

Native to Africa, crabgrass was introduced in 1849 as draft animal feed. Crabgrass grows in each of the 48 continental states of the United States. It produces best from Kansas to the east and south coasts in the United States. Crabgrass has indeterminate growth characteristics. It makes vegetative growth, seed heads and ripe seed simultaneously all summer. (Dalrymple, 1996).

## Varieties

There are 235 species of crabgrass (*Digitaria*) in the world. There is large variation of growth characteristics both between and within species. Red River crabgrass was developed from a "hairy crabgrass" species *Digitaria ciliaris* at the Samuel Roberts Noble Foundation in Ardmore, Oklahoma. It was named after the Red River in southern Oklahoma where the parent plant was discovered (Dalrymple, 1996).

Red River crabgrass is a runner grass that spreads by stolons. The plant roots down wherever the stolon joints touch moist soil. It has very competitive regrowth. Stolons can reach 4 feet in length within one regrowth period. It has a prostrate growth behavior under stress but grows erect under desirable conditions. Red River crabgrass can grow over three feet tall. It produces seed sufficiently for volunteer reestablishment. This crabgrass has an acceptable leaf to stem ratio and is relatively insect and disease free (Dalrymple, 1996).

Red River crabgrass is adapted best for the mild and some temperate areas of the United States. It grows well in the hardiness zones 6 to 10. It thrives in warm weather (80-100F), warm soils, moist conditions, and well-drained soils that do not crack when dry. Crabgrass responds well to nitrogen fertilizer. It has poor tolerance for extremely saline or alkaline soils (Dalrymple, 1996).

A hay harvest of crabgrass during the first growth can have 15-20% crude protein and 65-75% digestibility. A desired haying height is 1.5-2 feet tall. When haying, leave at least one green leaf on most stems for quicker regrowth. Strips can be left unmowed for reseeding (Dalrymple, 1996).

## Forage Yield

Under moist, fertile conditions, Red River crabgrass can yield 125 pounds per day per acre. A 21-year average at the Noble Foundation is 3,075 pounds of dry weight crabgrass per acre double cropped with 4,285 pounds per acre of winter pasture. Together these double crop forages totaled 7,361 pounds per acre. Crabgrass trials have demonstrated Red River increased yields 25-50% more than good native types. First year production of broadcasted seeded crabgrass averaged 2,260 pounds of dry forage producing 226 pounds of beef from 50 pounds of nitrogen fertilization (Dalrymple, 1996).

Irrigated crabgrass and rye/triticale produced 250-260 cow days of grazing per acre under continuous grazing management on the McCurry brothers farm near Burrton, Kansas. Dry matter production averaged 4.2 tons per acre over three years under irrigation (Westfahl, 1998).

## Fertilization

Red River crabgrass averaged 25 pounds of grass per pound of applied nitrogen under good management. Usual nitrogen rates for moderate yields under dryland production range from 50 to 100 pounds per acre (Dalrymple, 1996). A conservative recommendation is one pound of nitrogen for each active growing day for crabgrass. Crabgrass can absorb up to four pounds of actual nitrogen under a nutrient disposal system for animal waste (Dalrymple).

## Livestock Gain

Red River crabgrass is among the most palatable summer forages. The Noble Foundation in Oklahoma began grazing trials in 1974. Since then, steer and heifer performance trials have averaged daily gains 1.8 pounds on medium quality crabgrass. Optimum conditions have increased daily gains to 2.5 pounds (Dalrymple, 1996).

## Establishment and Forage Rotation

A management practice with 24 continuous years of success has been rotating winter annual forages such as rye with warm season crabgrass. The small grain forage is planted each fall and the crabgrass is allowed to reseed itself each year. A desired amount of volunteer seed is a quarter of teaspoon of seed for every square foot. Most of volunteer crabgrass comes from seed between the soil surface and the top half inch of soil. However, seedlings can emerge from seeds as deep as 1.5 inches (Dalrymple, 1996).

A double crop crabgrass does best on sandy soils, loam soils are preferred second, and clay loam soils are a third choice. Crabgrass does poorly on clay and silt soils. Shallow (2-4 inches deep) fall and spring tillage is beneficial on loam and clay loam soils. At least one tillage a year is recommended on any soil. Failures in this system have been due to plugging during wet weather, excessive lodged residue, livestock trampling of emerging seedlings and deep tillage which buries seed (Dalrymple, 1996).

Crabgrass can be satisfactorily established by overseeding into small grains, planting into a prepared seedbed or no-till planting. The optimum establishment method for crabgrass in the first year is to prepare a good seedbed and drill in the Red River variety in early May or after the deciduous oak trees begin to leaf out. A less desirable but satisfactory approach is to broadcast seed crabgrass. General recommendations for broadcast seeding are listed below (Dalrymple, 1996).

