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G. B. Walker

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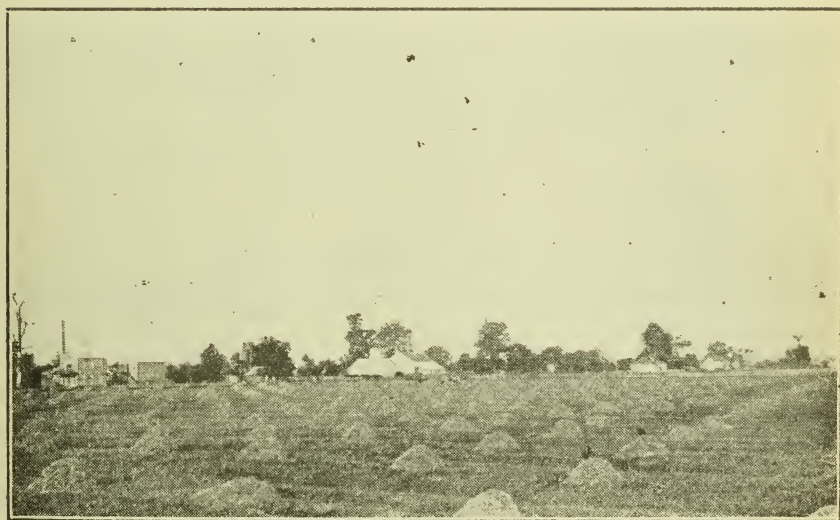
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Alfalfa in the Delta

Delta Branch Station

by

G. B. Walker.



Curing Alfalfa Hay in Small Cocks

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* In cooperation Bureau of Animal Industry, U. S. Department of Agriculture

Alfalfa in the Delta

By

G. B. WALKER

Alfalfa is decidedly the most valuable of all forage crops for the Mississippi Delta region, and, next to cotton, is possibly the most profitable and most important of all crops grown in this region. It is fast growing in favor, and will in a very short time be found growing on a large per cent of the cotton plantations in the Yazoo-Mississippi Delta. No other feed crop is as safely and as cheaply grown, nor is there any other grown with as much satisfaction to the planter or is relished by so many classes of livestock. There is an important place for it on every plantation and sufficient acreage should be grown in this crop to abundantly supply both hay and pasture for all livestock, even the very poorest season.

Recognizing its great value and its wonderful possibility in helping to bring about a better system of agriculture on the cotton plantations of this region, this Station, in 1915, began some experiments with a view of finding its soil requirements and the varieties best suited to this region.

This bulletin is prepared with a view of giving results of tests and observations made and to answering many of the more important questions that come to this Station almost daily.

WHERE TO PLANT ALFALFA

It is to be remembered that alfalfa is a very deep-rooted plant, sending its roots six to ten feet into the ground, when conditions are favorable. Therefore, for best development of this plant it must have a deep, porous, and a well-drained soil. These conditions are all obtainable in the Delta, with drainage being the controlling factor. No planter should attempt to grow alfalfa until he can provide a well drained soil. It makes little difference whether the land be loam or buckshot if it is well-drained, reasonably free of weed and grass seeds, and otherwise in good tilth. It was once thought that alfalfa could never be grown successfully on the loam soils of the Delta, but this idea has long been exploded. It is more or less true that the buckshot, or fine clay soils, when well drained, are our best alfalfa soils, but when well inoculated and freed of grasses, our loam soils produce most excellent crops of alfalfa. There are loam soils on the Delta Station farm that have produced more than five tons of hay per acre per season, and retained the stand for four years, which is as long as anyone should wish a stand to hold in this section, where cotton produces so well following alfalfa.

SHOULD DELTA LANDS BE FERTILIZED OR LIMED FOR ALFALFA?

With a view of determining whether or not lime or phosphate would increase alfalfa yields on loam soil, the work described in Table I was started in the fall of 1914, and records kept during seasons of 1915, 1916, 1917, and 1918, but on account of part of records for 1918 being questionable, none of the records for that year are included in this report.

