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**COOPERATIVE EXTENSION WORK IN
AGRICULTURE AND HOME ECONOMICS**

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UNIVERSITY OF FLORIDA DIVISION OF AGRICULTURAL
EXTENSION AND UNITED STATES DEPARTMENT
OF AGRICULTURE COOPERATING
WILMON NEWELL, Director

SOME FLORIDA GRASSES

BY J. B. THOMPSON



Table showing average chemical composition of the grasses in this bulletin as far as they are available:

Kind of grass	Water	Ash	Crude Protein	Crude Fiber	N-F Ext.	Eth'r Ext.
Bermuda grass	9.2	7.6	7.1	25.6	48.2	1.8
Brown Top millet.....	0.0	15.2	9.9	25.9	47.0	2.0
Carpet grass	7.9	10.2	7.0	31.8	40.9	2.2
Colorado grass	0.0	18.6	9.4	30.4	40.2	1.3
Corn fodder	18.3	5.0	6.7	22.0	45.8	2.2
Crab grass hay.....	9.5	8.5	8.0	28.7	42.9	2.4
Crow-foot grass	0.0	9.7	11.6	21.2	55.3	2.4
Dallis grass	0.0	9.8	8.0	31.5	47.6	2.7
Foxtail millet, common....	14.3	6.3	8.3	24.0	44.3	2.8
Foxtail millet, golden.....	8.7	6.9	8.0	27.3	46.5	2.6
Guinea grass hay.....	10.0	15.4	6.2	20.1	45.8	2.6
Japanese cane-dry fodder	6.8	2.0	1.4	20.6	67.3	1.9
Japanese millet hay	13.5	8.2	8.3	27.6	40.1	1.6
Johnson grass hay	10.1	7.5	6.6	30.2	43.5	2.1
Natal grass hay	9.8	5.0	7.4	36.8	39.2	1.8
Napier grass hay.....	9.4	9.9	11.3	26.2	41.1	2.2
Para grass hay.....	9.8	6.6	4.6	33.6	44.5	0.9
Pearl millet fodder.....	12.8	9.0	6.7	33.0	36.8	1.7
Rescue grass hay.....	0.0	5.6	8.9	20.0	34.3	2.3
Rhodes grass hay.....	9.9	7.6	7.3	29.2	44.6	2.2
Sorghum fodder	9.7	7.8	7.4	26.1	45.9	3.1
Sudan grass hay.....	10.0	6.4	6.1	30.6	45.4	1.5
Teosinte dried fodder.....	10.6	10.3	9.1	26.4	41.7	1.9

SOME FLORIDA GRASSES

BY J. B. THOMPSON

Florida contains large areas of comparatively cheap undeveloped lands suitable for the growing of feed and forage crops of many kinds for stock. Her cheap lands, mild climate, and a long growing season offer advantages enjoyed by few other sections.

A constantly adequate source of good, cheap, nutritious forage is essential to the livestock business. With a growing interest in stock raising, there comes an urgent demand for information dealing with the various phases of our feed and forage problems.

On the following pages a number of our most important grasses are briefly discussed. In addition to those known to succeed in Florida, we list a few that have not been thoroly tried, and a few that have not proved especially promising, but concerning which there seems to be a general desire for information.

HAY GRASSES

There are various grasses sometimes advocated as hay crops for Florida. Those most frequently grown and commonly recognized as successful within the scope of their varying requirements are: Rhodes grass, Natal grass, Para grass and Carib grass, among the cultivated ones, and Crab grass, Crow-foot grass, etc., among the wild ones. Para grass and Carib grass are of more general use as pasturage than as hay, and are, therefore, dealt with as such. For the purpose of supplying information frequently called for, various other grasses of more or less limited value are included herein.

RHODES GRASS*

This grass is a native of Central and South Africa. It was first introduced into the United States in 1903 by the United States Department of Agriculture, but it was not tested at the Florida Experiment Station until 1909. It is a perennial, makes erect growth, three to five feet in height, and bears numerous long narrow leaves. Isolated plants, or plants where the stand is thin, will often throw out creeping surface runners which root

**Chloris gayana*.

and form new plants at nodes coming in contact with the ground. During a cropping season these horizontal runners may make a

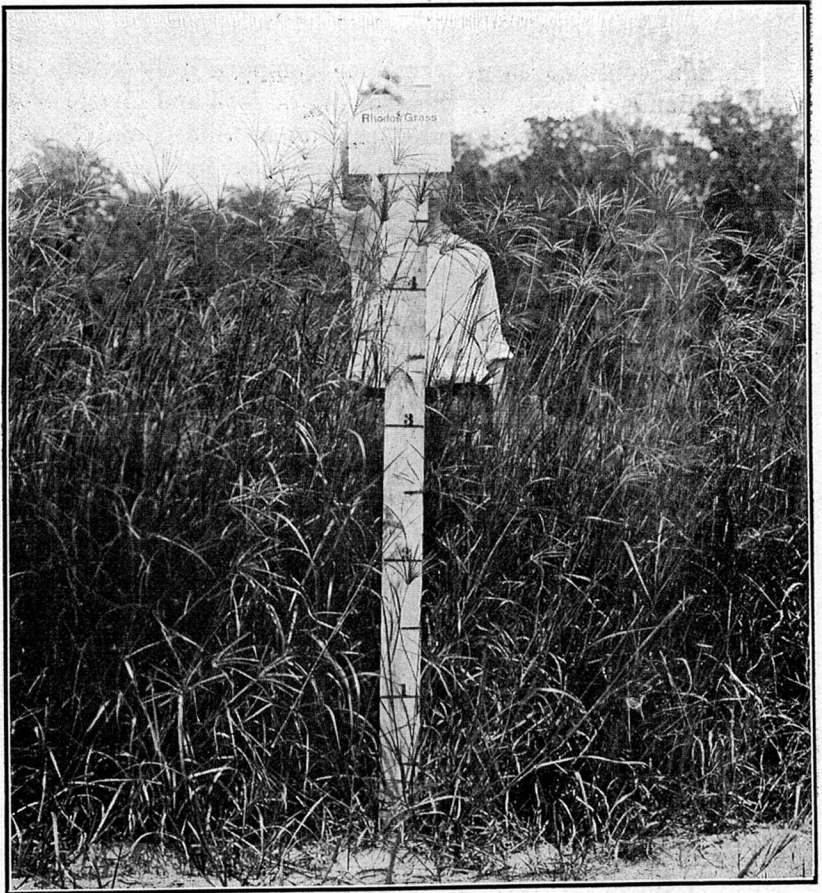


Fig. 1.—Rhodes grass, showing habits of growth

growth of from five to six feet; and this habit often improves the growth where the original stand is too thin.

SOIL REQUIREMENTS

On suitable land Rhodes grass is a valuable crop for either hay or forage. It succeeds on a variety of soils, but does best on rich soil that does not become too dry. It has not proved entirely satisfactory on light sandy ridges. On the other hand, it will not thrive on poorly drained, water-logged lands. Good hammock lands, well-drained flatwoods and, above all, the better grades of

muck are the types upon which it makes its best and most consistent growth.

Planted on highly productive muck land this grass has been known to produce three or four cuttings in a season, yielding a total weight of more than six tons of cured hay to the acre. On the same type of land it has been reported to have maintained in good condition more than two adult animals to the acre thruout the summer grazing period. Such heavy yields are, however, exceptional; and when planted on less fertile land the number of cuttings will be reduced while the annual yields may not exceed one or two tons of cured hay to the acre.

It is not generally recommended for poor lands or for soils deficient in moisture. Being of tropical origin, Rhodes grass cannot withstand low temperatures. It is seldom affected by cold in Florida, not having been injured at Gainesville during the last four winters.

As far as its control on cultivated lands is concerned, this grass may be established with the utmost impunity anywhere. It can be completely destroyed by plowing the field when the soil is dry.

LAND PREPARATION

Land intended for this grass should always be given thoro preparation. The seed is small and the seedlings are weak and frail at germination. They succeed best where a well-pulverized, fine, but rather firm, seedbed is provided. Where the land is left in lumps after the plow, the lumps should be pulverized well before being harrowed to a fine seedbed.

Like most perennial grasses it is more or less permanent when once established and should occupy the ground for a number of years. For this reason a good stand of grass and a smooth even surface subsequent to seeding are especially important considerations.

In that portion of the state where killing frosts rarely occur, the seed may be sown any month of the year, if there is sufficient moisture to insure germination. Elsewhere they should be sown in spring or early summer at the rate of from five to eight pounds to the acre.

SEEDING

The seed is sown broadcast and a light harrowing provides ample covering. The dangers of covering the seed too deeply should be strongly emphasized. The lightest covering possible is sufficient. Any deeper covering is too much.

WHEN TO CUT

Rhodes grass should be cut for hay soon after the flower heads form and before the seed itself matures. This rule must be observed in order to insure the best quality of hay consistent with heavy yields. The hay, when cut at this stage of maturity and properly cured, is an excellent feed for livestock, comparing about equally in composition with a similar grade of timothy.

