

Managing Field Bindweed with the Bindweed Mite

Field bindweed (*Convolvulus arvensis*) is one of the most widespread and difficult to manage weeds growing throughout the United States. The vining plant produces an extensive root system that stores enough nutrients to fuel extensive growth. The plant thrives in the arid western states and will grow on many sites where other plants cannot exist. Control with herbicides is difficult. Bindweed can be successfully managed on some sites with fall applications of glyphosate containing herbicides. Control in localities with desirable vegetation, inaccessible areas, as well as many agricultural systems is nearly impossible with herbicides.

The bindweed mite, *Aceria malherbae*, is a microscopic eriophyid mite imported from southern Europe as a biological control agent for field bindweed. The bindweed mite feeds only on field bindweed and closely related wild morning glories. It does not damage other



Figure 2. Damage symptoms of heavily infested bindweed plant. Growth can be distorted to the point that the plants no longer resemble field bindweed.

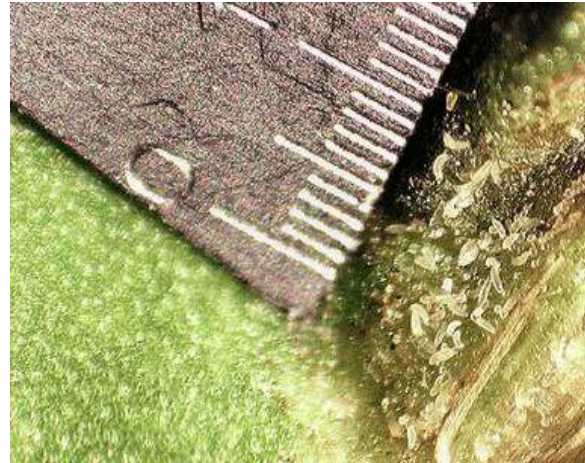


Figure 1. Bindweed mites are about 0.1mm in length. They cannot be seen with the unaided eye.

plant species, and it requires bindweed to survive. Bindweed mite feeding causes the formation of gall-like growth of plant leaves. Leaves of infested plants become thickened, and have a “fuzzy” texture. In heavily infested plants, the shoots are misshapen and growth is severely stunted. Newly emerged leaves on recently infested plants appear folded with thickened midribs. The thickened texture and fuzzy appearance are good diagnostic characteristics to identify bindweed mite presence.

Bindweed mites have the potential to aid in suppression or control of field bindweed in many arid regions, and under many plant management regimes. It can be useful in wildland settings, pastures, roadsides, disturbed areas, landscape plantings, and other areas. The best results will be obtained with active management by mowing the bindweed, which moves the mites around and stimulates



Figure 3. Recently infested bindweed leaves have a thickened, reddish midrib with a fuzzy texture. More heavily damaged leaves have crumpled distortion of growth.

new growth for the mites to feed on. Bindweed mites survive better in drier settings. Their impact in sprinkler irrigated settings, especially lawns, will probably be less than in non-irrigated sites.

Bindweed mites spend the winter on the underground buds of bindweed rhizomes. The protected overwintering site allows them to survive extreme winter conditions, and they have successfully overwintered in the harsh environments of Canada and Montana. Excessive moisture appears to be one of the environmental factors that limits its establishment. Attempts at establishing them have not been successful in areas with significant rainfall and high humidity. Bindweed mites can survive extended drought periods by actively moving to underground buds when plant tops die down. Initial establishment of bindweed mites has been most successful on the drier sites, as long as the bindweed is actively growing when the release is made.

Bindweed mites are available from collections of infested plant material. Several mite nursery sites have been established in western Colorado, and distribution of bindweed mites is coordinated by Tri River Cooperative

Extension and the Colorado Department of Agriculture in Palisade. It is best to release mites in the cooler part of the day to maximize their survival. The infested plants should be placed in direct contact with the bindweed that is to be infested. It should be either tucked under the plants or twisted up with the bindweed vines to keep it in place and from blowing away. Newly infested galls (folded leaves) should be apparent within a week or so after spring releases. In many cases, establishment may take a full growing season. Do not disturb the release site for a few weeks, then mow the area (if feasible) to distribute the mites and stimulate new bindweed growth. When galls are easily found, they can be harvested and spread to new areas.

Success in managing field bindweed with bindweed mites is highly dependent on your expectations and long-term commitment. 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 in 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.



Figure 4. Nearly 100% of the bindweed on this site near Grand Junction is infested with the bindweed mite. A new weed management challenge appears when other weeds move in as bindweed disappears from the system.