root tubers are harvested and the primary root is saved for replanting. Harvesting can be done by hand or cutting the fresh root tubers into slices using a stainless-steel knife or digging stick and a clean cutting board is used for this purpose. The other tools that can be used are spoons, spades, axe and blades.

Local people harvest Devil's Claw according to traditional methods and practices. Presently there are three basic systems/methods:

- Wild harvesting: the harvesters harvest on their own, following traditional methods.
- Controlled/Organised harvesting: native harvesters receive organisational support, training and education from NGOs which they then apply to harvesting.
- Commercial cultivation: Devil's Claw is cultivated and harvested on farms, often pre-existing stock farms.

After harvesting, the long, thin secondary storage tubers are cut into many pieces, each about 2 cm in length.



7. USES

Devil's Claw has been used for numerous conditions in several areas of the world. In South Africa, the root and tuber have been used for centuries as an all-purpose folk remedy used to reduce fever and to relieve pain (e.g. in childbirth, as well as in the treatment of wounds, swellings and boils), to treat allergies and headaches, and to stimulate digestion. Traditional healers also used Devil's Claw to treat inflammatory conditions such as arthritis, rheumatism, and lower back pain. It has also been used as a remedy for liver and kidney disorders and people use it, as a laxative, to treat indigestion and for blood related problems.

Devil's Claw root was also used in folk medicine as a pain reliever and for complications during pregnancies and as a medicine, both traditionally and in Western preparations. In addition, an ointment made from Devil's Claw is used for skin injuries and disorders. The tuber is traditionally used as an analgesic during pregnancy.

In the Western world, Devil's Claw is generally used to treat rheumatism and arthritis. The medicine can be found in the form of pills, capsules, teas, tinctures and creams.

African traditional remedy, Devil's Claw is used by various people in South Africa, including the Khoikhoi and the Bantu. The black fibre of the fruit or "claw" is used in basketry and the dried seeds can be peeled and eaten. The young fruit can be cooked as an okra-like vegetable.

8. ACKNOWLEDGEMENTS

The South African National Botanical Institute and members of Agri-Africa/Karwil Consultancy are herewith acknowledged for the information provided – 2007.

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CONTACT DETAILS

Directorate: Plant Production
Division: Industrial Crops
Private Bag X250,
Pretoria
0001

Tel: +27 12 319 6079

Fax: +27 12 319 6372

E-mail: Thabo.Ramashala@daff.gov.za

Website: www.daff.gov.za



Devil's Claw



agriculture,
forestry & fisheries

Department:
Agriculture, Forestry and Fisheries
REPUBLIC OF SOUTH AFRICA

1. NAMES

Scientific name: *Harpagophytum procumbens*

Common names: Wood spider, Grapple Plant/Thorn, Devil's Claw (English), Duiwelskloof, Beesdubbeltje, Kloudoring, Ouklip, rankdoring, Skerpioendubbeltje, Tubercule De Griffe Du Diable (Afrikaans), Sengaparile, Kanako, Lekgagamare (Setswana), Mmonyane (Sepedi)

2. BACKGROUND

Devil's Claw is the most commonly used name for the plant *Harpagophytum*. Another common English name for Devil's Claw is Grapple Plant, because the form of the fruit resembles a hook which is designed to protect the plant against animals. Its botanical name is derived from the Greek "harpago" meaning "grappling hook." The nature of its name originates from the hooked, claw-like seed pods attached to the flowers. This genus is comprised of two species: *Harpagophytum procumbens* (with two subspecies, *procumbens* and *transvaalensis*) and *Harpagophytum zeyheri* (with three subspecies, *zeyheri*, *sublobatum* and *schiffii*). The two species occur in South Africa. Devil's claw belongs to the family *Pedaliaceae*.

Harpagophytum procumbens is a native Southern African plant, (Kalahari region, Namibia and Botswana) and is particularly found in the Northern Cape, North West and Limpopo provinces.

3. DESCRIPTION

Devil's Claw is a prostrate, mat-forming perennial herb, considered as a weed. It is a herbaceous plant that can grow up to 1,5 m in length.

Stem

The plant has creeping annual stems of up to 2 m long, spreading from a tuberous fleshy rootstock. They have many hollow branches and are covered with glandular hairs which exude a slimy, sticky sap.

