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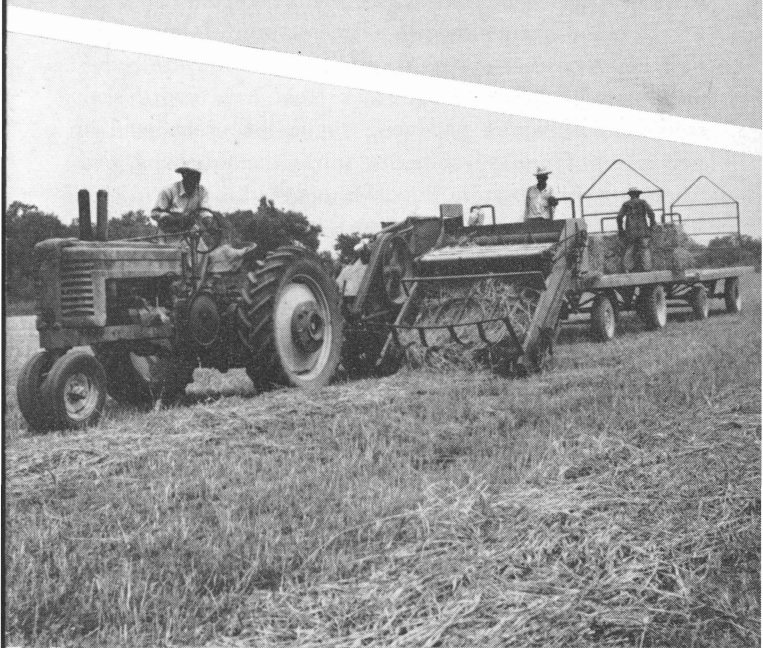
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# Johnsongrass

as a

forage

crop



TEXAS AGRICULTURAL EXTENSION SERVICE  
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# JOHNSONGRASS . . . . . As a Forage Crop

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JOHNSONGRASS IS WELL KNOWN as a stubborn, weedy pest, but relatively little has been said about its value as a forage plant. Most efforts have been directed toward eradicating the grass, rather than growing it for forage. Johnsongrass furnishes palatable, nutritious forage where it is adapted and properly managed.

This leaflet gives information that will be helpful toward obtaining more forage of good quality from established stands of Johnsongrass and from new ones to be seeded.

Johnsongrass, (*Sorghum halepense*) was brought to South Carolina from Turkey about 1830. Ten years later Col. William Johnson obtained seed and planted it in the Alabama River bottom near Selma, Alabama. Since then, the grass has spread over all the Cotton Belt.

Johnsongrass, similar in appearance to Sudangrass, is a tall-growing, warm-season perennial grass. The plant usually grows 3 to 7 feet high with relatively broad leaves and large open seedheads. The seed vary from red-brown to black and shatter readily when mature. Johnsongrass has a fibrous root system in addition to fleshy rhizomes, underground stems or rootstocks that have short, scaly sections. Rhizomes produced during one year send up new plants from the nodes or joints the following year. The grass spreads from rhizomes and seed.

## ADAPTATION

**SOILS** that are deep, fertile and moist are best for Johnsongrass. Production often is not satisfactory on soils that are low in fertility or shallow. The grass has about the same climatic adaptation as cotton.

**USE** of Johnsongrass is primarily for hay. Grazing is secondary, because very careful management is required to maintain productive stands under grazing. Hay yields usually are from 1 to 7 tons, depending on the stand and the soil fertility and moisture. During experimental tests at the Blackland Experiment Station at Temple, steers gained an average of 1.58 pounds per head per day on fertilized Johnsongrass.

Overseeding established stands of Johnsongrass with sweetclover or oats, a mixture of sweetclover and oats or with alfalfa, results in greater total forage production per acre and less competition from weeds and weedy

grasses, although the forage yield from the Johnsongrass generally is less. Overseeding also allows the land to be used for a longer period of time. This practice usually is followed east of the 30-inch rainfall line, because moisture often is not sufficient to permit it west of that line. Hubam or Madrid sweetclover generally are used north of Temple, and they are seeded at the rate of 8 to 10 pounds per acre in February or March with no seedbed preparation. For areas south of Temple, Hubam sweetclover is used, seeded at the same rate from October 15 to November 15.