NATAL GRASS*

This South African grass is said to have been brought to Florida as early as 1875. It is a tender perennial, frequently



Fig. 2.—Natal grass on pine land

injured by cold, even in the mild climate of Florida. However, if a portion of the crop is permitted to mature its seed, it acts as an annual, reseeding the ground and, on land that is occasionally stirred, provides for volunteer crops from year to year. The grass grows to a height of from two to four feet, producing an abundance of leaves and slender stems. The seedhead, which is

**Tricholaena rosea*.

strikingly ornamental, is an open panicle, at first pink or red in color, depending upon the variety, but fading to a lighter shade and becoming downy at maturity.

SEEDING

Seeding may be done from April to July. In the southern part of the state where destructive frosts rarely occur, fall plantings made in September or October are usually successful. These fall seedings make early growth and produce comparatively heavy yields during the following season.

The seed should be sown broadcast on prepared land at the rate of ten or twelve pounds to the acre. Cover lightly with a plank drag, a roller, or a light harrow. The hairy appendages of Natal grass seed cause the seeds to stick together, rendering machine seeding almost impossible and that by hand difficult. To facilitate hand sowing and permit a more even distribution, it has been recommended that the seed be moistened and rolled in soil or wood ashes just prior to sowing.

MAINLY VALUABLE FOR HAY

The principal advantage of Natal grass is its ability to grow on light sandy land where few other grasses will succeed. It is primarily a hay crop, and when cut in the early period of bloom and cured well it makes valuable forage.

If it is neglected, however, until the leaves begin to dry and the stems have become woody, the resulting feed will be of poor quality.

USE AS A PASTURE

Natal grass is grown to a limited extent for pasturing, but it is not a first class grass for this purpose and should not be selected for lands on which either Carpet grass or Bermuda grass will make satisfactory growth. The grass is not extremely palatable at first, but when cattle are kept on it constantly they acquire a liking for it and graze on it with relish.

TENDENCY TO SPREAD

The light hairy seeds of this grass are easily carried by the wind, and consequently the grass tends to spread freely to adjoining fields. It does not grow from detached joints or rootstocks. Any ordinary system of cultivation that will prevent the production of mature seed will be found effective in its control.

SUDAN GRASS*

Botanically, Sudan grass is closely related to Johnson grass and the cultivated sorghums, and it will cross or mix with any of them where they are grown in close enough proximity. It comes from Sudan, tropical North Africa, and was first introduced into



Fig. 3.—Sudan grass in Florida

this country in 1909 by the United States Department of Agriculture.

As compared with Johnson grass, its leaves are larger and more numerous, its growth is more vigorous, it is more inclined to stool or grow in bunches and its seed panicle is a little larger.

Sudan grass is especially valuable for its drought resistant qualities, and it has met with favor in the semi-arid sections of the central and northern part of the cotton belt. But it is not recommended for general planting in Florida.

SUBJECT TO BLIGHT

Good crops of Sudan grass are sometimes seen but it is subject to a serious disease known as red spot, or sorghum blight, which is prevalent in our humid climate. This disease first becomes manifest by the presence of red spots on the leaves and leaf sheaths and as it develops it spreads to all parts of the leaf surface, often turning it almost black and arresting the development of the crop.

**Holcus sorghum sudanensis*.

SEEDING

For the benefit of those who may wish to test this grass, it may be said that seedings may be made on prepared land at any time from April to June. It may be seeded with a grain drill or broadcasted and harrowed in at the rate of 25 to 30 pounds of seed to the acre. Another good method, where weeds are troublesome or where the crop is to be used for soiling purposes, is to drill the seed into cultivated, three- or four-foot rows, using

about four pounds of seed to the acre. It is utilized variously as a soiling crop, for hay or for grazing. In its soil requirements it is similar to sorghum and can be grown on almost any well-drained land.



Fig. 4.—Johnson grass, showing seedheads

JOHNSON GRASS*

Johnson grass is an erect growing perennial and, as most commonly seen, is from three to five feet in height. It is a native of the Mediterranean region of Europe, Asia and Africa. It was introduced into South Carolina from Turkey about 1830. The seedhead is of a loose spreading character and bears a resemblance to some of the sorghum varieties to which it is closely related. Johnson grass grows from strong fleshy

rootstocks and, under favorable conditions, becomes very persistent. The hay crop, which is its chief utility, furnishes a valuable feed, if cut when the seedheads first appear. Because of the danger of spreading it to lands where its growth is not wanted, by means of mature seed in the hay, it is important that it be cut before any of the seeds ripen.

PERSISTENT GROWING HABITS

In some sections of the South Johnson grass has taken full

**Holcus halepensis*.

possession of large areas of very rich lands and, under conditions most favorable to its growth, it defies all efforts towards eradication. In Florida it has not in many cases proved a serious pest or an important forage crop. There have been a few instances where it has found its way into good rich fields and proven itself persistent, but fortunately these cases have been few and isolated.

As a rule, it is believed, the planting of this grass should be discouraged. Where it will be successful as a forage crop, it will be found usually a persistent grower, difficult to kill out and a pest among cultivated crops. It is not a good pasture grass. Close grazing weakens the growth without killing it; hence, this method can not be used successfully as a means of control.

THE FOXTAIL MILLETS*

The species to which the foxtail millets belong is thought to have had its origin in southern Asia. Its cultivation and use in China is recorded in ancient history, and it was introduced into the United States at least as early as 1849. There are several varieties of this group, of which the German or Golden millet, Hungarian millet, Siberian millet and the Common millet, are the most important. Among these varieties the Common millet is the earliest maturing. It makes the finest and most slender growth and the best quality of hay. The German or Golden millet is the rankest growing variety. It requires a longer growing season than Common millet, and makes a poorer quality of hay.

Millet requires a good rich soil, and does best on land having a reasonably high content of humus. It requires fairly good drainage; but it has a shallow root system and is not a drought resistant crop. After the ground has been put in good condition by plowing and harrowing, the seed may either be put in with a grain drill or sown broadcast and harrowed in at the rate of 25 to 30 pounds to the acre.

HAY CROP

The use of foxtail millets is restricted almost exclusively to the production of hay. Their main advantage lies in the short growing period and the possibility of seeding them as a catch crop late in the season after other crops have failed or have been removed from the ground. The best hay is obtained by cutting them when the seedheads begin to show. Millet that is left

**Chaetochloa italica*.

standing until most of the seeds have matured, makes an inferior quality of hay.

Where millet is grown in the South, German or Golden and Hungarian varieties are most commonly planted.

JAPANESE MILLET*

Japanese millet is known in a number of forms, one of which is the common Barnyard grass found on low, fertile, moist lands in Florida and thruout the greater part of the United States. In addition to the name given above other common names that have been applied to it are, Barnyard millet, Japanese Barnyard millet, Sanwa millet, and Billion Dollar grass. This grass has been cultivated more or less extensively in different parts of the United States for soiling and hay, and even silage crops. It requires a rich soil and plenty of moisture.

Before planting the seed the ground should be well prepared, as for oats or rye, and the seeding made at any time from April to mid-summer. Where a grain drill is available for the seeding, 12 to 15 pounds of seed to the acre will be sufficient. Where the seeds are broadcasted the amount should be increased to from 20 to 25 pounds.

For hay this crop should be cut as soon as it begins to make good seedheads, as late cutting results in inferior hay.

The value of this crop for Florida is questionable. Under specially favorable conditions and for the dairyman it may sometimes be of value as an emergency crop to supplement pastures in late summer and fall. For this purpose it should be grown on very rich lowland, if possible.

COLORADO GRASS**

This is a leafy, branching annual with stems two to five feet in height. It is known by various other names, among which are Texas millet, Bottom grass, River grass and Austin grass. It is a native of Texas and adjacent western states, and grows with great luxuriance in some of the river valleys of that region. The name Colorado grass is given it because of its prevalence along the course of the Colorado River.

Colorado grass succeeds best on low, moist, alluvial soils, coming up on cultivated lands and in corn fields after the last

**Echinochloa frumentacea.*

***Panicum texanum.*

cultivation and furnishing a hay of good quality. As far back as 20 or 30 years ago this grass attracted considerable interest among investigators and others interested in the improvement of southern forage conditions; but the fond hopes of its enthusiasts were never fulfilled, and the limits of its profitable cultivation never spread much beyond the alluvial river bottoms of Texas, Louisiana and adjacent states, and a few other limited areas.

Colorado grass is an annual and, like Crab grass, it grows on cultivated grounds, reseeding the fields and producing volunteer crops from year to year. The seed, occasionally listed by seedsmen, should be sown in spring or early summer at the rate of 35 or 40 pounds to the acre. It is easy to control and does not become a serious pest.

