

# Kochia: Options for Control

**Kochia** (*Kochia scoparia*), a **class-B** non-designate noxious weed in Franklin County, Wash. also known as burning bush, fireweed, mock or summer cypress, is of the Goosefoot family. Native to southern and eastern Russia, kochia was introduced into North America from Europe. It is an annual plant that reproduces from seeds only. The species typically produces around 14,600 seeds per plant. Seeds are dispersed in the fall when the plant becomes a tumbleweed. The plant tumbles with the wind, dropping seeds as it is



The seedlings grow vigorously, out-competing perennial species with their rapid growth.



The stems change to red as the plant ages and dies.



Flowers are inconspicuous



blown about. Laboratory studies report germination rates of 76 percent or better over a temperature range of 39-106 degrees F. Seeds buried in the soil have five percent viability after one



year and zero percent after two years.

Kochia gives itself a competitive advantage by producing chemicals that reduce the growth and germination of other more desirable plants, further reducing agricultural production. Additionally, kochia contains high levels of oxalates, alkaloids and nitrates that can be toxic to a variety of grazing animals if large amounts are consumed. Although kochia was deliberately introduced, it was declared an eradicable weed only two years later. The decision to attempt eradication of kochia was based on its behavior, including its very fast spread from the original plant, invasion of crops and pastures, its threat to agricultural production and, its potential to affect fire regimes and natural ecosystems.



A close-up of the dense spikes which are longer than the flower.



Kochia grows in a wide variety of soil types and is very drought tolerant and can spread rapidly in ideal conditions.



Kochia is a bushy plant with an erect main stem and numerous upwards-curving side branches.

## Key identifying traits

- Stems are erect, much-branched and leafy.
- Leaves are 1/2–2 in. long, alternated, narrow, lance-shaped with hairy margins & undersides.
- Stems are round, usually soft-hairy and often red-tinged and striped.
- Inconspicuous **flowers** form dense spikes in leaf axils, green in color.
- **Flowers** are usually surrounded by clusters of hairs, longer than the flowers.

## Biology and ecology

- Tap-rooted summer **annual**; reproduces by seed only.
- Seeds are generally **only viable for 1 or 2 years**.
- Flowering and seed production from July to October; **several flushes of seedlings per year**.
- **Extremely drought resistant**, but does well under irrigation.
- Kochia can accumulate **high nitrate** concentrations under certain conditions making it **toxic to livestock**.
- Widely scattered throughout Franklin County; primarily along roadsides in areas with a history of small-grain production and in **areas** that have been **disturbed**.
- Plants break off and roll as **tumbleweeds** when dead.



A roadside Kochia infestation in Franklin County. This healthy stand grew over 7 feet tall. One kochia plant typically produces 14,600 seeds.



A close-up of a Kochia seedling, notice the fine pubescent hairs.



This wheat farmer harvested around his patch of kochia.

## Control Measures

- **Biological:** None available. Since Kochia is like so many desirable plants, there never will be a bio-control.
- **Cultivation:** Tillage methods work well in controlling Kochia. Tillage should begin when the plant is less than 12 inches tall. Tillage will be required several times throughout the season because of new flushes of germination that occur during the season. Tillage before seed set on non-crop areas outside of a pivot will prevent harvest problems by wind blown plants tumbling into crop areas, greatly reducing spread of seed into the cropland.
- **Mowing:** Mowing or slashing the plants **before flowering** is effective in reducing the seed production, but it must be mowed **repeatedly**. Flail type mowers are preferred as they tend to break up the plant and deposit the debris in place, reducing the chance of spreading by wind.
- **Hand pulling:** Kochia grows rapidly spring through summer and sends down long taproots (up to 16 feet). Because of its annual growth pattern, hand pulling can be successful.

**Competition:** Seeding or improving the grass stand can improve competition against Kochia and reduce infestations, particularly in vacant areas and circle corners.

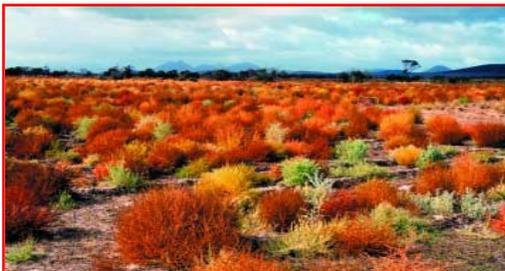
**Chemical:** Foliar applications should be made preferably when the plant is 6—12 inches or less in height or as directed by the label. Be aware that repeat treatments will need to be made unless the chemical has soil residual properties.

Herbicides effective in controlling Kochia include Glyphosate, 2,4-D, Vanquish (Dicamba) and Escalade 2 (2,4-D, Fluroxypyr, and Dicamba). Tank mixes of more than one herbicide can provide more complete control. Up to four treatments per year may be required to control multiple, delayed seed germinations. Kochia bio-types resistant to Dicamba, Glyphosate and 2,4-D have been discovered in the Pacific Northwest. The use of different herbicides with different modes of action will help prevent herbicide resistance. For more information, see PNW 437, Herbicide-Resistant Weeds.

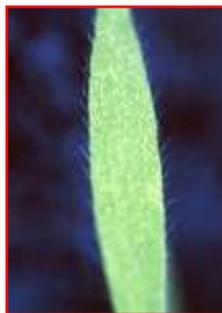
- **Always read the label instructions** before applying any herbicides. Use herbicides that are compatible with your goals.

## Herbicide Resistance

Kochia has shown resistance to two groups of herbicides, the sulfonylureas and triazines. This has been well documented in the U.S. and Canada. Herbicide resistance is one of the reasons why kochia was quickly targeted for eradication. **Rotating herbicides** would reduce the possibility of an increase in the proportion of plants tolerant to herbicides. Triazine resistant biotypes are more susceptible to 2,4-D ester than triazine susceptible biotypes.



Kochia plants die off in autumn and break off at the base by a brisk wind, it is then blown by wind as tumbleweeds. The tumbleweeds can spread the seeds up to several miles, much like Russian thistle.



Close-up of kochia leaf



Fences catch the tumbleweeds and can be sites of large infestations.

Photos and information courtesy of : Weed Management Guide, Natural Heritage Trust; Written Findings, WA State Noxious Weed Control Board, USDA Plants Database; PNW 437; and Texas Toxic Plants. A Big Thank you to the Lincoln County Noxious Weed Control Board for the use of their brochure.

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