

Nutritious Treat for Cattle and Wildlife

Forage Kochia!



PEGGY GREB (D366-1)

An Angus cow enjoys a meal of grass and forage kochia on the Utah ranch of Bob Adams. Ranchers in Utah and Wyoming reduce feeding costs by grazing forage kochia during the fall and winter.



In the Western United States, a hardy plant called “forage kochia,” *Kochia prostrata*, greens up in spring, remains green and succulent during the heat of summer, and turns reddish in the fall. On snowy days, the leaves and stems make a satisfying snack for hungry cattle. Sheep, deer, elk, and antelope, as well, can nosh on this nourishing, shrublike plant.

Forage kochia (pronounced *KO-chuh*) can grow to between 1 and 2 feet high on western rangelands. In winter, it’s not unusual to see cattle deftly punching holes in the snowpack’s crust to reach the delectable kochia below. Now, if the plant were just a bit taller, poking out of the snow, the cattle wouldn’t have to perform this fancy hoofwork.

And a new, taller forage kochia for these and other rangeland grazers is exactly what ARS plant geneticist Blair L. Waldron has in mind. He and others are enthusiastic about forage kochia’s potential to offer an affordable source of much-needed, high-protein forage, especially during the harsh winter months.

Waldron, based at the ARS Forage and Range Research Laboratory in Logan, Utah, and Utah State University animal scientists collaborated in a recent study that provides new details about forage kochia’s ability to keep cattle—and ranchers’ balance sheets—in good health. For the study, a total of 84 pregnant Angus cows spent early November through late January either in corrals, where they were fed the traditional winter supplement, alfalfa hay; or in pasture planted, or seeded, with forage kochia and crested wheatgrass.

At the end of the study, two indicators of overall health—body condition and backfat—were within the desirable range for all animals. Though scores were lower for cows that grazed on seeded pasture, those cows were nonetheless in excellent condition for calving. And their feed costs were 25 percent less than those for their alfalfa-fed counterparts.

“Ranchers using the seeded pastures would have made a profit,” comments Dale R. ZoBell, Utah State University animal scientist. The study will be published in a forthcoming issue of *Rangeland Ecology and Management*.

New Look, Old Idea

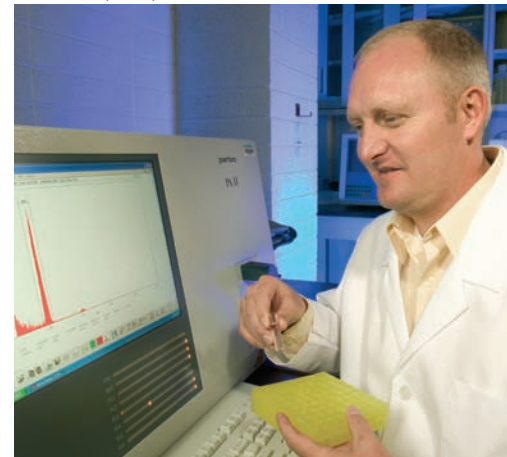
Planting forage kochia isn’t a new idea for the intermountain West—the region that extends from eastern Oregon and Washington through Nevada, Idaho, Utah, and Colorado south to northern Arizona and New Mexico. In fact, some *K. prostrata* stands date back 30 years or more. But the escalating cost of alfalfa hay has sparked new interest in forage kochia. Ranchers and researchers alike are eager to learn more about how to establish and maintain healthy stands on pastures and wildlands.

That’s part of Waldron’s job. So is exploring the globe for superior plants that could be used as parents for even better forage kochias for the American West.

Though a plant called “Immigrant”—the only kind of forage kochia sold in the United States today—is excellent, it generally grows no more than 2 feet high. Taller plants, like Eurasian specimens said to reach 5 feet, would be less likely to be buried by winter snowpacks.

K. prostrata is native to central Eurasian countries such as Russia, Kazakhstan, and Uzbekistan, where Waldron

PEGGY GREB (D370-1)



Using a flow cytometer, geneticist Blair Waldron analyzes the DNA content of new types of forage kochia from Kazakhstan and Uzbekistan.



Utah rancher Bob Adams (left) and Waldron discuss the nutritional quality of forage kochia and its grazing value during the fall and winter.

has journeyed on plant-collecting expeditions. He has brought back hundreds of superior specimens from these treks and is now testing them in greenhouse and outdoor experiments. Duplicates are safeguarded at ARS's official national collection of aridland plants in Parlier, California.

A Good-Guy Plant

K. prostrata is a distant relative of an annual weed, *K. scoparia*, that can be poisonous to cattle and sheep.

This annual kochia is popular with home gardeners who know it as "firebush" because of its red fall foliage. Fortunately, the annual weed and the promising perennial can't interbreed, according to ARS plant geneticist Richard R.-C. Wang at Logan.

Understandably, forage kochia is sometimes confused with the garden ornamental. "This mix-up sometimes makes it hard to convince people that forage kochia is really a good-guy plant," says Waldron.

But a good guy it certainly is. Forage kochia tolerates drought, flourishes on salty or alkaline soils that make life hard for many other plants, and survives with as little as 5 inches of rain or other precipitation a year. It also offers shelter and tasty seeds for upland songbirds and game birds such as sage grouse; helps control erosion; serves as a greenstrip or firebreak in fire-prone ecosystems; and seems to thrive on poor-quality sites that have been damaged by overgrazing, wildfire, or off-road vehicles.

ARS and university studies have yielded up-to-date, first-hand information about forage kochia's performance in ecosystems ranging from desert shrublands to high-mountain pinyon-juniper ranges. ARS plant physiologist N. Jerry Chatterton, research leader at the Logan lab; R. Deane Harrison, retired USDA Natural Resources Conservation Service range conservationist; and others collaborated in this quest for forage kochia knowledge.

Scientists evaluated the information on a detailed questionnaire filled out by 151 ranchers, extension specialists, and others with experience in managing kochia stands. Based on that data, the researchers chose 90 sites for a close-up analysis of forage kochia's role in an array of ecosystems.

At about half these sites, forage kochia had been seeded to revegetate land that had burned in wildfires, says Chatterton. At the other half, kochia had been the top pick because of its superior ability to restore damaged areas. Managers also chose kochia for its value as forage or for its ability to outcompete weeds such as cheatgrass and a poisonous plant called "halogeton."

"From these observations, we determined that forage kochia does not crowd out native perennials," Waldron notes. "It thrives in elevations from 1,600 to 7,000 feet and can actually grow better on inhospitable sites, such as dry areas with gravelly soils, than many other rangeland plants."

Their report, published in 2000, is the most up-to-date analysis of forage kochia plantings in the West. —By **Marcia Wood, ARS.**

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ARS agronomist Rob Smith (left) and retired NRCS range conservationist R. Deane Harrison measure new, taller forage kochia obtained from Uzbekistan. Taller plants are less likely to be buried by snow and thus more likely to be available all winter for grazing.