This grass is not adapted to light sandy soils. It is doubtful whether it has any special value for planting in Florida, and an interest, indicated by frequent inquiries, alone leads us to discuss it here.

BROWN TOP MILLET*

This grass is often called German Hay grass and, according to the Georgia Experiment Station, it is known in different sections of Georgia as Key grass, and as sprouting Crab grass. The latter name, however, has previously been applied to a wild grass, *Panicum proliferum*, a closely related species. This is a grass comparatively new to southern agriculture, altho it has long been known as an introduced species in South Florida where it grows wild. In Arizona and the Southwest it is said often to produce heavy aftermaths of good hay in grain fields and in waste, irrigated sections. In Georgia it has been tested rather extensively during the last four or five years. It is said to have considerable value in the central part of that state, but in some other parts of the state it has not been a pronounced success.

GROWTH CHARACTERISTICS

Little is known concerning the value of this new grass for Florida and, until more is learned of it, only small, experimental plantings should be made.

Brown Top millet is an annual grass, two to four feet in height with extensive stooling habits, often producing 20 or more stems from a single seed. It resembles Colorado grass more

**Panicum fasciculatum*.

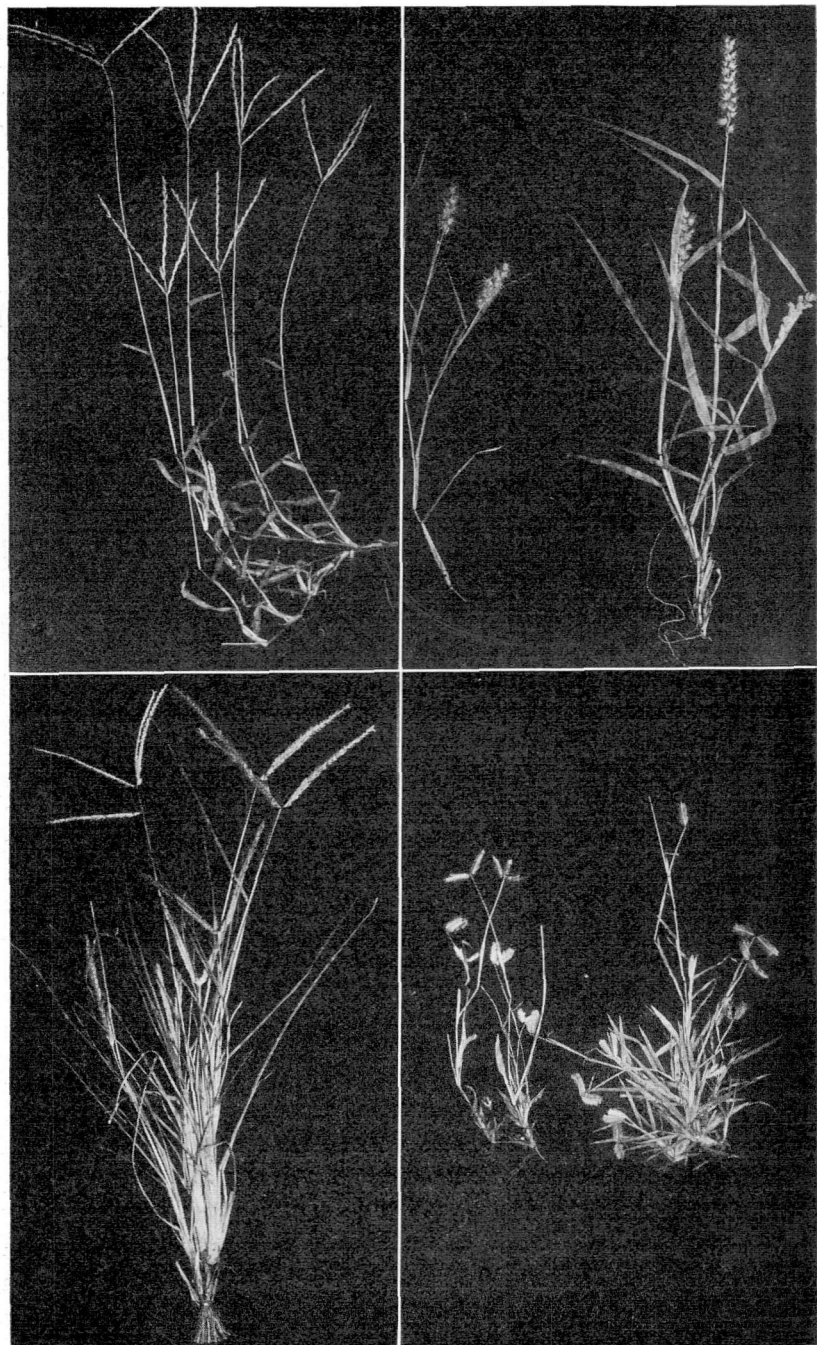


Fig. 5.—Wild hay grasses. Upper left, Crab grass; upper right, low (left) and high (right) sandspurs; lower left, Crow-foot grass (*Eleusine indica*); lower right, Crow-foot grass (*Dactyloctenium aegyptium*)

nearly than any other common grass, and is closely related to it botanically. As in the case of the latter grass there is an abundant production of seeds which are said to be a good attraction for birds and a splendid feed for poultry. The crop is commonly used for hay but may be utilized either for soiling or for grazing. It thrives best on good, rich soil which contains a reasonable supply of moisture.

SEEDING

The seeds should be sown on land put in good tilth by plowing and harrowing, and they may be sown from April to June. Using a press drill, from six to seven pounds of seed to the acre will be sufficient, but when broadcasted from ten to twelve pounds should be used to insure a good stand.

HAY FROM WILD GRASSES

Each year there is a considerable quantity of hay made in Florida from uncultivated, volunteer grasses. Data obtained from the Bureau of Crop Estimates indicate that there were 20,000 tons of such hay produced in the state during each of the years 1919 and 1920, or, if figured on the basis of the total production for the state, a quantity equivalent to 12.4 percent and 13.15 percent for the two years respectively.

As practically all this hay is obtained from waste land or fields from which farm or truck crops have been removed or on which cultivation has ceased early in the season, its production does not in any way involve the use of the land to the exclusion of the main money crop. The bulk of "wild hay" made in Florida comes from Crab grass, Beggarweed, Crow-foot grass, Mexican clover and similar plants. Properly handled, these volunteer crops produce valuable hay. Frugality and economy demand that they be carefully preserved.

CRAB GRASS*

Probably no other grass is better or more widely known in Florida than Crab grass. Only a brief discussion of its habits is necessary. Its habit of taking root again at the joints and refusing to be killed when cut off, especially during wet periods, makes a lasting impression on every farmer. But regardless of its weedy, persistent nature, it possesses valuable qualities as a volunteer hay crop that should not be disregarded. It appears on cultivated lands after cultivation has been suspended and fur-

**Syntherisma sanguinalis*.

nishes, without extra charge, a crop that is highly valuable either as hay or autumn pasture. Crab grass is a strictly volunteer crop, growing on almost any soil. The leafy, slender stems provide a hay that in feeding quality is superior to timothy. It must, however, be cut soon after the seedheads appear and before the first seeds have ripened.

CROW-FOOT GRASS*

There are two uncultivated grasses, illustrated in figure 5 of this bulletin, that are known in Florida by the name Crow-foot grass. Both are annuals, growing voluntarily on cultivated lands or in fields recently plowed. They are usually found growing with such varieties as Crab grass and rarely occupying the ground to the exclusion of other grasses. Their chief value arises from the fact that they often grow voluntarily with other plants, increasing the tonnage of wild hay where it would otherwise be light. The hay made from either of these species is a little inferior to that from Crab grass, but it makes a useful feed, if cut when the first seedheads appear. They are both uncultivated grasses and the seeds are not obtainable on the market.

On every farm where hay is made or used the wild hay crop should be anticipated at the last cultivation. The land should be left with a smooth, even surface so as to permit the use of modern hay making implements. This is a general rule that applies to all uncultivated grasses.

SAND-BUR GRASS**

The well known sand-bur, so common on waste and cultivated sandy lands thruout the state, is usually regarded as a troublesome and noxious weed rather than a forage plant. The group broadly known as Sand-bur grass comprises a number of distinct species.

TALL SAND-BUR GRASS VALUABLE FOR HAY

The name "Tall Sand-bur" is a little more specific and is restricted to species of rather erect, leafy growth. These grasses often attain a height of from one to two feet and are valuable for hay, if cut before the "burs" have hardened. A species of this group is illustrated in the largest and most leafy specimen in figure 5. It grows on sandy lands and in combination

*One species, *Eleusine indica*; other species, *Dactyloctenium aegyptium*.

** (High) *Cenchrus echinatus* and others.

** (Low) *Cenchrus pauciflorus*, possibly others.

with other volunteer grasses. There is some hay made from it in Florida every year.

