FORAGES FOR ALL SEASONS

Forage kochia - a forage with fall and winter grazing potential

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Forage kochia is adapted to regions of the Western United States with annual precipitation of 6 to 16 inches, can be grown on a wide range of soil textures, and is very tolerant of salinity.

Forage for winter grazing in Wyoming is usually in short supply and / or poor in nutrient content. Drought and other factors accentuate this shortage. Forage kochia (*Kochia prostrata*, not to be confused with the weedy *Kochia scoparius*) is adapted to regions of the Western United States with annual precipitation of 6 to 16 inches, can be grown on a wide range of soil textures, and is very tolerant of salinity. Forage kochia shows very little aggressiveness and no tendency to cross with weedy kochia. The appearance and growth habits of forage kochia are also different from those of weedy kochia. Forage kochia is a semi-evergreen half shrub, growing to a height of 1 to 3 feet. It develops a very deep tap root and an extensive fibrous root system. Individual plants can live for 10 to 15 years, and the plant readily reseeds.

Forage use

Most grazing observation on forage kochia has been in late fall and winter. This is the season when range and pasture forage is low in nutritive value. At the Archer Research & Extension Center, forage kochia was included among 16 improved forages in a test to evaluate winter forage availability and nutritive value after season-long stockpiling (Table 1). In 1998, a normal rainfall year (9.4 inches of spring-summer precipitation), forage kochia produced the greatest amount of forage among 16 entries (3035 pounds of dry matter per acre); in 1999, a wet year (16.0 inches of spring-summer precipitation), it produced 2220 pounds of dry matter per acre, about average among the

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Forage kochia is very drought tolerant, efficiently uses water and provides high-quality forage. Previous studies show that it has excellent potential for use as winter-grazed forage.

Forage production on the left (forage kochia) was >800 lb/acre; usable grass production on the right was 33 lb/acre in 2001.

16 forages; and in 2000, a dry year (5.5 inches from June through August), it produced 821 pounds per acre.

Forage quality

Forage kochia tested 7.7 percent crude protein on February 26, 1999, higher than the 12 perennial grasses and three legumes in the test at the Archer Research and Extension Center. Neutral detergent fiber (NDF), which is related to forage intake and acid detergent fiber (ADF), which is related to forage digestibility, were lower for forage kochia than for all other forages, indicating superior forage nutritive value during the winter.

Forage kochia was planted in a pure stand in this study, although it is generally planted in a mixture with grasses and other species. In its natural habitat it will comprise up to 20 percent of total production and can be cut for hay.

During the winter of 2000-01, 280 beef cows grazed kochia on the Broadbent Ranch in Uinta County. Approximately 1500 acres were cross-fenced to limit grazing to 200 to 300 acres. Carrying capacity was about 0.5 AUM per acre. Cows grazed from early January until mid-March, a period in which there were 10 inches of snow cover. A seed crop had been harvested the previous fall, leaving most of the kochia below the snow. Cows were given a high-energy grain supplement (13 percent protein) at 2 pounds per day during the coldest period. Cows improved about two points in body condition score during the kochia-grazing period and calved in late March and early April. Kochia near the end of the grazing pe-

riod still tested over 7 ½ percent crude protein. Although it appears unpalatable, cows readily eat forage kochia.

The ranch is located in an area receiving only 6 to 10 inches of precipitation. The summer of 2001 was very dry, with less than two inches of rainfall, yet the kochia produced 830 pounds per acre of forage dry matter. An adjacent sagebrush range produced 33 pounds per acre of usable grass.

Other uses

Forage kochia competes well with annual weeds such as downy brome, Russian thistle, and halogeton. It should be broadcast-planted on disturbed, dry areas for soil conservation. Since it maintains as much as 40 percent moisture in its stems, even in the winter, forage kochia has been used as a fire break.

Nitrates

Although nitrate accumulation has been observed in weedy kochia, nitrate accumulation has not been reported for forage kochia. Samples of forage kochia surviving a summer drought, taken in early November at the Archer Research and Extension Center, contained negligible levels of nitrates. Producers should always have samples of new or suspect forages analyzed for nitrate.

Table 1. Forage production, quality, and winter loss of stockpiled forages (Archer R&E).

Species	Crude protein		NDF[4]	ADF[4]	Forage avail. Nov. 5, 1998	Winter loss, Nov.-Feb.
	Nov. 5, 1998	Feb. 26, 1999				
	percent				pounds dry matter per acre	percent
'Immigrant' forage kochia	9.5	7.7	56.3	37.4	3035	40
Legumes[1]	8.7	7.7	61.0	50.4	649	28
Wildryes[2]	6.5	5.6	70.0	45.1	1734	11
Wheatgrasses[3]	6.1	5.6	67.1	41.5	1471	35

[1]Average of alfalfa, sainfoin, and cicer milkvetch; [2]average of five wildryes; [3]average of seven wheatgrasses. From 2001 University of Wyoming Agricultural Experiment Station Progress Report, pp. 129-135 (available on internet at http://www.uwyo.edu/ag/ces/pubs2.htm). [4]Average of five winter sampling dates, Nov. 5, 1998 to Feb. 26, 1999. Estimated TDN = 88.9 - (0.779 x ADF).

Forage kochia retains higher nutrient value through the winter than most species. Cows on the Broadbent Ranch in Uinta County have grazed forage kochia from January through March with minimal supplementation. Forage production is several times greater than that of the adjacent sagebrush-dominated range.

Establishing the stand

The seedbed should be prepared as it would be for any other forage seeding. The seed is very small (there are more than 400,000 seeds per pound) and must be planted no more than 1 / 16 inch deep. Broadcasting on the soil surface or a snow cover in winter or early spring has been the most successful establishment method. "Immigrant" forage kochia has been recommended in a seeding mixture with crested wheatgrass (Monsen et al. 1990). Crested wheatgrass should be drilled in a separate operation at ½ to ¾ inch deep.

The seed loses viability after one year, (earlier if improperly stored). Less than a pound of forage kochia per acre in mixtures with grasses is needed. "Immigrant" is the only released variety.

Grazing management

At this time, definitive recommendations on grazing management are not possible because grazing trial information is very limited.

References

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