Roots

Devil's Claw has a strong central taproot and secondary root tubers (storage roots) branching out horizontally. These roots can grow up to 50 cm in length and up to 2 m deep and the secondary storage roots are up to 25 cm long and 6 cm deep. The plant can store up to 90% water in these storage roots. It is these storage roots which are used medicinally. It has secondary roots, called tubers which grow out of the main roots. Its tubers grow off its taproot and are shaped like elongated sweet potatoes. Although the name comes from the fruit, the part of the plant used for its medicinal value is the tuber.

Leaves

The weedy plant has grey or green leaves. The leaves are large and heart-shaped. The opposite leaves of Devil's Claw are blue-greyish-green and irregularly divided into several lobes.

Flowers

Flowers and leaves can only be found during the rainy season. The tubular flowers are dark violet with a yellow and white throat. The plants flower mainly from around November to April (summer).

Fruit

From the flowers grow woody, sharply curved, sticky, barbed fruit, which give Devil's Claw its name. The characteristic fruit have numerous long arms with sharp, hooked thorns, as well as two straight thorns on the upper surface. The fruit looks like a giant claw.



4. CLIMATIC REQUIREMENTS

Devil's claw grows well in temperatures of between 17 and 30° C. The plants can withstand slight frost.

5. SOIL REQUIREMENTS

The Devil's Claw is most abundant in the veld (grasslands) of the Transvaal region in South Africa. The type of habitats where the Devil's Claw thrives best is in well-drained deep, red, light sandy rocky soils; it seems to prefer the soils along roadsides and grows well in waste grounds. Optimum soil temperatures needed for germination vary depending on species.

6. CULTURAL PRACTICE

Soil preparation

Planting of Devil's Claw seed requires loosening of the top quarter of soil with a rake, clearing all other vegetation on the ground in a 3-m wide strip. When the soil is too compacted, preparation for planting by digging and turning the soil to a depth of approximately 8 cm is required. After preparation of the soil, the bed should be leveled with a rake to create an even surface on which to sow the seeds.

Propagation

The plant is propagated from seeds or planted secondary tubers.

Planting

Devil's Claw can be planted in late spring or early summer. The seeds should be scattered evenly over the prepared beds or should be sown in a furrow of 20 cm deep and 60 cm wide. After

sowing, the seeds can be raked up slightly and covered with a thin layer of soil. Seed planted too deeply can cause poor germination. The small tubers should be planted 10 cm deep and 50 cm apart. The young primary tubers are planted in carefully prepared strips of land using an organic protocol, both to ensure top quality plants and to minimise impact on the natural environment. Growing wild, the complicated desert plant needs to grow for four years or more before it is ready for harvesting.

Irrigation

The seeds should be irrigated daily with a fine mist sprayer, keeping the bed evenly moist until the seedlings emerge. After emergence, irrigation should be applied every second day, keeping a careful watch over the small plants and not allowing these to dry out. As temperatures drop, the frequency can be extended. Frequency of irrigation depends on the temperature and soil. Once the plants are showing four to five leaves and are well established, further irrigation once or twice a week will be sufficient. For maximum seed production, continue irrigation until the flowers stop blooming.

Fertilisation

A lime fertiliser or compost is needed. Five to seven centimetres of organic matter should be added to the soil. Organic matter provides food for the plants and microorganisms living in the soil, and it also provides essential nutrients and micronutrients to plants.

Pest control

There are no major pests and diseases affecting the devil's claw, however, very rarely it is disturbed by aphids and powdery mildew.

The only pests of concern are animals feeding on the tubers, e.g. porcupines and antelope such as duiker and steenbok. Birds are attracted to the freshly seeded wildflower beds. In areas that are small (i.e. the beds) bird netting can be used and a mulch of dried leaves or shredded palm fronds can be spread over the bed. The mulch should be removed immediately once the seedlings appear.

Disease control

Over-watering could lead to fungus problems. Registered fungicides can be used.

Harvesting maturity

Devil's Claw takes three to four years to reach maturity and the matured plant is very hardy. Harvesting takes place during the rainy season, from November to June/July each year and usually stops at the end of July, but not earlier than the end of June, unless there is hard frost. The rainy season is thought to be preferable because the plants are most easily identified during this time and the soil is softer, which makes the digging up of the secondary tubers easier than in the dry season. The best time to harvest is in the autumn, when the seed pods are ripe and after the fruit weed