FERTILIZER WORK WITH ALFALFA, AT DELTA STATION

1915, 1916, 1917—AVERAGE OF TWO SERIES

TABLE NO. I

Treatment per Acre	Average Pounds Field Cured Hay per Acre from Two Series			3 Years Average	Increase due to Fertilizer
	1915	1916	1917		
Untreated - - - - -	8477	11898	8196	9523	0
1000 Lbs. Basic Slag-----	8850	13349	9209	10469	946
2000 Lbs. Rock Phosphate-----	8584	12937	9082	10201	678
8000 Lbs. Lime Stone-----	8893	13010	9523	10475	952
8000 Lbs. LimeSt. & 1000 Lbs. Slag	10186	13655	9709	11150	1627
8000lb LimeSt & 2000lb Phos. *--	9356	12830	9421	10535	1012
* Raw Rock Phosphate					

The materials were carefully weighed and applied in July of 1914, at the time of preparing the land. Duplicate plots of all treatments and checks were used.

The land used was the poorest and most uniform loam soil that could be found on the Station farm. As far back as there is any record the land has been cropped in cotton, and it is very probable that it has grown as many as fifty consecutive cotton crops.

The seed bed was made almost perfect, and seed planted with wheel barrow seeder on Aug. 7th, 1914. An excellent stand was secured on all plots.

From a study of Table I it will be noted that the average yearly increase due to 1000 pounds of Basic Slag per acre was 946 pounds of field-cured hay; from 2000 pounds of Raw Rock Phosphate it was 678 pounds; from 8000 pounds of Lime Stone it was 952 pounds; from 8000 pounds of Lime Stone, plus 1000 pounds of Basic Slag, it was 1627 pounds; and from 8000 pounds of Lime Stone plus 2000 pounds of Raw Rock Phosphate it was 1012 pounds of hay.

When used separately 1000 pounds of Basic Slag and 8000 pounds of Lime Stone gave practically the same increase; while 2000 pounds of Raw Rock Phosphate gave only about two-thirds as much increase. When Lime Stone was combined with Basic Slag, a very much larger increase was gotten, but when combined with Rock Phosphate very little greater increase was gotten than when the lime was used alone.

While all the applications gave substantial increases, when the cost of material, cost of transportation, and cost of applying are all taken into consideration, it seems the most practical and at the same time the most profitable application was 1,000 pounds of Basic Slag per acre. Even the advisability of this application will depend upon price of alfalfa hay and distance of land to be treated from railroad station. It will also be noted that even the check plots, which were on very thin loam lands, yielded an average of more than four and three-fourths tons of hay per acre per year.

PREPARING SEED BED

Too much stress cannot be laid on the matter of seed bed for alfalfa. With this crop, as with all other farm crops, much depends upon getting a good stand, and good stands are gotten only when the seed bed is properly prepared.

An excellent way to prepare for alfalfa is to break the land thoroughly in winter or early spring, disc and harrow thoroughly, and plant to peas broadcast as soon as danger of frost is over, using three bushels of seed per acre. As soon as peas will permit, cut clean for hay, and as soon as hay is removed, disc and harrow land thoroughly but shallow. A seed bed to be nearest ideal should be thoroughly worked and firmed with only enough loose soil to cover seed to depth of about one inch. If alfalfa is to be planted in the spring, a well-tilled cotton field with land disced and harrowed crosswise of rows sufficient to level land, affords an excellent seed bed.

WHEN TO PLANT.

By far the best time to plant alfalfa in the Mississippi Delta is in the fall. Late August to October first is usually safest. Spring planting, un-

less the land is very free from grass and weed seeds, and is thoroughly inoculated, is very uncertain. If it becomes necessary to plant in the spring, it should be done early in March or as soon as danger of hard freezing is past.

HOW MUCH SEED TO USE

When all conditions that enter into securing a good stand are ideal, it takes only a very few pounds of seed per acre to give a good stand, but we seldom, if ever, get all conditions ideal, and it is only good business to stay on the safe side and use enough seed to get a good stand under average to bad conditions. Twenty pounds per acre is generally conceded to be about the right amount, and the Station advises that at least twenty pounds be used. The best insurance against grass and weeds is a thick stand of alfalfa. Grasses get a start in vacant places or skips, and spread rapidly.

