

Cultivation Protocol For

Carum carvi



Family: Apiaceae (Umbelliferae)

Local/common names: Caraway seed, Carum, Kumblik, Jeera, Karpo, Koniet (Jammu and Kashmir), Khonyot (Spiti, Himachal Pradesh), Shingu (Lahaul, Himachal Pradesh), Shia jeera (Kinnaur, Himachal Pradesh), Shahi Jeera/shingu jeera (Uttaranchal), Mawo, Dru (Himachal Pradesh.).

Status: Not Evaluated (IUCN)

Distribution and habitat: The plant is native to Europe and West Asia. It is commonly found in moist meadows, arable land and wastelands from lowlands to mountains. In India the species is available in the wild in the high altitude regions of Jammu and Kashmir (Ladakh, Zaskar, Lungna) Himachal Pradesh (Kinnaur, Lahaul and Spiti and Pangi-Bharmour) and Uttaranchal. The species is now under large scale cultivation in Europe and Morocco in Africa. In India it is cultivated in Bihar, Orissa, Punjab, West Bengal, Andhra Pradesh and in the hills of Kumaon, Garhwal (Uttaranchal) and a few cool dry regions of Kashmir.

Environment of growth: Caraway grows well in a variety of soils and tolerates a pH in the range 4.8-7.6. However, sandy loam soil rich in organic matter is preferred for cultivation. It is a sun loving plant although it can grow in semi-shade too. Caraway can also tolerate light frost.

Part used: The dried ripe fruits are used mainly. The leaves and roots are also utilised.

Market rate : Seeds of caraway is sold in the market at Rs. 250-Rs. 750 per kg depending upon the quality. International prices of essential oil of caraway vary from Rs. 2,000-2,500 per kg.

Agro-technology:

- **Collection of seeds:** The seeds are collected when the oldest fruits turn brown. Thereafter they are dried, stored in paper bags or air-tight containers and kept in a dark cool place.
- **Seed treatment and germination:** As much as 60-90% seeds are found viable after harvesting and viability decreases after 6 months. In the natural habitat, the seeds do not germinate just after fruit dehiscence although they disperse and fall on the ground. After melting of snow in February-March the seeds germinate and attain a height of 2 cm within two weeks. In soil, germination has been recorded within 15-30 days after sowing while in polybags 60% germination has been recorded.
- **Land preparation and soil work:** The plant prefers plain land for growth. The selected land is ploughed at least once after which well decomposed farm yard manure (FYM) is mixed with soil. For an area of 2 x 1 m, 5 kg FYM is mixed well with the soil. Between every two beds a distance of at least 12 cm is maintained for drainage of water. The height of each bed is kept 6 inches above the ground. Manuring is carried out just before sowing with 50-60 kg/ha nitrogen, 90-100 kg/ha phosphorous and 80-90 kg/ha of potassium. Compost prepared from leaves, grass clippings, straw and non-woody plant trimmings can be prepared to use as manure for the plants like caraway.
- **Nursery preparation:** Caraway does best when the seeds are sown as soon as they ripen in autumn, though they may be sown in March too. The seeds can be sown in drills, 12 cm apart and when the plants are strong enough thinning should be done to about 6-8 inches in the rows. In the polyhouse, seeds are first sown in polybags filled with well prepared soil. The seeds are sown 2.5 cm deep

and spacing between seedlings should be maintained between 30-60 cm.

- **Transplanting:** Caraway plants strongly resent root disturbance and thus transplanting is not advised. If carried out, it is preferable to take utmost care in transplanting the same from the nursery to the field when they attain a height of 8-10 cm.
- **Vegetative propagation:** Though the plant is raised mostly from seeds mature bulbs are also used for propagation.
- **Water management:** The field is irrigated immediately after sowing if there is no rain. In the initial month irrigation should be done at an interval of 3-4 days after which watering once in a week is sufficient. Irrigation is required during April-July in both the first and second year prior to rainfall as the moisture content becomes very low.
- **Weed and pest control:** The ground requires occasional hoeing and weeding to keep it free of debris and plant growth. Weeding should be done atleast twice before the plant are full grown. As the plant gains height less weeds survive under the shed of the *Carum* canopy. The flowers attract parasitic wasps that prey on aphids and help reducing insect-pest population.
- **Maturity and harvesting:** The seeds ripen in August and are collected when the oldest fruits turn brown. Thereafter, they are dried, stored in a paper bag or airtight container and kept in a dark cool place.
- **Post harvesting techniques:** When the fruit ripens, the plant is cut and the seeds are separated by threshing. The plants are spread out in loose bundles to dry in the sun for 4-5 days. The dried fruits are then threshed and cleared by winnowing. The seeds are then stored in paper bags or closed containers. Further processing is done via steam distillation of the dried seeds immediately after crushing. One kg of seeds yields 42 g of essential oil. Average seed yield is 1.25 tonnes per ha but it may vary from 0.75-2.0 tonnes depending on the agro-climatic situations.