CROPS FOR SOILING AND SILAGE

One of the most economical means of furnishing roughage when pastures are dry is by planting some suitable soiling crop early enough that it will be ready to cut at about this period.

The most important crops of this class are sorghum, corn,



Fig. 6.—A good crop of sorghum

and Japanese cane. Napier grass, tho a comparatively new crop to Florida, is meeting with favor as such a crop. A few other crops of limited value are also included in the discussions on the following pages, merely as a means of supplying information that seems to be demanded.

SORGHUM*

Sorghum is of African origin, and was introduced into the United States at least as early as 1857. The saccharine, or sweet sorghum group, including many varieties, is important as a forage crop and for the manufacture of molasses thruout a large section of the United States. The sorghums are more drought

**Holcus sorghum*.

resistant than corn, and are especially valuable for growing in sections deficient in rainfall or for light soils that do not retain adequate supplies of moisture for corn production. In Florida they are grown chiefly for soiling purposes and for silage. Under like conditions on poor soil sorghum will probably yield a tonnage 40 to 50 percent greater than corn. Furthermore, it is more successful when planted late in the season, and it can be counted upon with a greater degree of certainty to yield a good crop when too late in the season for planting corn.

SOIL REQUIREMENTS

The soil requirements of this crop are similar to those of corn, but the former will often prove more satisfactory than the latter on light sandy soils, owing to better drought enduring qualities. Sorghum is not unlike other heavy producing crops in that the richer soils usually produce the heavier yields. Badly depleted soils should be improved by the addition of fertilizers, if good yields are to be expected.

VARIETIES

In the selection of a variety for planting in Florida, it is to be remembered that the question of early maturity is of much less importance than in sections of a short growing season. Farther north some of the early maturing varieties, such as Early Amber, Red Amber, Dakota Amber, and Minnesota Amber, are the more popular kinds. But these varieties produce relatively small yields, and some of the later maturing kinds are preferable for Florida. Varieties listed in southern seed catalogs under such names as Sumac or Red Top, Japanese Honey, Sugar Drip, or Texas Seeded Ribbon will be found satisfactory.

TIME OF PLANTING

The planting season in Florida varies somewhat with the location. At Gainesville and farther north plantings may be made any time from April 1 to June 15. The season opens earlier farther south. Plantings made in early July sometimes succeed, but it is not advisable, especially in North Florida, to delay the planting later than the last of June, as after this time results are uncertain. Young plants are weak and are slow to start growing; but after becoming six or eight inches high, they grow rapidly. It is well to have the crop past this initial period of slow growth before the excessive rains start. During an extremely wet period weeds may grow and choke the young plants while they are too small to cultivate.

PLANTING

The seeds should be drilled in rows about four feet apart and an effort should be made to get a stand of plants from two to six inches apart in the rows. Such a stand can be secured by use of an ordinary corn planter, equipped with a special plate, and by using from six to eight pounds of seed to the acre.

SORGHUM AS SILAGE

For silage the crop should be harvested when the grain is about mature, insuring not only the maximum acre yield of dry matter, but also silage of the highest quality. Silage from immature sorghum shows a high degree of acidity and is of inferior quality. On the other hand, when the crop is cut at the proper time and properly preserved, it is sweet and palatable. It has been shown by results of many careful feeding tests that there is but little difference in the feeding value of corn and sorghum silage, pound for pound, when used either for milk or for beef production.

CORN*

The habits and culture of corn are so well understood that but little discussion is necessary here.

Chiefly a grain crop, corn is one of Florida's most important farm products. The Bureau of Crop Estimates reports that in 1920 the area planted to this crop in Florida was 781,000 acres, an acreage almost as large as that devoted to all other farm crops combined during the same period.

JAPANESE CANE**

The original introduction of this cane is said to have been made from Japan under the direction of Commissioner W. G. Le Duc of the Federal Department of Agriculture. This was sometime during Commissioner Le Duc's administration, from 1877 to 1881. Sometime about 1885 or 1886 this old variety was brought into Florida from Louisiana.

IMPROVED JAPANESE CANE

In 1910 the Department of Agriculture received, also from Japan, four other varieties which are noted, in Bureau of Plant Industry Bulletin 227, under the following names and numbers:

SPI No. 29106, "Chikusho. Early variety."

SPI No. 29107, "Early variety from Kagawa Ken."

**Zea mays.*

***Saccharum officinarum.*

SPI No. 29108, "Kikaigashima. Early variety from Kagoshima Ken."

SPI No. 29109, "Oshima. Early variety from Kagoshima Ken."

These latter introductions have been tested at the Florida Experiment Station for several years. They have also been grown by many farmers thruout the state. They seem to show a marked similarity, but the consensus of opinion seems to give them a distinct superiority over the variety originally intro-



Fig. 7.—A heavy growth of Japanese cane

duced. The varieties of this late introduction are frequently designated as "Improved Japanese cane."

SOIL REQUIREMENTS

Japanese cane can be grown on a wide range of soils but, like most other heavy producing crops, the largest yields usually come from the better grades of land. On good soils, kept highly productive, it will continue to give good returns for many years, and frequently the harvest will tend to increase for two or three years after planting. But on lighter and poorer soils, profitable crops will not continue so long, each succeeding crop being lighter than the preceding one. The great advantage of this cane is in its remarkably heavy yields. First crops on good pine

land should yield from 15 to 25 tons to the acre, while on rich hammock land, or on the better types of muck, the yields may run as high as 30 or 40 or even more tons.

PROPAGATION

Propagation, as of other varieties of sugar cane, is by means of mature canes. The canes may be cut and banked before frost in the fall and planted to the field in March, or they may be planted direct to the field when harvested in the fall. Spring planting has the advantage of permitting the elimination of poor canes and dead eyes that have not lived thru the winter. If planted direct to the field in the fall, these canes that fail to come thru the winter will leave gaps in the stand.

In planting, the canes are dropped horizontally in six-foot parallel furrows and covered with five or six inches of soil. In order to insure a good stand, it is advisable, where enough seed are available, to drop the canes in a double row, making two continuous lines of canes in each furrow. This method, with rows six feet apart and seed canes averaging four feet in length, will require from 1800 to 2000 canes for each acre of land. The canes are usually cut into lengths of three or four joints before planting, as inner joints on long uncut canes sometimes fail to grow.

JAPANESE CANE AS SILAGE

There has been considerable diversity of opinion concerning the value of Japanese cane silage. There are many stockmen in the state, however, who have fed it and value it highly. At the Florida Experiment Station, where it has been fed annually for several years, it has given satisfaction. It carries no grain and is, of course, not equal in feeding value to good corn or sorghum silage. It is advisable to feed in conjunction with silage a more liberal ration of concentrates. Sugar, the important food nutrient of Japanese cane, develops rapidly as the crop matures, and it is necessary that harvest be deferred as long as it is safe without endangering the crop to frost.

At the Experiment Station the crop is cut about November 10. The leafy nature of this crop demands that it be thoroly wet when it goes into the silo and that special care be taken in trampling or packing it. Where running water is available, a small stream, run thru a hose and trained on the cutting knives,

will thoroly wet the fodder and let not too much free water reach the silo.

Japanese cane silage is not as palatable as that from corn or sorghum but, if fully matured, abundantly moistened on entering the silo, and thoroly packed, it makes a good succulent and valuable feed. Some growers object to the silage but find cutting and storing it in large banks for winter feeding a profitable practice. Most of the leaves are lost by this method but the canes remain fresh and succulent as long as the weather is cool.

Japanese cane is a perennial, and is adapted to a wide range of soil conditions, including types on which corn or sorghum do not always thrive.

NAPIER GRASS*

This species is native of Tropical Africa and was first introduced into the United States in 1913 by the Federal Department of Agriculture. It is a rank growing, cane-like, non-saccharine perennial, developing clumps with many coarse, leafy stalks.

On good land and where the plants have plenty of room, 100 or more canes may be produced by a single plant, but on average soil and under ordinary methods of field planting it tillers less extensively. As the plants approach maturity, they branch from the upper joints, sending up a fine, erect stem which bears a terminal seedspike. This seedspike is yellow when mature and resembles, in a general way, that of Pearl millet, to which it is closely related.

HOW TO USE

The young rapid growing fodder from this plant is succulent and eagerly eaten by stock. In this stage it compares favorably with green corn in feeding value, but contains a much larger percentage of protein. The principal use of this grass is as a soiling crop, for which it should be cut when four or five feet high and while still succulent and tender. After the joints begin to form it soon becomes tough and woody and there is much waste in feeding. A considerable portion of this waste may be saved by the use of a feed cutter. The crop has also been used to a limited extent for silage and, while its value has not been fully demonstrated for this purpose, the results have been promising.

**Pennisetum purpureum*.

Where it is to be put in the silo it should not be cut as early as if intended for a soiling crop.

