

Wild Carrot (*Daucus carota* L.)

Family: Umbelliferae (Apiaceae)

November 1999

Description and Variation: *Daucus carota* is an erect, taprooted herb, 1 to 4 feet tall. Although it can occur as an annual or short-lived perennial, the species is typically a biennial that bears a rosette of leaves its first season (Dale 1974). The plant, which is covered with coarse, stiff hairs, has fern-like leaves that are divided several times into small, toothed leaflets; the ultimate segments are linear or lance-shaped. Leaves are basal or alternate. Basal leaves have a long petiole. Stem leaves are sessile with sheathing bases. The small, white flowers are borne in compound, flat-topped umbels. Umbels are 2 to 4 inches in diameter and may have 1 to several purple or pinkish flowers at the center (Hitchcock et al. 1961; Anonymous 1981). Umbels, which are surrounded by a circle of finely divided bracts, become concave as the fruits mature. A single plant may produce up to 100 umbels during the flowering season (Dale 1974). The oblong, grayish-brown fruits are 1/8 to 1/16 inch long and flat on one side. The other side of the fruit has rows of bristles on the curved surface (Anonymous 1981).



The genus *Daucus* consists of about 22 annual and biennial herbs with finely divided leaves and white or yellow flowers (Mitich 1996). Only one species is native to the United States (Hitchcock et al. 1961)

Economic Importance:

Beneficial: Wild carrot flowers are aesthetically pleasing and are sometimes sold as ornamentals, particularly in wildflower mixes. The digestibility and nutritive value of the vegetation is similar to legumes; sheep, cattle, and horses will graze on it. In addition, the adult of a parasite of the European pine shoot moth feeds of the flower of wild carrot (Dale 1974).

Detrimental: Wild carrot invades open ground and competes with native grasses and forbs for resources. The plant poses a threat to recovering grasslands, since it matures faster and grows larger than many native plants (Eckardt 1987). The species germinates readily after fires and can be particularly persistent in soils with high clay content (Eckhardt 1987). Wild carrot also affects commercial carrot

production. Wild carrot and commercial carrot are the same species. Wild carrot harbors pests that are common to both. In addition, it can cause poor seed production of commercial varieties through hybridization (Frankton 1955 cited in Dale 1974). Wild carrot can cause problems in hay, particularly the second cutting (Fitzsimmons and Burrill 1993). Wild carrot will taint milk if dairy cows consume a large amount of the plant material (Dale 1974). Some information from Europe suggests wild carrot may be mildly toxic to cattle and horses (Kingsbury 1964).

Geographical Distribution: A Eurasian native, *Daucus carota* is found from Norway and central Sweden to North Africa and the Canary Islands and east through Siberia to northern and eastern India. It is also found throughout the United Kingdom, particularly in coastal areas (Dale 1974). It has been introduced to the northern U.S., where it occurs from Vermont to Virginia, and west to Washington, Oregon, and California (Eckhardt 1987). In addition, wild carrot occurs in Canada, Mexico, Central America, and the West Indies (Dale 1974). In Washington, the plant is abundant west of the Cascade Mountains, and is locally established on the eastside (Fitzsimmons and Burrill 1993).

Habitat: Wild carrot occurs in meadows, pastures, roadsides, and waste places. Plants are typically found in sandy or gravelly soils and in wet areas (Fitzsimmons and Burrill 1999). In eastern Canada and Britain, the plant is associated with calcareous soils, but it is not limited to them. The plant usually grows in open areas. In shady areas, the plant is less vigorous and may be a short-lived perennial (Dale 1974).

Wild carrot needs more than 120 consecutive frost-free days. It is also limited by altitude. The plant occurs from sea level up to 1500 feet. However, it is not limited by photoperiod. The plant survives in Central America, where day-length is relatively constant, as well as at 65° N in Sweden, where there are 24 hours of daylight in June (Dale 1974).

History: Greeks and Romans used wild carrot as a medicinal plant. The plant has a variety of uses, ranging from an anti-venom to a love potion (Mitich 1996). The plant was probably brought to America by early settlers as a medicinal plant (Mitich 1996). The species has been documented in the U.S. since the 18th century (Dale 1974). It is believed that our modern cultivated carrot is a cross between wild carrot and giant carrot (*Daucus maximus*), which is found in the Mediterranean region. The fleshy yellow/red root of the commercial carrot was a new characteristic; wild carrot has a thin, whitish, woody taproot (Schuchert 1999).

Growth and Development: Wild carrot is typically a biennial herb, although it can behave as an annual or short-lived perennial. The plant reproduces entirely by seed. Plants overwinter as seeds or rosettes. Germination follows rain, mostly in the spring; however, germination also occurs in the summer and the fall. Flowering may occur within 6 weeks of germination. Flowering peaks in July and continues until a hard frost. All plants die once they bloom (Dale 1974).

Reproduction: Although plants are self-fertile, wild carrot flowers are typically cross-pollinated by a wide range of insects. The anthers mature earlier than the

female flower parts; the pistils are only weakly developed when the pollen is shed. Estimates of seed production vary, from 1000 to 40,000 seeds per plant (Dale 1974). In Oregon's Willamette Valley, one study estimated that 44 seeds were produced per cm² of vegetative cover (Lantz 1997). Other studies indicate that seed production is influenced by latitude. Lacey (1984) found that plants from North Carolina produced fewer viable seeds than plants from Michigan and Ontario. Seeds of the terminal umbel ripen first; these umbels are heaviest and have more viable seed. The seeds are released from mid-summer through mid-winter and may be carried by wind or on animal fur. The seeds can also pass undigested through a horse (Dale 1974). Wild carrot seedlings can establish on a broad range of cover types (Gross and Werner 1982). Lantz (1997) found that seedlings established equally well in intact vegetation and disturbed areas.

Response to Mechanical Control Methods: Hand-pulling or mowing during the first year when the plants are 7 to 10 inches tall can be effective (Eckhardt 1987). Where possible, plowing and planting a cultivated crop for 2 years may decrease infestations. Frequent cultivation promotes seed germination, which depletes the soil seed bank and destroys seedlings before they can mature and reproduce (Muenscher 1980).

Response to Cultural Control Methods: Populations are often maintained by disturbance (Dale 1974). Abundance of wild carrot on certain soils decreases with the establishment of native vegetation (Eckhardt 1987). Therefore, establishing and maintaining healthy stands of native/desirable vegetation can reduce wild carrot infestations.

Response to Herbicides: Herbicides are most effective when applied to seedlings. Older plants may not respond to herbicides. Annual applications may be required to control seedlings. Selective herbicides are available to control wild carrot in grass and clover plantings (Fitzsimmons and Burrill 1993). For specific herbicide recommendations, refer to the *Pacific Northwest Weed Control Handbook*.

Biocontrol Potentials: Since wild carrot and commercial carrot are the same species, classical biological control is not a viable option.

References:

- *Anonymous. 1981. Weeds of the North Central States. North Central Regional Research Publication No. 281. University of Illinois Urbana-Champaign, Urbana, IL.
- *Berenbaum, M. 1981. Patterns of furanocoumarin distribution and insect herbivory in the Umbelliferae: Plant chemistry and community structure. *Ecology* 62:1254-1266.
- *Dale, H.M. 1974. The biology of Canadian weeds. 5. *Daucus carota*. *Canadian Journal of Plant Science* 54:673-685.