1. Start with cereal rye or wheat.
2. Broadcast three pounds of pure live seed per acre in a fertilizer mix between February and May. Dry sawdust, cracked grain, dry sand, and fertilizer can be mixed with the crabgrass seed to provide bulk for better distribution. Be sure to check the spread of the seed to figure the desired swath overlap. Fertilizer usually is thrown twice as far as the crabgrass seed.
3. Completely graze out the small grain to remove competition for the emerging crabgrass.
4. Topdress with 50 to 100 pounds per acre of nitrogen after the crabgrass reaches the 5-leaf stage with forming runners.
5. Rotationally graze after the grass reaches 6-8 inches height.

The usual management practice at the Noble Foundation in Oklahoma is to disc, roll the soil with a cultipacker, and drill in Maton cereal rye at a rate of 110 pounds pure live rye seed per acre in seven and

one-half inch rows. 12-40-0 pounds of N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O are banded in the row with the rye seed. After emergence, 100 pounds of nitrogen per acre are topdressed for fall grazing. Another application of 100 pounds of nitrogen is applied in late winter for spring grazing. Costs for the rye pasture establishment total around \$90 per acre (Dalrymple, 1996).

After spring rye grazing at the Noble Foundation, the rye is disc harrowed to a depth of three inches and rolled to promote a volunteer crabgrass stand. 100-0-62 pounds per acre of N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O was topdressed before crabgrass emergence. These operations cost about \$43/acre. In order to control spiny pigweed, the crabgrass pasture is sprayed once every three years with 2,4-D amine at 1.1 pounds per acre (Dalrymple, 1996).

Crabgrass can be grown with other grasses and legumes. Lespedeza is a good companion legume. Crabgrass can be established in thinning alfalfa stands. Crabgrass does grow well with orchardgrass when there are six inches spaces between bunches. Crabgrass can also grow in thin smooth brome stands if the cool season grass is aggressively grazed to allow the crabgrass to compete (Dalrymple).

To increase crabgrass in established tall fescue, aggressively graze the fescue in the spring followed by a summer rest period. If the crabgrass is fully grazed in the summer, the fescue will come back vigorously in the fall. To reduce summer crabgrass infestation, reduce spring grazing and the summer rest period (Gerrish, 1998). Fescue appears to have an allelopathic influence on crabgrass (Dalrymple).

## Grazing Management

Research at the Noble Foundation found crabgrass is significantly more palatable than 14 other warm season grasses commonly found in Oklahoma. These grasses included Johnsongrass, Indiangrass, lovegrass, bluestem, and bermudagrass (Dalrymple, 1976). Crabgrass appears to be stimulated by grazing and maintains its palatability well into maturity (Gerrish, 1998).

Crabgrass can fail to reseed under continuous over grazing. It does best under rotational grazing with rest periods for regrowth and setting seed. Rotational grazing also increases utilization of winter cereal pastures. At the Noble Foundation cattle graze the fall rye in two or three rotations leaving a three-inch residue for regrowth. An additional two or three spring grazing rotations of rye leaving a three to six inch residue for regrowth (Dalrymple, 1996).

To achieve optimal performance, crabgrass can be grazed with two herds after the crabgrass is two to four inches tall and well tillered. The first grazers should be stockers turning higher quality forage into higher gains. Replacement heifers can follow the topgrazing steers to clean up the paddocks. An ideal rest period of three weeks permits fresh regrowth to be grazed again by the steers. This grazing management with two herds can increase performance 40%. Allowing crabgrass to become over-mature shuts down growth. In general, crabgrass yields increase as time of harvest, stage of growth, and recovery period are increased (Dalrymple, 1996).

In Oklahoma, crabgrass managed as a single crop was available for grazing 129 days or 35% of the year. Under a double cropping season, rye was available for 157 days of grazing or 43% of the year. Double cropped crabgrass was available for 72 days or 19% of the year. Together, rye and crabgrass were available for 227 days or 62% of the year. Growing a small grain pasture double cropped with crabgrass significantly increases forage productivity (Dalrymple et al. 1991).

### **Nutrition**

Crabgrass has relatively high digestible dry matter (DVM) with equal or higher crude protein compared with other grasses. Red River crabgrass has tested to be 73% digestible. During the first growth cycle crabgrass can be expected to have crude protein levels between 25-30%. Mid-summer growth lowers crude protein levels to 15-20% while late summer regrowth with low rainfall and fertility can drop crude protein below 10% (Dalrymple, 1996).

### **Seed Source**

Red River crabgrass seed can be purchased from Elstel Farm and Seeds, R.L. and Pat Dalrymple, 2640 Springdale Road, Ardmore, OK 73401-9106, 1-800-858-7333.

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## CREDITS

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