PROPAGATION

The cheapest and most practical method of propagating Napier grass is by means of the canes or mature joints, tho either the seeds or root divisions may be successfully used. Cane cuttings of three or four joints may be dropped 18 to 24 inches apart in six-foot furrows. These cuttings should lie horizontally and be covered by a single shovel plow to a depth of five or six inches.

SOIL REQUIREMENTS

Any soil that will grow good crops of corn or Japanese cane will be found suitable for Napier grass. The best yields will be from the most fertile soils. On rich soils the yield of fodder is heavy. It should be given about the same cultivation as Japanese cane.

MERKER GRASS*

Merker grass, like Napier grass, is from Tropical Africa and was introduced by the United States Department of Agriculture



Fig. 8.—Merker grass

in 1916. At the time of its introduction this grass was supposed to belong to a species distinct from Napier grass, but it developed

**Pennisetum purpureum*.

later that the two are of the same species. They are similar in appearances and habits, and are propagated and used in the same general ways. Merker is distinguishable from Napier grass in having smaller canes, narrower and more erect leaves and a little more of the white, waxy bloom on the canes. Merker also shows more tendency to branch, and it seeds earlier and more freely than does Napier. Under some conditions there is a marked difference in the vigor of these two grasses, Napier being the more robust. At Gainesville this difference is not easily noticeable.

GUINEA GRASS*

Guinea grass is a native of Tropical Africa, but it has been introduced more or less extensively into the agriculture of nearly all tropical countries. It was brought into Florida at least as

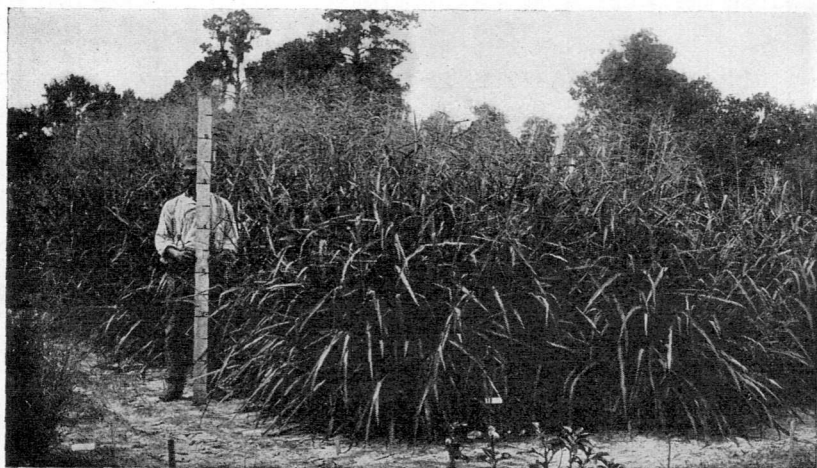


Fig. 9.—Guinea grass in full bloom

early as 1870, but has not in 50 years won a place among the important forage crops of the state. Guinea grass is a vigorous growing, leafy perennial that develops dense clumps from five to eight feet or more in height and bears large open-spreading panicles.

SOIL REQUIREMENTS

It thrives best on well-drained, moist soils rich in humus and plant food. There are few other grasses that respond more quickly to liberal applications of stable manure. Being a native

**Panicum maximum*.

of the Tropics, it delights in a warm climate and production falls off sharply with the advent of cool weather.

PLANTING

As regards the methods of planting, either seeds or divisions of the root clump may be used. But it succeeds best when grown in cultivated rows. Good stands and proper intervals are most easily secured by hand planting. Seedlings, when from six to eight inches high, may be pinched back and set in rows four or five feet apart, leaving intervals of about 18 inches between plants.

Under optimum conditions, where growth is rapid and the leaves and stems are succulent and tender, this grass makes a valuable green feed. Successive cuttings may be made, under these conditions, as often as every five or six weeks during the warm growing season. One objection to it is that it is very exacting in its demands and does not thrive where these demands are not fully met. On dry or poor light lands, it makes a relatively slow, stunted, woody growth; and on good land, if cutting is neglected until the grass begins to form seeds, it becomes woody and loses its succulence and palatability.

TEOSINTE*

Teosinte, introduced into the United States many years ago, is a native of Mexico and a section southward thru Central America and a portion of northern South America. It is an annual grass, remarkably leafy and robust in growth, and under favorable conditions it attains a height of from 10 to 14 feet. It stools or suckers extensively, frequently developing as many as 25 stalks from a single seed. The stalks, tho large and coarse, are tender and succulent and eaten with relish by all classes of livestock, if cut before the seeds form. For feeding it is especially valuable because of its extreme succulence and palatability.

LUXURIANT GROWER

Teosinte makes its best growth on good, rich soil, requiring an abundance of soil moisture and a long, warm growing period. It is a prodigious grower, there being authentic records of its yielding 50 tons green feed to the acre in one season. Under favorable conditions two or three cuttings can be had in a year and the fodder, when green, is relished by cattle and other farm animals. It should be cut when about five feet high, since the stalks are hard and woody later.

**Euchlaena mexicana*.

PLANTING

This crop is grown from the seed which should be planted in hills four or five feet apart. The preparation and subsequent cultivation of the land is similar to that of the corn crop. From one to one and a half pounds of seeds are required to plant an acre. The plant has been grown to a limited extent in Florida for many years, but its cultivation has not become general.

PEARL MILLET*

Pearl, or Cat-tail millet is related to Napier and Merker grasses and, like them, had its origin in Tropical Africa. It was introduced into the South before the War Between the States and has been cultivated to a limited extent since that time. In general appearance it resembles sorghum, but bears a large cylindrical seedspike. The plants stool freely and on good land grow to a height of from eight to fifteen feet. Under very favorable conditions Pearl millet will sometimes produce remarkably heavy yields. Founded largely on some of these exceptional instances, varied and extravagant claims have sometimes been made for it. Several years ago it was exploited by certain seedsmen under such names as Mand's Wonder forage crop and Penicillaria. Authentic records of as much as 40 tons of green feed to the acre have been made. The crop has been grown in the South for more than 60 years, yet in no section has it established itself in any permanent system of farming.

PASTURE GRASSES

Grasses are like most other farm crops in that they do best on good, rich soil, tho in practice this fact is often overlooked. The waste lands of the farm, which are unproductive or for some other reason are not suitable for farm crops, are often fenced as the farm pasture. With constant grazing, the manure being left in the field, the land tends to become richer, but only rich soils, to which the grass is adapted, insure first class growth. By the wise selection of a grass it is sometimes possible to utilize lands not perfectly drained, or which, for some other reason, are not suitable for growing general farm crops. Under such circumstances it is good economy to turn them to this use. But in live-stock farming a good pasture is worthy of the best land on the farm, if it cannot be grown elsewhere.

**Pennisetum glaucum.*

BERMUDA GRASS*

Bermuda grass is supposed to have come from Southern Asia but, while it has been an important grass in the South for more than 100 years, the exact date of its introduction into the United States is not known. As a southern pasture grass for those soils to which it is suited, it has no superior. But on the other hand, where it finds its way into cultivated fields, it becomes an aggressive and tenacious weed that resists almost every effort toward its eradication. It is this persistent habit which renders it difficult to cope with among cultivated crops, and which enables it to withstand the trampling and abuse incident to the heavy grazing of stock. It will grow on any well-drained, good farm lands except the high pine lands and light sandy ridges that tend to become very dry. Loamy hammock soils, well-drained sandy loams, rolling clay lands, and much of the muck soils furnish suitable conditions for its growth.

VARIETIES

There are several varieties of Bermuda grass that differ in vigor of growth, relative abundance of rootstocks, and a few other minor characteristics. The common or ordinary variety does not usually exceed six to twelve inches in upright growth under Florida conditions, and its use is restricted to grazing purposes. It is abundantly supplied with fleshy rootstalks and is correspondingly difficult to suppress where it becomes desirable to convert the land to cultivated crops.

Giant Bermuda is an exceedingly robust grass, which, on good land, may attain a height of 24 inches or more, and which, under favorable conditions, has considerable merit for hay. It has comparatively few rootstalks. In fact, the United States Department of Agriculture has studied strains which were found entirely devoid of these under-ground stems. Giant Bermuda is a little more tolerant to wet lands than is the ordinary variety; yet, if the best results are to be expected, fair drainage should be provided. The fact that it has not as many rootstalks as the common variety, makes it somewhat less difficult to eradicate, and, for the same reason, it is probably a little less persistent under the adverse conditions of heavy trampling and close grazing. The grass erroneously known as St. Lucie grass along the southern East Coast is in reality a form of Giant Bermuda.

