

# Organic Noxious Weed Management

## **Field Bindweed, *Convolvulus arvensis***

### *Family Convolvulaceae*

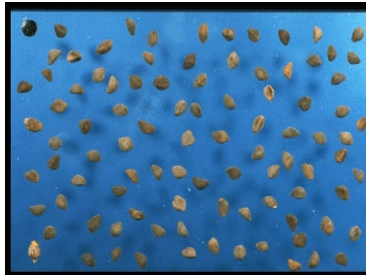
Sarah Doyle, Micaela Morgan, and Sandra K. McDonald, May 2005



**Also known as wild morningglory or creeping jenny, field bindweed is one of the ten worst noxious weeds in Colorado. This perennial is widely distributed and is prevalent in basic, high pH and heavy soils. It is an extremely competitive plant, commonly found in disturbed areas such as crop fields, prairie dog colonies, and building sites.**

Photo Credit  
1: A.P. Knight  
2: H.F. Schwartz  
3: P. Westra

Courtesy of CSU Ag Image Collection



**Field bindweed** is a hardy, drought tolerant weed. A rope-like, extensive and persistent root system radiates from a central taproot. A small percentage of lateral roots can survive the overwintering period and proliferate horizontally for several seasons. Prostrate stems grow to four feet long, forming thick mats or climbing taller plants and nearby fences to reach sunlight. Leaves vary in size and shape, depending on environmental conditions. An arrowhead shape with parallel sides is typical, with smooth or finely hairy dark green foliage. Flowering occurs from June to September. Trumpet-shaped pink, white or purple flowers are borne on extended shoots originating from leaves with two bracts.

Field bindweed produces seed approximately two weeks after pollination. Seed are variably shaped, with one rounded and two level sides. The tough seed coat is dull brown and rough. Plants may produce up to 300 seeds in favorable conditions. Seed germinate in fall and spring, when temperatures are conducive to quick growth. Field bindweed also produces vegetative offspring. Lateral roots develop rhizome buds that become new plant crowns at the soil surface. Existing crowns are killed in freezing weather, but large roots survive below-zero temperatures. Seeds are equally durable, and may remain viable for 40 years.

## **Control Methods**

**Mechanical:** Several seasons of conscientious cultivation are needed to provide visible control of field bindweed. Fall moldboard plowing exposes roots to desiccation and freezing reducing plant strands. Small seedling can be managed by cutting just below the soil. Continuous intervals of 10-14 days are generally used, be aware cultivation may also exacerbate field bindweed problems. Severed root segments can sprout vigorous root and crown systems. Machinery may carry plant parts to new sites. Grazing can also be an effective method of control. Sheep, cattle, goats, hogs, and chickens will eat the leaves, stems, and may expose roots and crowns. Black plastic mulch or fabric weed barrier will stifle bindweed in high-value plantings by keeping light from reaching the ground bindweed can push up through mulch, fabric, even pavement! It may take three to four years to kill the bindweed. Pulling, cutting, and hoeing are effective for small seedlings during the 1<sup>st</sup> season of growth.

**Biological:** The bindweed mite, *Aceria malherbae*, is a microscopic mite that feeds on field bindweed and closely related wild native morningglories. It does not damage other plant families. Bindweed mite feeding causes the formation of gall-like growth of plant leaves, characterized by leaves folding around any enlarged mid-rib vein and deformed, stunted leaves and vine growth. Leaves of infested plants are thickened and have a “fuzzy” texture. Advanced stages of infestation with severe mite damage appears stubby and highly deformed

Bindweed mites have the potential to aid in suppression or control of field bindweed in arid regions. The best results will be obtained with active management of the mite population, especially by mowing of the bindweed which moves the mites around and stimulates new growth for the mites to feed on. Bindweed mites survive better in drier settings and will be less effective in tall grass stands. At present, the mites are widely established throughout the lower elevation areas of Colorado.