When oats or alfalfa are overseeded in Johnsongrass, they should be drilled into a seedbed prepared in the usual manner. The Johnsongrass should be allowed to mature a seed crop before the seedbed is prepared, because some of the grass plants will be destroyed during seedbed preparation. The rate of seeding varies from 1 to 2 bushels per acre for oats and 10 to 15 pounds for alfalfa. Both crops are seeded at the usual planting time for the area.

In North Texas, the oats may be harvested as grazing, hay, silage or grain before the sweetclover or Johnsongrass has made much growth. After the oats are har-



*Johnsongrass overseeded with sweetclover. This practice increases forage yield per acre, reduces weed and grass competition and gives longer use of the land, although yield from the Johnsongrass is lowered.*

vested, the other two plants furnish grazing during the summer. In South Texas, the oats rarely can be harvested separately for hay or grain because the sweetclover and Johnsongrass often make as much spring growth as oats.

Corn is sometimes grown in established stands of Johnsongrass. This practice seems to work best when the corn is grown only every second or third year. After the corn is harvested, the Johnsongrass is grazed. In such a rotation, the grass normally is used for grazing only, because the corn stalks and furrows make haying difficult.

## ESTABLISHMENT

**TIME-OF-PLANTING** for Johnsongrass seed harvested several months prior to planting usually is in the spring, after the soil is warm enough for growth. Late fall and winter seedings may be made, but are not as desirable as the spring seedings. The seed are dormant when first mature, often requiring several months for complete ripening, and are not readily permeable.

**SEEDBEDS** for Johnsongrass should be well prepared, firm and moist. The seedbed for 36 to 42-inch row plantings should be as well prepared as for grain sorghum. Preparing a seedbed such as for small grain is desirable for broadcast and close-drilled plantings. The seed are planted 1 to 2 inches deep, depending on the soil and the moisture at the time of planting.

**METHOD-OF-PLANTING** will be determined by equipment available. The most practical and economical method of seeding is in 36 to 42-inch rows. With good growing conditions and proper management, the rhizomes will overlap between the rows during the first growing season and the stand the second year likely will be about as dense as a close-drilled planting. Also, the row plantings may be cultivated as needed the first growing season for weed control.

**RATE-OF-PLANTING** is 5 to 8 pounds per acre for 36 to 42-inch row plantings and 20 to 35 pounds for close-drilled or broadcast seedings, the exact rate depending on seed quality. Johnsongrass seed sometimes are of low quality, and the seeding rate should be determined on the basis of purity and germination.



*Johnsongrass is easier to manage as a hay crop than for grazing. Stands are very difficult to maintain under grazing and are easily damaged by continued close grazing.*

**FERTILIZATION** is necessary for good stands on many soils. A soil test is the best means of determining the grade and amount needed. Fertilizer for row plantings should be put down in a band 3 to 4 inches below and the same distance to the side of the seed. Broadcast applications of fertilizer encourage weeds between the rows and result in inefficient use of the fertilizer. For close-drilled or broadcast plantings, fertilizer should be banded below the seed, or it may be banded between the drills in the case of close-drilled seedings. This is especially important on Blackland Prairie and other soils high in lime.

## MANAGEMENT

**MAINTAINING STANDS** usually is a problem when Johnsongrass is utilized for hay and especially when grazed. Allowing the plant to set a seed crop builds up plant food reserves in the rhizomes. The food reserves are necessary for growth of new plants from the rhizomes formed the previous year. Removing the tops of the plants before they set seed by cutting or grazing reduces the food reserves. Some results of research by the Alabama Agricultural Experiment Station on the effect of cutting on forage production and rhizome development of Johnsongrass appear in the following table.

Newly established stands of Johnsongrass should not be cut or grazed until the first seed crop has been set. This permits the plants to develop rhizomes with food

**Effect of stage of growth at cutting on the pounds per acre of dry forage and dry rhizomes produced from an established stand of Johnsongrass cut continuously during 2 years in Alabama.**

Stage of growth when cut	First year		Second year	
	Forage, lb.	Rhizomes, lb.	Forage, lb.	Rhizomes, lb.
1 foot high	4,450	619	2,051	48
Boot	7,492	1,528	6,045	662
Seed mature	11,071	3,684	9,087	3,518

reserves, resulting in vigorous, high-producing plants. Established stands, whether grazed or used for hay, should be allowed to set one crop of seed each year, preferably in late summer or early fall.

