

USING PLANNED VOLUNTEER CRABGRASS (*DIGITARIA* SPP.) IN DOUBLECROPPING WITH COOL SEASON ANNUAL FORAGES

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ABSTRACT

Crabgrass (*Digitaria ciliaris* Retz., *D. sanguinalis* (L.) Scop. and other species) is used as a real and planned forage. The major known use is in Oklahoma and about 19 other Southeast United States as a doublecropping or multicropping forage production approach whereby, crabgrass is the summer season forage and cool season annual grasses, with or without cool season legumes, are used as the winter season forage. High quality forage is thus produced up to over nine months of a year. Cereal rye (*Secale cereale* L.) and crabgrass doublecropping has produced up to over 10,000 pounds of grass per acre. Both winter and summer season forages can be utilized many different ways. This technique of grassland management is expanding into other areas and it is adaptable to subtropic, mild and temperate regions where rainfall is about 20 inches to over 60 inches per annum.

KEYWORDS

Crabgrass, fingergrass, *Digitaria*, high quality forage, doublecropping, reseeding annual

INTRODUCTION

The "crabgrasses" are a large group of grasses in the genus *Digitaria*. Numerous species are adapted throughout the mild, temperate and subtropic regions of the world. There are about 235 species native or naturalized species of *Digitaria* in the world, 35 in the United States and 6 in Oklahoma (Tyrl, 1994). In Oklahoma all six species are warm season annuals. The major use of crabgrass, in the US, as a real forage is the southeast 20 states with limited but increasing use elsewhere.

The two major pasture and hay type species with good production in Oklahoma are *D. ciliaris* Retz. and *D. sanguinalis* (L) Scop. (hairy and large crabgrass). All species, however, offer a high quality bite. Other species present, and undesirable ecotypes (from a forage prospective) of these two species, have not been worthy of planned purposeful forage production agronomically or economically.

A very good forage type of hairy crabgrass has been selected, developed and publicly released as cultivar 'Red River' (Dalrymple, 1994). This is the first known crabgrass variety/cultivar development and release in world history of these types of annual, reseeding crabgrasses. Seed is commercially and publicly available.

The Red River cultivar of crabgrass and other productive ecotypes have superb forage attributes: (1) Superb summer forage quality and palatability, (2) Good to excellent forage production, (3) Essentially non-toxic forage, (4) Excellent double or multiple forage cropping and mixture capability, (5) Excellent soil conservation capabilities, and (6) Excellent environmental management (effluent management) capability.

Crabgrasses in the U. S. have been somewhat relegated to weedy plant status since European farming began due to the excellent capability of the grasses to establish, persist, co-exist and compete with numerous commodity crops and other forages. These same characteristics make them good forage plants. This social stigma has blinded researchers and producers to the excellent forage attributes of good crabgrasses, but this has greatly changed positively

during the last two decades. Noble Foundation agricultural personnel have done the mass amount research and demonstration work in the world on using crabgrass as a planned and real forage. It is managed as a planned natural reseeding annual, thus simulating a perennial.

This presentation partially summarizes some of 25 years of research, demonstration and practical (producer) experience with doublecropping or multicropping in the same field and same year with good forage ecotypes of crabgrass. Crabgrass can also be managed as a single crop forage. This information has not been previously published in an international format. Numerous reports are available on request (Dalrymple, various dates).

Examples of Doublecropping With Crabgrass

The major two reasons producers use crabgrass for forage is: (1) It is among the highest quality and palatability summer forages available and (2) It is relatively easy to double crop with cool season annual forages.

The longest consecutive years of a crabgrass and winter annual grass pasture known is now into the 25th year. It is a hairy crabgrass (cv., Red River) and cereal rye doublecropping syndrome for forage on the Noble Foundation Pasture Demonstration Farm in Oklahoma. The first 21 years of production revealed that the crabgrass produced about 3,075 lb./ac. of dry basis forage, rye produced about 4,285 lb./ac. of dry basis forage for an annual total of 7,360 lb./ac. of dry basis forage (Dalrymple, et al, 1991). This forage was produced with an average of 83 and 181 lb./ac. actual nitrogen for crabgrass and rye plus phosphorus and potassium according to soil test results. Green forage distribution is much greater with the double cropping approach than either crop as a single forage. This syndrome of production is with minimum (often double and triple tandem) tillage averaging only 1.5 moderate tillages per year. The greatest yearly total forage production from both high quality components was over 10,800 lb./ac. and over 1,000 lb./ac. beef production.

Research results reveal that the double crop system produces 56% and 62% more than single crop crabgrass and single crop forage rye respectively. Doublecropping, no doubt, better uses the resources of moisture, nutrients, sunlight, temperature and time than single cropping of either forage. This syndrome of production can provide nine months, or more, of high quality forage in the Southern Plains of the U. S. A.

The tillage for cool season annual forages and crabgrass, even though minimum, greatly increases early crabgrass forage development and total crabgrass production. Increases of up to three-fold crabgrass production have been recorded, however, no-tillage approaches are also used periodically.

In the basic above syndrome of doublecropping, wheat (*Triticum aestivum* L.) and barley (*Hordeum vulgare* L.) are also used. In the milder south and more moist southeastern regions of the U. S., oats (*Avena sativa* L.) and annual ryegrass (*Lolium perenne* L. ssp. *multiflorum*) are often the producer choices for the winter phase of forage. Crabgrass and annual ryegrass can both be managed as planned volunteer stands thus enhancing economical sustainability.

Where cool season legumes produce well, they are often added to the doublecropping making the syndrome multicropping. Cool season annual legumes used are primarily hairy vetch (*Vicia villosa* Roth), crimson clover (*Trifolium incarnatum* L.) and arrowleaf clover (*Trifolium vesiculosum* L.). The biannual red clovers (*Trifolium pratense* L.) and perennial white clover (*Trifolium repense* L.) are also used in these multicropping systems. In these situations, the usual forage flow is: fall phase forage from the cool season annual grasses, late winter and spring phase forage from cool season annual grasses, spring to summer phase forage from cool season legumes and/or annual ryegrass and summer to fall phase forage from crabgrass. That completes a year. Rotational stocking greatly enhances the success of the doublecropping or multicropping system of production. All components are good to superb quality. All forage phases, including crabgrass, can be utilized as grazing, green chop, silage or hay. Grain or seed crops can also be harvested from some, if not all, forages in the multicropping approach.

Double or multicropping forages with crabgrass has been done successfully in the 20 southeastern states from about the 39½ latitude of the U. S. to the southern and eastern coasts. Annual precipitation of this large area ranges from about 20 inches to over 60 inches per annum. The area comprises about one-third of the U. S. Crabgrass and double or multicropping of crabgrass could be a useful, practical, very high quality forage in many other areas of the world where subtropic, mild and temperate climates exist.

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