Kochia: Options for Control

Kochia (*Kochia scoparia*), **a class-B** non-designate noxious weed in Lincoln 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 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 it's very fast spread from the original plant, invasion of crops and pastures, its threat to agricultural production and, it's potential to affect fire regimes and natural ecosystems.

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

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

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.

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

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

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 Lincoln 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.

Flowers are inconspicuous

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

A Kochia infestation in southern Lincoln County. This healthy stand grew up to 7 feet tall. One kochia plant typically produces 14,600 seeds.

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

This Lincoln County farmer harvested around his patch of kochia.

Control Measures

- **Biological:** None available. Since Kochia is so like so many desirable plants, there never will be a bio-control.
- **Cultivation: Early** tillage in the **spring** gives good control of kochia **seedlings**.
- **Mowing:** Mowing or slashing the plants **before flowering** is effective in reducing the seed production, but it must be mowed **repeatedly**.
- **Hand pulling:** Kochia grows rapidly spring through summer and sends down long taproots (up to 16 feet). Because of it's annual growth pattern, hand pulling can be successful.

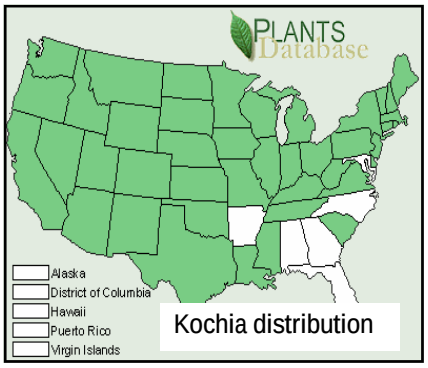
Chemical: Herbicides labeled for control are **Vista + 2,4-D + MSO surfactant, Weedmaster, Milestone, or Cimarron Max** for **non-croplands.** Each of these herbicides are **applied postemergence** to Kochia. Kochia biotypes resistant to Banvel (dicamba) have been discovered in Idaho. For more information, see PNW 437, Herbicide-Resistant Weeds.

- **Read** the **label instructions** before applying any herbicides.

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.

Close-up of kochia leaf



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 Jim Hill mustard or Russian thistle.

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

For this and other publications, see our website at: www.co.lincoln.wa.us/weedboard

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.

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