

## Field bindweed

### *Convolvulus arvensis* L.

Synonyms: *Convolvulus amiqens* House, *C. incanus* auct.non Vahl, *Strophocaulos arvensis* (L.) Small

Other common names: creeping jenny, European bindweed, morningglory, perennial morningglory, smallflowered morning glory

Family: Convolvulaceae

#### Description

Field bindweed is perennial plant with extensive and deeply descending rhizomes that can penetrate the soil to a depth of 20 feet (Whitson et al. 2000).

Glabrous to densely pubescent stems are trailing to somewhat twining and can be more than 23 feet long. Leaves are long-stalked,  $\frac{3}{4}$  to  $2\frac{1}{2}$  inches long and about 1 inch wide, with a rounded tip and smooth margins. The leaf shape of this species is extremely variable. Most leaves are arrowhead to triangular shaped; however round, ovate, oblong, or linear shaped leaves are also found. White or pinkish-purple funnel-shaped flowers,  $\frac{3}{4}$  to 1 inch across, appear singly, sometimes 2 or 3 in the axils of leaves.

Flowers last a single day only. The fruit is an egg-shaped capsule housing grayish-brown, three-sided seeds (Hitchcock et al. 1959, Royer and Dickinson 1999). Seedlings are erect and ascending with seed leaves nearly as broad as long, somewhat round, and notched at the tip (Lyons 1998).



Photo by B. Eugene Wofford, Tennessee Vascular Plants Atlas

Field bindweed may be confused with black bindweed (*Polygonum convolvulus* L.), which has clusters of inconspicuous, greenish-white flowers, leaves with pointed tips, and a membranous or papery sheath at each leaf node (Royer and Dickinson 1999, Weaver and Riley 1982).



Photo by Thomas Heutte, USDA Forest Service

#### Ecological Impact

*Impact on community composition, structure, and interactions:* Field bindweed can twine and form dense tangled mats, which can dominate the local plant community. Its extensive root system reduces the availability of soil moisture and nutrients thereby outcompeting native forbs and grasses. This plant attracts various pollinators including bees, honeybees, butterflies, and moths (Zouhar 2004). It may be mildly toxic to some grazing animals (Lyons 1998, Todd et al. 1995). Field bindweed hosts several viruses (Weaver and Riley 1982).

*Impact on ecosystem process:* Field bindweed tends to occupy bare ground under open conditions. It is unclear how long this species may persist in native plant communities, but it can affect successional processes (Rutledge and McLendon 1996).

#### Biology and Invasive Potential

*Reproductive potential:* Field bindweed reproduces by seed and rhizome. The number of seeds per plant varies between 12 and 500 (Royer and Dickinson 1999, Weaver and Riley 1982). The seed bank of field bindweed is extremely persistent. Seeds may lie dormant in the soil for more than 50 years (Lyons 1998, Timmons 1949, Whitson et al. 2000).

*Role of disturbance in establishment:* Field bindweed is an early successional species that establishes easily on bare ground or in disturbed natural communities;

germination is better on bare ground than on sites with litter or vegetation (Zouhar 2004).

*Potential for long-distance dispersal:* Seeds fall near the parent plant but can be dispersed farther by water, birds, or animals (Harmon and Keim 1934, Proctor 1968, Weaver and Riley 1982, Zouhar 2004).

*Potential to be spread by human activity:* Seeds can be dispersed by vehicles and machinery or in contaminated farm and garden seed. Field bindweed is planted as an ornamental ground cover and in hanging baskets (Zouhar 2004).

*Germination requirements:* Peak germination occurs in late spring or early summer. Under laboratory conditions the optimal temperatures for germination of field bindweed ranged from 68°F to 95°F. Seed coats may become permeable to water by exposure to moist air or fluctuating soil temperatures, by mechanical abrasion especially during cultivation, or by passage through the digestive tract of mammals and birds (Weaver and Riley 1982).

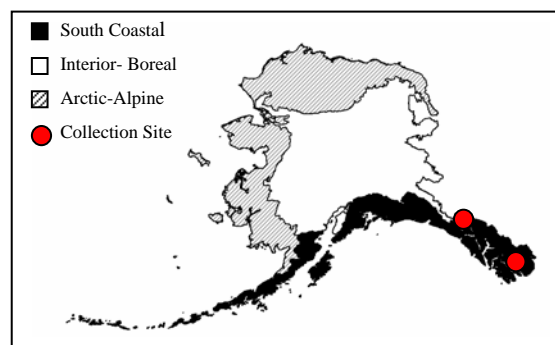
*Growth requirements:* The optimal growth conditions for field bindweed are strong sunlight and moderate to low moisture. This plant grows best on rich, fertile soils but may persist on poor, gravelly soils (Rutledge and McLendon 1996). Field bindweed is cold tolerant. Freezing temperatures kill shoots, but roots and rhizomes can withstand temperatures as low as 21°F (Dexter 1937).

*Congeneric weeds:* No other weedy *Convolvulus* species are known (USDA 2002).

*Listing:* Field bindweed is declared a Federal Noxious Weed in 35 American states and 5 Canadian provinces (Invaders Database System 2003) and is a prohibited noxious weed in Alaska (Alaska Administrative Code 1987). In many areas field bindweed is considered to be the worst agricultural weed (Hitchcock et al. 1959).

## Distribution and abundance

*Native and current distribution:* Field bindweed is native to Europe and Asia, but is now cosmopolitan between 60°N and 45°S latitudes, growing in temperate, tropical, and Mediterranean climates (Gubanov et al. 2004, Lyons 1998). This plant is common in the United States and Canada, except in the extreme Southeast, New Mexico, Arizona, Newfoundland and Prince Edward Island. It is especially common in cereal crops, orchards, and vineyards. It can be also found on ditchbanks and along roadsides, streambanks, and lakeshores (Lyons 1998). Field bindweed has been reported from Haines and Ketchikan in Southeast Alaska (AK Weed Database 2004).



## Management

Field bindweed is difficult to control due to its extensive root system and seed longevity. Mechanical control is not successful as plants are able to reproduce from roots. Herbicides are generally the most effective control. Currently, no biological control agents are available (Elmore and Cudney 2003, Rutledge and McLendon 1996).

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