Plowing established stands of Johnsongrass every second, third or fourth year is a common practice. Plowing apparently stimulates growth. Sometimes it is done at right angles to the rows in row plantings to scatter the rhizomes. Plowing, if practiced, should be done in early spring when the soil is moist, and the tillage should be such that as few rhizomes as possible are pulled to the soil surface. Whether plowing is necessary to maintain stands receiving good management is debatable. The Luling Foundation, Luling, Texas, maintained a stand on 25 acres for over 12 years without plowing on a deep, fertile soil. The stand was grazed moderately, and the plants were allowed to set a seed crop each year in late summer or early fall.

*HAY* made from Johnsongrass is of good quality when the plants are cut in the boot stage and cured properly. Cutting in the boot stage offers the best compromise between yield and quality. After this stage of growth, the stems rapidly become coarse and woody. Also, hay cut in this stage does not usually contain mature seed that might result in the grass spreading to areas where it is not wanted. Johnsongrass hay may be cut and cured in the swath until almost ready for baling and then windrowed and baled. Or, it may be left in the swath only long enough to wilt, with most of the curing taking place in the windrow. Curing in the swath takes less time, but the hay is more subject to bleaching from the sun.

*GRAZING* Johnsongrass closely for one or more growing seasons seriously reduces the stand, especially if the growing season is dry. Johnsongrass pastures should be divided into four or more fenced blocks to allow rotation grazing. Rotation grazing permits concentration of the animals on a relatively small area so that the forage may be removed in a short time. Then the livestock can be moved to another block to permit the plants to make regrowth and rebuild their vigor. On blocks not needed for grazing, the grass may be put up

as hay or silage. Plants should be allowed to make about 24 inches regrowth before grazing is resumed, and should be grazed no closer than 10 inches.

When sweetclover is overseeded in Johnsongrass and the mixture grazed, good grazing management is necessary because the animals may overgraze the grass and leave most of the sweetclover. Confining the animals to a small block, in a rotation grazing system, forces them to graze both plants.

Johnsongrass plants that are growing contain small quantities of cyanogenetic glucoside, which may result in hydrocyanic or prussic acid poisoning. This trouble is most likely to occur on plants stunted by drouth or frost. So far as is known, no such poisoning has occurred after the plants have thoroughly dried or when put up as silage. Drouth-stunted plants should not be grazed until 20 to 24 inches regrowth is made following rain; frosted plants should not be grazed until thoroughly dry.

*SILAGE* is not usually made from Johnsongrass because yields often are relatively low, but it makes good-quality silage. The plants should be cut in the boot stage, chopped to length of  $\frac{1}{4}$  to  $\frac{3}{8}$  inch and packed well.

*FERTILIZATION* is necessary for satisfactory production on most soils. Deep, fertile soils where Johnsongrass grows best often make fair yields without fertilization. However, production on good stands usually may be increased by proper fertilization. The protein content can be increased with nitrogen and often the phosphoric acid content can be increased with applications of phosphoric acid. Good stands should be top-dressed with 30 to 40 pounds of actual nitrogen per acre each time they are cut or grazed, if moisture is available and additional growth is desired. A soil test is the best means of determining the grade and amount of fertilizer needed.

When oats, sweetclover, oats and sweetclover or alfalfa are overseeded on Johnsongrass, fertilizer should be applied as needed for these crops before or at the time they are seeded. Then the Johnsongrass should be fertilized in the spring if best production is desired.



*Allowing the plants to set one seed crop each year, preferably in late summer or early fall, permits a buildup of food reserves in the rhizomes, from which new plants come the next spring.*

**SEED PRODUCTION** is another source of income from Johnsongrass stands, since the seed usually are in demand. There are 105,000 to 120,000 seed per pound, and the seed usually range from 90 to 98 percent purity and 60 to 90 percent germination.

Since the seed shatter readily when mature, the method often used to save the most seed is to cut the grass with a binder, cure it in shocks and then thresh. The seed may be combined direct, but many of the seed are lost by shattering. When the plants are to be cut with a binder, the best time is when the first seed are mature and ready to shatter. Direct combine harvesting should begin when the maximum amount of mature seed may be obtained. Seed combined direct will contain a great deal of green seed and should be spread in the sun and stirred frequently until dry.