



Botanical Name (Scientific Name)

Kochia scoparia or *Bassia scoparia*

Points to Consider

- Annual kochia develops resistance to herbicides faster than average weeds. It is important to rotate through multiple methods of control.
- Control options are limited as plants mature later in the year. Early control is crucial, but problems usually go unnoticed until plants are mature.

Integrated Pest Management of Annual Kochia

Importance

Annual kochia significantly impacts agricultural lands across North America because of its high reproduction rate and ability to develop resistance to herbicides. It thrives in disturbed environments such as construction sites, gardens, tilled farm and fallow ground, and abandoned corrals. In rare conditions, usually when annual kochia becomes drought stressed, it can cause oxalate and nitrate poisoning in cattle. It is important to understand the symptoms of both conditions and to monitor livestock regularly when they have access to annual kochia. Do not confuse the plant with perennial forage kochia (*Bassia prostrata*), which is considered a valuable feed for livestock.

Description, Biology, and Ecology

Annual kochia (*Kochia scoparia* or *Bassia scoparia*) came from Eurasia and was introduced into the United States in the 1800s, most likely as an ornamental and forage plant. Some annual kochia cultivars have ornamental value, but the species that has spread throughout the West has little value.

Annual kochia is a summer annual that germinates in the spring when soil temperatures exceed 40°F. Early seedlings can be identified by the pubescence on its leaves. As the plant matures, newer leaves elongate and stems, leaves, flowers, and seed heads vary in color from green to red.

Annual kochia only reproduces by seed, so eliminating seed production is critical for control. Plants are often mature by midsummer with viable seed. One plant can produce up to 30,000 seeds per year. In late summer and early fall, the plant desiccates and drops seeds. Very few seeds remain viable after three years in field conditions.

Mature plants can vary between one and seven feet tall. They usually have a very broadly pyramidal growth habit with one central growing point and many branches, enabling the desiccated plant to blow across the landscape as a tumbleweed, spreading seed as it tumbles. Often these tumbleweeds are stopped by barriers such as fences and ditches.

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Management

Primary Management Tactics

Controlling kochia is best managed by using a variety of management strategies. Indeed, herbicide use alone quickly encourages the development of herbicide resistance. The use of mechanical and cultural practices provide better success.

Prevention

- Regularly clean fence lines and ditches and treat seedlings every year to prevent plants from producing seeds.
- Clean off mud or seeds from equipment after working in fields that have been known to have large seedbank reserves of annual kochia.

Mechanical

- Annual kochia is very susceptible to mechanical management during early growth stages. Till while it is less than 4 inches tall.
- Because annual kochia germinates through the summer, multiple tillage passes may be required throughout the year to obtain optimum control.
- Although mowing reduces seed production, annual kochia produces seed under mower heights.
- Flame weeding kills young plants. There is no need to blacken the plant or to physically set it on fire. Simply raise the temperature enough to disrupt its cell membranes. Damaged tissue will change color. Flame weeding is most effective when plants are less than two inches tall and the stems are supple.

Cultural

- Annual kochia does not do well with competition or in a properly maintained perennial system such as pasture or alfalfa. Avoid tilling soil in systems that do not need to be tilled.
- Grazing can have a dramatic effect on young kochia, but caution must be taken to prevent oxalate and nitrate poisoning.

Biological

Kochia is eaten by herbivores of all sizes but does not have a specific biological management option.



Figure 1. Annual kochia plants. Courtesy of Leslie J. Mehrhoff, University of Connecticut, Bugwood.org.



Figure 2. Annual kochia flowers. Courtesy of Leslie J. Mehrhoff, University of Connecticut, Bugwood.org.



Figure 3. Annual kochia seedlings. Courtesy of Bruce Ackley, The Ohio State University, Bugwood.org.



Figure 4. Annual kochia along roadway. Courtesy of Leslie J. Mehrhoff, University of Connecticut, Bugwood.org.

Chemical

- Populations of kochia in Idaho have been found to be resistant to several herbicide families — ALS inhibitors (imidazolinone, sulfonyleurea, sulfonyleurea carbonyltriiazolinone, and triazolopyrimidine); EPSPS (glyphosate); and growth regulators (dicamba, 2,4-D, triclopyr, aminopyralid).
- Kochia is most susceptible when young, before flowering.
- Exercise caution when applying chemical controls, because kochia rapidly develops resistance to herbicides.
- Not all herbicides work in every situation, so always read and follow the herbicide label.
- For recommendations for herbicides to use in the management of annual kochia, see the [PNW Pest Management Handbooks website](#).

Caution: Read Pesticide Labels

Pesticide labels override other recommendations.

ALWAYS read and follow the instructions printed on the pesticide label. The pesticide recommendations in this UI webpage do not substitute for instructions on the label. Pesticide laws and labels change frequently and may have changed since this publication was written. Some pesticides may have been withdrawn or had certain uses prohibited. Use pesticides with care. Do not use a pesticide unless the specific plant, animal, or other application site is specifically listed on the label. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock.

Trade Names — To simplify information, trade names have been used. No endorsement of named products is intended nor is criticism implied of similar products not mentioned.

Groundwater — To protect groundwater, when there is a choice of pesticides, the applicator should use the product least likely to leach.