**Capriola dactylon*.

GRASSES CONFUSED WITH BERMUDA

On wet lands and along ditches and water courses there is a creeping grass, the stems of which are tinged with red and leaves of which are short and pointed. This is Ft. Thompson grass.* It is readily distinguished from Bermuda grass, however, by its

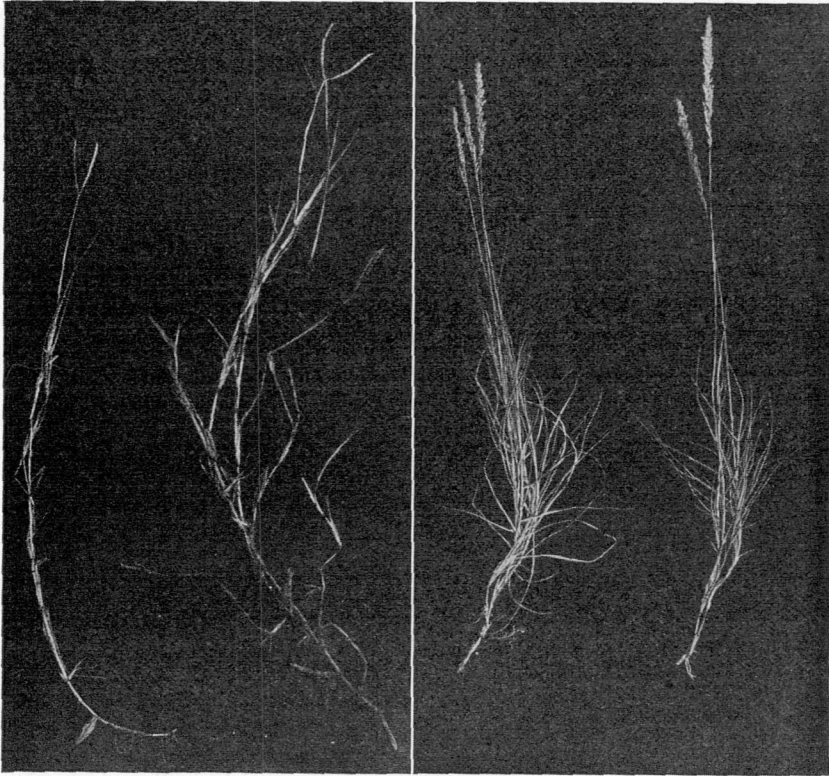


Fig. 10.—Grasses confused with Bermuda. Left, Ft. Thompson grass; right, Sea-side Rush grass

seedhead which has consistently two seedspikes shorter and less slender than those of Bermuda. Ft. Thompson grass, showing several seedheads, is illustrated in figure 10. Another grass sometimes called Salt Water Bermuda is the Sea-side Rush grass**, illustrated in figure 10. This grass occurs along the sandy beach, growing almost to the water's edge. Altho of a sort of harsh, weedy nature, it is apparently relished by stock.

**Paspalum distichum*.

***Sporobolus virginicus*.

It is not closely related to Bermuda and is easily distinguished by the spike-like seedhead.

STARTING A PASTURE

The quickest and most certain method of establishing a Bermuda grass pasture is by means of sod cuttings which are merely small portions of the sod. The land should be plowed and harrowed until a smooth surface has been established and the small fragments of sod can be thrust into the ground at intervals of two to four feet. Where the soil has been put in good tilth, a blunt pointed stick, something like a hammer handle, may be used for pushing the sod particles under the surface. Another method of planting is to plow the land broadcast and harrow to a smooth surface. A Georgia stock, equipped with a narrow shovel or bull-tongue, is then used to open parallel furrows, three or four inches deep and from two to four feet apart. The cuttings are dropped in these furrows at distances of one to two feet. A sweep run just close enough to fill the furrow may be used to cover the sod; and a light harrow, with teeth set at an angle to prevent pulling up the sod, should follow to leave a smooth surface.

STARTING FROM SEED

Altho seeds are less certain than sod they are sometimes used successfully. The seeds are small and demand a well-pulverized, smooth seedbed. They are sown broadcast when the land is moist any time from April to July. One operation with a light plank drag or a roller will suffice to cover the seeds which must not be covered too deeply.

CULTIVATION

Bermuda grass land should be plowed or disced deeply about once each year. This cultivation breaks up the sod-bound condition and loosens the turf to the great benefit of the pasture. On account of its persistent habits Bermuda grass should not be planted or permitted to spread to land soon to be devoted to cultivated crops.

CARPET GRASS*

Carpet grass is native to the West Indies, Southern Mexico, Central America, and the northern part of South America. It was collected at New Orleans as early as 1832, but the exact time and manner of its introduction into this country is not definitely known.

**Axonopus compressus*.

This grass is a low, creeping, carpet-like perennial. It reproduces readily from seed, and spreads by means of surface runners which take root at the joints. Having no system of underground stems or rootstocks, it is unlike Bermuda grass in that it can be controlled or eradicated with comparative ease. It



Fig. 11.—A Carpet grass pasture

is essentially a pasture grass, and rarely, if ever, becomes large enough to cut. The stems and leaf sheaths are compressed and two-edged. The leaves are smooth and narrow and terminate in a rather abrupt, blunt point. The small, delicate seedstem which usually bears two slender seedspikes, is well illustrated in figure 14.

A closely related species is called Giant Crapet grass*, and is distinguished from the common Carpet grass by its coarser and more robust growth. Like the true Carpet grass the stems and leaf sheaths of this species are also compressed. A photographic reproduction of a plant of this grass is shown in figure 14.

ESSENTIAL CONSIDERATION

Carpet grass requires considerable moisture but succeeds on various types of soil. It grows well on low sandy loams and thrives thruout a large area of the flatwoods sections. It is also found on hammock lands and clay soils, and in low depressions where its demands for moisture are well supplied. This grass requires considerable sunlight. It does not withstand burning well, but shows remarkable ability to resist heavy trampling. It is, as a matter of fact, most common on compact lands, and the opinion is held by some that this condition is essential to its best success. Constant, close grazing and heavy trampling aids in the suppression of many other grasses and undoubtedly gives Carpet grass better and less hampered opportunities to develop.

SUITED TO CUT OVER LANDS

The most important characteristic of this grass, and one that renders it particularly fitted to Florida conditions, is its ability to establish itself on untilled lands. The Bureau of Plant Industry, United States Department of Agriculture, suggests the following methods of converting native grass areas into Carpet grass pastures: (1) Native grasses are to be burned off during winter months. (2) The number of animals on the area is to be so controlled as to keep the grass closely grazed continuously. (3) Seeds should be sown at the rate of five pounds to the acre when moisture is abundant and during spring or early summer. It will be apparent that this method requires no special preparation of the land, and that it is applicable to lands on which the presence of roots and stumps would render cultivation impossible. But it must be remembered that these suggestions apply only to such lands as are suited to the growing of this grass.

VALUABLE GRAZING GRASS

This grass is undoubtedly one of our most valuable grasses for grazing. It is highly palatable and eagerly grazed by stock. As compared with most other grasses, the tendency to become

**Axonopus furcatus*.

woody is less pronounced. Furthermore, the carrying capacity of Carpet grass land is much greater than that of the average native pasture. In some places where Carpet grass and Giant Carpet grass grow together on lowlands, it has been observed that the latter appears to predominate. However, Giant Carpet grass probably is as valuable where it thrives as is common Carpet grass. It is an important species on some of the best ranges of the state, and is especially prevalent on pasture lands near LaBelle.

PARA GRASS*

This species also claims Brazil and the adjacent region of South America as its birth place. As early as 1880 it had become established in the United States, probably being introduced somewhat earlier than that time.

It is a rank growing, leafy perennial with strong surface runners that sometimes measure as much as 20 or 30 feet in



Fig. 12.—A field of Para grass

length. These runners take root at the joints and form new plant centers from which upright plant growth proceeds. When first planted on plowed surface, these runners are sent out in all directions until the ground is well covered. An erect leafy growth

**Panicum barbinode*.

is then started which soon attains a height of four or five feet. Para grass is essentially a warm weather grass and thrives best upon reasonably rich soils that contain an abundance of moisture.

SUITED TO WET LANDS

The habit of growing on moist, wet lands is a peculiarly valuable characteristic. Even lands with relatively poor drainage or those occasionally submerged for short temporary intervals, sometimes yield good crops of this grass.

PLANTING

Para grass is propagated from cuttings of the stem. Plantings should be made on plowed land during the warm, growing season when the ground holds plenty of moisture. Many different methods of planting are used. A good method is to distribute the canes on the surface of a plowed and well prepared soil, and then cover by running a disc harrow over the ground. An even distribution of the canes is facilitated by first running them thru a feed cutter or old style cutting box, making the cuttings several inches in length. These may be scattered from a wagon with a fork or they may be mixed with stable manure and spread with a manure spreader. Sometimes the cuttings, two or three joints in length, are simply thrust into the soil by hand at intervals of from four to eight feet in either direction. If a plant is established every eight or ten feet in both directions, growth will eventually cover the ground; but planted at closer intervals, a good stand will be hastened.