Bindweed mites spend the winter on underground buds on bindweed rhizomes. They have successfully overwintered in Canada and Montana. Excessive moisture appears to be the environmental factor that limits their establishment. Mites migrate to underground buds during drought when plant tops die down.

Success in managing field bindweed with mites is highly dependent on your expectations. If you expect the bindweed to disappear shortly after releasing the mites, you will be disappointed. The initial impact will be a reduction of growth and limited flowering and seed production of infested plants. It will take a year or more for infested plants to die. Control of bindweed over a large area can take years: Be patient, mow, move mites manually, and you will increase your chances of success.

Many of the biological control agents are available for free or at a small cost. Contact the Palisade Insectary at 970-464-7916 or if a Colorado resident you can call toll-free at 1-866-324-2963 to get specific details on availability.

**Cultural Practice:** Perennial plantings may discourage seed germination and seedling growth. Rotations of tall, shade-producing crops can reduce bindweed problems, since the weed is not very competitive under shady conditions. Healthy, long term stands of sod forming grasses or dense plantings of bunch grasses and legumes (in irrigated scenarios for 2 or more years) can function as “smother crops.”

In field crop production, flame weeding causes the cell sap to expand and disrupt cell walls. Weeds are most susceptible to lethal flaming when they are 1-2" tall. After a seedbed is planted, yet prior to crop emergence, repeated flaming can be useful to suppress Field Bindweed.

The use of thermal (steam) weed control systems can be used as an alternative method from mechanical cultivation. Weeds are steamed using two trailer mounted Atarus Stinger Streamer generators that heat steam up to 800 degrees F.

**Organic Herbicides:** There are two products with acetic acid that are effective over many years and are registered in Colorado. These are AllDown and BurnOut II. AllDown Green Chemistry Herbicide Organic Weed & Grass Killer is a non-selective herbicide manufactured by KPT, LLC dba, Summerset Products, that contains high concentrations of vinegar, garlic, and other organic ingredients. BurnOut II is a non-selective herbicide manufactured by St. Gabriel Laboratories, that contains acetic acid and other organic ingredients. These products provide non-translocating, burndown action (May not kill whole plant. Implies plant can re-grow). Extra precautions may be needed when using vinegar. Read label carefully.

### **Successes & Failures in Control Methods**

#### **Successes:**

*“Fall control is essential in the prevention of bindweed.”* **Bob Hammon**

*“When dealing with creeping perennials and tillage, sweeping plows would be a better tillage choice than using a disk. When disking, root segments are “chopped up” and can actually increase populations if adequate moisture exists.”* **Wayne Cooley**

*“For hand weeding (pulling), a recommended practice would be to pull the weeds when the soil is wet (if possible). This will allow for obtaining a greater portion of the root system and require more use of carbohydrates to grow a new plant. When the soil is dry, the roots break at soil level.”* **Wayne Cooley**

*“Mechanical strategies aim to exhaust carbohydrate stores in the deep, extensive root system. Any persistent strategy that curtails photosynthesis while preventing vegetative distribution of bindweed will exhaust the plant stands over several years.”* **Adrian Card**

*“Steam gives good control for field bindweed. Multiple applications are needed to provide season long management of weeds.”* **Thaddeus Gourd**

**Failures:**

*“Rotary tillage (walk behind, tractor, and driven rototillers) distribute vegetative pieces of bindweed like disks, which should be avoided. Moldboard plowing (breaking plow, turning plow, etc.) in the fall has shown to stress bindweed stands and diminish the vigor of spring regrowth.”* **Adrian Card**

*“Rototilling is more likely to propagate a control bindweed. Avoid overgrazing pastures. Bindweed commonly becomes dominant weed.”* **Adriane Elliott**

*“When the mites work, they work great, but it can not be guaranteed to work in every case.”* **Bob Hammon**

*“Bindweed may be more resistant to the use of AllDown and vinegar products.”*  
**Thaddeus Gourd**

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Data for and review of this factsheet were given by growers, researchers and extension experts.