PASTURE GRASS

Under optimum conditions Para grass supplies an abundance of good, leafy herbage that can be variously used for grazing, as a soiling crop or hay. Under good conditions the carrying capacity of the pasture is high, it frequently being possible to maintain from one to two adult animals to the acre on it for several months. As far south as Dade County good pasture for six or seven months out of the year, and fair pasture for an additional three or four months, may be expected. In mild winters some pasturage may be available thruout the entire year.

HAY GRASS

Hay made from Para grass is rather coarse in texture, but it is sweet and palatable and readily eaten by stock. It should be cut before getting woody. Under favorable conditions successive cuttings at intervals of six or eight weeks are often obtained. During the period of rapid growth when a surplus above

the needs of the herd is available, it is sometimes possible and advisable to convert a portion of the pasture into a temporary hay meadow. After one or two cuttings have been made for hay the area can again be devoted to pasture purposes.

REQUIRES CULTIVATION

Sooner or later Para grass will show a tendency to choke itself out and become sod-bound. The yield will be reduced and the deep green color characteristic of vigor will have changed to a lighter hue. As a means of improving this condition and restoring the yield, the field should be plowed once a year as frequently as need is indicated. Para grass is essentially a grass for cultivated lands, and plantings made on unplowed lands around ponds or on the margins of swamps will seldom pay for the expense of planting.

CARIB GRASS*

The United States Department of Agriculture first introduced Carib grass into the United States in 1914 from Brazil. In appearance, as well as in its soil and climatic requirements, Carib grass bears a close resemblance to Para grass, tho the two have been placed by botanists in separate genera. They look almost alike, are propagated in like manner, and are used on the farm in the same general way.

In comparing the two, Carib grass seeds more freely, altho the seedheads are not easily distinguished from those of Para grass by the untrained observer. Carib makes a more nearly upright growth when first planted, has rather less vigorous habits, and is a little more leafy. It also has finer stems, and should make a better grade of hay.

At the Florida Experiment Station the roots of this grass were badly winter-killed during the winter of 1917-18, while Para grass, planted in an adjacent plot, was uninjured. Some complaint has been made that, since the initial growth of this grass is more erect than of Para grass, it does not spread over the ground or produce a thick stand as quickly as the latter.

DALLIS GRASS**

Dallis grass is native of Argentina, and was introduced into Florida and other Southern States many years ago. It is a smooth leafy perennial, that grows in bunches, showing preference for

**Eriochloa subglabra.*

***Paspalum dilatatum.*

low, moist lands. It makes good growth in warm weather, withstands close grazing remarkably well, and is not injured by moderate frosts. It will be realized that, if it can be successfully grown, this characteristic of winter-hardiness should render it most valuable as a pasture grass for Florida, since the improvement of our winter pasture is one of our most urgent needs.

In certain sections of New South Wales and other parts of Australia and New Zealand, the introduction of this grass, under the name of paspalum, or *Paspalum dilatatum*, has revolutionized the agriculture of that country. It has transformed large areas, previously occupied by a more or less struggling farm population, into a prosperous and modern, specialized dairy region. In the United States it is most important in northern and central Georgia, Alabama and Mississippi.

SOIL REQUIREMENTS

Dallis grass thrives best on a rather heavy soil, and is partial to moist lands, but, on the other hand, it is able to live thru prolonged periods of drought. When subject to drought, however, it yields but little feed. It comes on quickly after the drought is broken.

DIFFICULTY IN SECURING GOOD SEED

A disadvantage that operates to retard the spread of Dallis grass is the difficulty of getting high grade seed. The seeds do not ripen evenly and many immature ones are unavoidably harvested with the good. A black smut-like fungous growth also attacks the seeds and is responsible for much of the poor quality of the seeds found on the market. This poor quality of seed often results in disappointment to planters. But once established on a well-suited location, it makes persistent growth; while an indifferent stand will slowly improve the production of seeds which fall to the ground and help increase the growth.

SEEDING

The field selected for this grass should be plowed and harrowed to a smooth surface. The seeds should then be sown at the rate of eight to twelve pounds an acre, preferably during a warm summer period when there is an abundance of moisture in the soil. The seeds may be covered by running a disc or drag harrow over the ground.

Dallis grass does not spread from surface runners or rootstocks and no apprehension need be felt as to its becoming a pest. Those who have suitable soil and who feel the need of winter

pasturage should plant a little of this seed in a small, experimental way.

VASEY GRASS*

Vasey grass is a near relative of Dallis and, like it, is native of South America. It was brought into the United States many years ago and has become well established on many low, moist areas thruout Florida. It is an erect bunchy perennial, three to six feet high, with many long, narrow blades and seed panicles bearing from 10 to 25 spikes.

Like Dallis, Vasey grass thrives best on low, wet land. It forms large clumps and furnishes feed that is grazed readily while young, but which becomes woody and unpalatable with age. The growth remains green well into winter, tho it is said to be a little more susceptible to cold than Dallis grass. On rather light land at the Florida Experiment Station this statement has not always been borne out.

In certain sections of the South this grass is recognized for its value as a hay crop. It is said to return large yields of hay which finds ready sale on markets where it is known. When used for grazing, heavy stocking is advisable to keep the grass eaten closely, and to provide against accumulations on the ground to become harsh and unpalatable.

SEED SUPPLY

The seeds of this grass are not yet handled by seedsmen. But as good seeds are produced freely in Florida, these may be collected by hand from natural growth. Usually some seeds may be obtained as early as June in the latitude of Gainesville. If seeds are scattered on plowed land not later than July, they germinate quickly and develop good strong plants which may be pastured some the first winter. Root clumps taken up about June may be divided and reset at distinct intervals where its growth is to be encouraged. In a few weeks these plants will begin to seed and, if conditions are favorable, the stand will quickly thicken thru volunteers from its own seed. This grass has not been handled as a cultivated crop in this country, but owing to its vigorous growth and resistance to cold it holds some promise, and on low, wet, waste lands its growth should be encouraged.

BAHIA GRASS**

This grass is related botanically to Dallis and Vasey grasses

**Paspalum larranagai*.

***Paspalum notatum*.

and is a native to Brazil. It was first introduced into this country by the United States Department of Agriculture in March, 1913, thru a German seed house at Erfurt. In 1914 the Department made another importation of the seed, this time obtaining it from Pirapora, Minas Geraes, Brazil. It is regarded as a valuable pasture grass in parts of South America, Western Cuba and other sections of the West Indies.

PASTURE GRASS

Bahia grass is essentially a pasture grass, growing low on the ground and spreading slowly by means of thick, scaly, rooting stems that grow on or just under the surface of the soil. From these stems a remarkably dense, matted, rooting system is developed and the upper stratum of soil is permeated to a depth of several inches by innumerable, small, fibrous roots. This remarkable root system enables it to withstand much heavy grazing. Its persistent, perennial habits make it a permanent pasture where it is once established, tho its green growth is very susceptible to injury from cold. Among the new grasses tried out in Florida during the past 10 or 15 years, there are none more promising than Bahia grass for pasture purposes.

PROPAGATION

Bahia grass propagates from the seed as readily as from small portions of the root. For the initial planting, small portions of the rooted plant are probably preferable, especially as the seeds are available only in limited quantities.

Its growth at the Florida Experiment Station, indicates persistent habits, and a tendency to spread slowly but constantly after it once gets a start. Cattle are fond of it and graze it close to the ground. It grows with vigor on moist soils, while it makes relatively good growth on land of a rather dry sandy nature; and here, where there are few other grasses found to thrive, it promises to have special value.

RESCUE GRASS*

This grass is said to be a native of Argentina. It is essentially a cool weather grass and makes its growth in Florida during the winter, disappearing early with the advent of hot weather. The plants grow to a height of from one to four feet and bear loose, drooping panicles, which in a general way resemble those of oats. A good, rich soil is required and it should be prepared

**Bromus unioloides*.

as for oats. Seeding should be done in late September or in October at the rate of 30 or 40 pounds of seed to the acre.

SELF SEEDING HABITS

It can be grazed during late winter and early spring, and, if the animals are removed in time to permit seeding, it will reseed the ground and provide for another crop the following season.

Annual plowing is essential to its continued success. It is advisable to follow Rescue grass with some summer crop, such as cowpeas which may be grown and removed from the ground between the ripening of the seeds in spring and the germination of the seeds in fall. In preparing for the summer crop the ground is plowed about four or five inches deep, turning the seeds under. The seeds lie dormant during summer but sprout with the coming of cool weather.

USED SIMILARLY TO OATS

Rescue grass occupies the same general role on the farm as does oats, but, even where it thrives best, it is questionable whether it will ever be able to compete with oats. In some few instances it has, however, proved quite successful on good clay lands in the northern and western sections of Florida.

NATIVE RANGE GRASSES

One of the most urgent needs of the range cattle business is a more nearly adequate supply of grazing material during winter. There is, as a rule, a large supply of feed in summer and a serious shortage thruout fall, winter and spring. Under these conditions it is almost impossible to maintain an equilibrium between the food supply and the size of the herd.

The most important range plants include the wire grasses, broom sedge grasses, blanket grasses, Maiden cane, Carpet grass, Giant Carpet grass, Joint grass, and Blue Maiden cane, and many others of relatively less importance. Most of these provide good grazing for a few weeks during their early growth, but soon become fibrous and unpalatable and greatly reduced in feeding value. The accumulated surplus from the rapid growing summer period becomes woody and does not afford good winter grazing. As a result, much of it is burned during winter. The burning of grass lands is often condemned, but in practical range management it frequently seems to be a necessary measure. It is best, however, to avoid burning whenever possible. Aside from the injury to the soil, it discourages the growth of Carpet

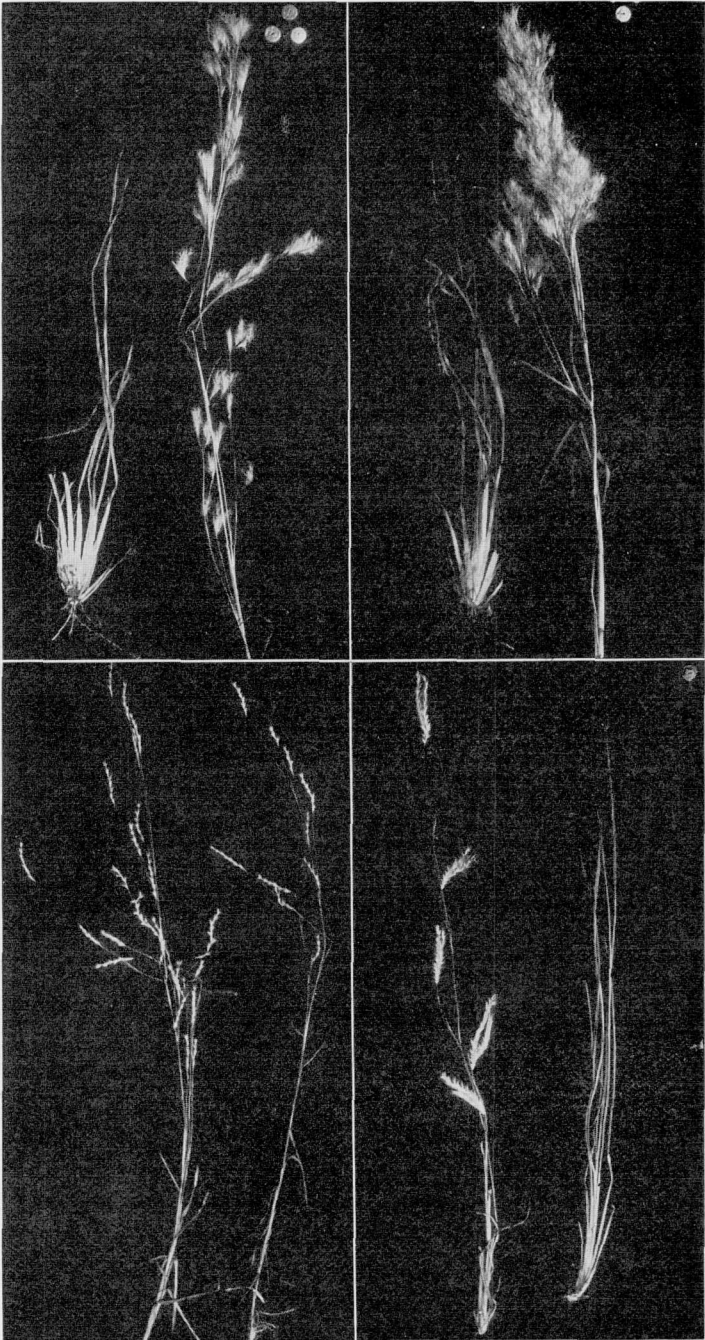


Fig. 13—Species of broom sedge, important range grasses. Upper left, *Andropogon virginicus*; upper right, *A. glomeratus*; lower left, *A. scoparius*; lower right, *A. cabansii*

grass where it might otherwise grow. It also tends to perpetuate the wire grasses and other fibrous species.

RANGE IMPROVEMENT INVOLVES MANY PROBLEMS

The handling of range lands is a complex problem. Large areas of these lands are used by cattlemen who in turn do not own the land. As long as the land and cattle are held under separate ownership, the general fencing of range lands cannot be expected. For this reason the conversion of suitable lands from wire grasses to Carpet grass, as mentioned on another page of this bulletin*, will not apply generally to range conditions; since that method demands for its success control of the number of animals and implies fencing of the lands. The average area of range land in Florida required to support an adult animal is estimated at ten acres.

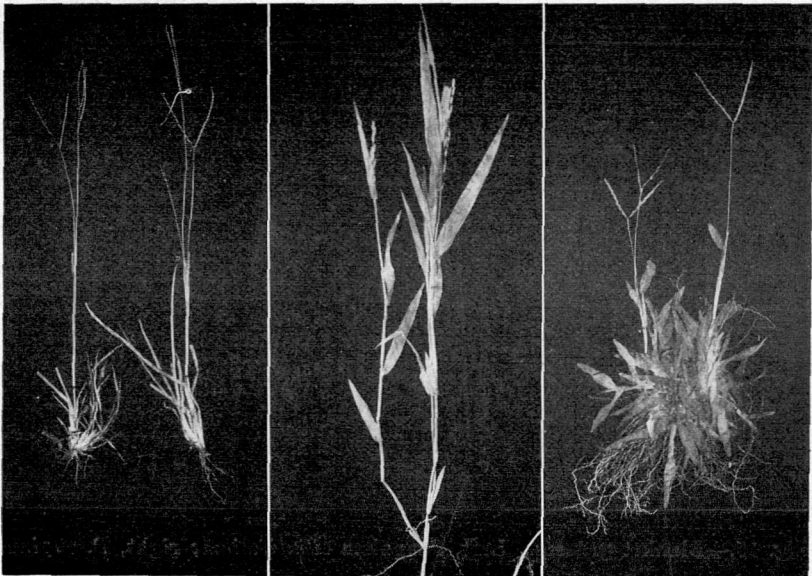


Fig. 14.—Other important range grasses. Left, Carpet grass; center, Blue Maiden grass; right, Giant Carpet grass

*See under Carpet grass, page 28.

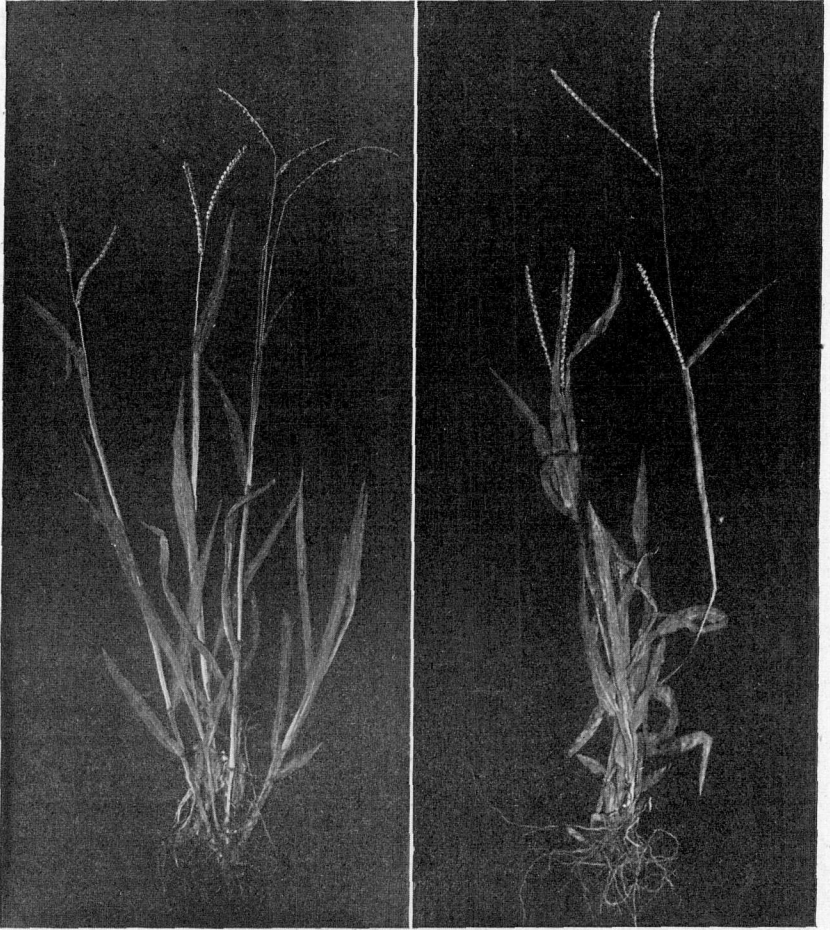


Fig. 15.—Blanket grasses. Left, *Paspalum ciliatifolium*; right, *P. supinum*

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