HOW TO PLANT

If one has acreage to justify it, a drill should be used. It places most of the seed at proper depth and insures a more uniform stand. If a less expensive seeder must be used the wheel barrow seeder should be used. In no

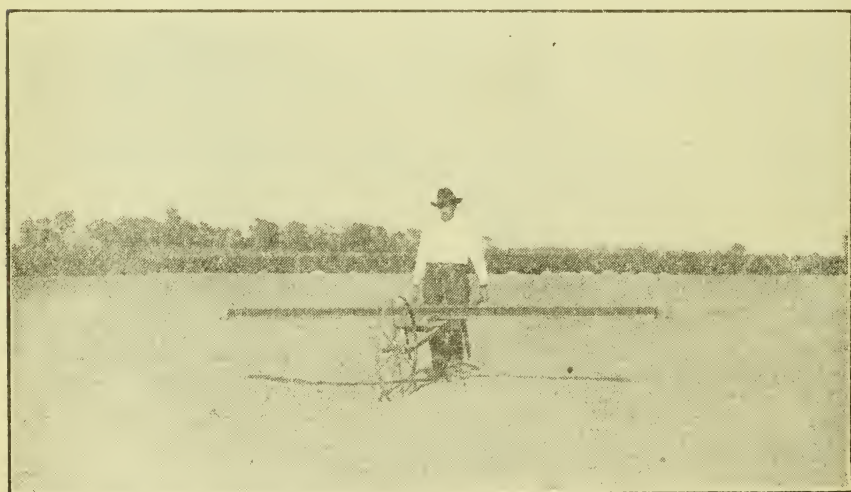


Fig. 1. Good Type, Low Priced Seeder.

case should the whirlwind type of seeder be used. In all cases, half the seed should be planted with seeder going in one direction and half when going at a right angle to direction of first seeding. This insures a more uniform distribution of seed, and consequently a more perfect stand.



Fig. No. 2—Good method covering alfalfa seed behind wheelbarrow seeder.

THE VARIETY TO BE PLANTED.

There seems to be almost as much difference in yielding ability of the different varieties and strains of alfalfa as there is in that of other farm crops, and the planter should, when possible, plant the variety that has been proven the best yielder under conditions similar to his own.

In 1916 this Station planted thirteen varieties and strains on fifty-two plots of one-seventh acre each, with a view to finding the variety or strain best suited to Delta conditions. This test was planted April 1st, 1916, on fairly well-drained buckshot land. Good stands were secured on most of the plots. There were four plots planted to each of the varieties, but they were in different parts of the field. In order to eliminate as much as possible any difference there might have been in stands, records were kept only on the three plots with best stands of each variety. Table No. 2 gives names of varieties with showing made by each, over a period of three years.

ALFALFA VARIETY WORK AT DELTA STATION—1916, 1917, 1918.

1-7 ACRE PLOTS (3 SERIES)

TABLE NO. II

VARIETY	Yield in Pounds Hay per plot (Field-Cured)			AVERAGE		Increase Over Poorest Yield
	1916	1917	1918	per Plot	per Acre	
Common - - - - -	915	1276	1095	1129	7903	
Grimm No. 240 - - - - -	1244	1310	1277	1277	8939	1036
Disco No. 19 A - - - - -	1330	1316	1323	1323	9261	1336
Baltic No. 204 - - - - -	1087	1480	1028	1198	8386	483
Disco No. 32 C - - - - -	1239	1550	1392	1394	9758	1855
Disco No. 28 - - - - -	1187	1726	1456	1456	10192	2289
Disco No. 79 - - - - -	1114	1520	1317	1317	9219	1316
Disco No. 36 - - - - -	1233	1520	1406	1386	9702	1799
Disco No. 37 - - - - -	1222	1494	1408	1375	9625	1722
Turkestan - - - - -	1015	1414	1213	1214	8498	595
Cossack - - - - -	1056	1240	1148	1148	8036	133
Common S. D. No. 12 - - - - -	1208	1560	1434	1401	9807	1904
Common U. S. D. A. - - - - -	1149	1306	1227	1227	8587	684

From a study of Table No. 2 it will be noted that Disco No. 28 and Common South Dakota No. 12, both pedigreed strains of common, or non-hardy varieties, have outyielded the recognized hardy varieties, such as Grimm and Cossack. The climate of the Yazoo-Mississippi Delta is of such a nature as to render the virtue of the so-called hardy varieties of little or no value here. Our climate is mild, and all varieties when well rooted seem to be able to stand our most severe winters. Delta planters are interested in the variety that will make the most hay, and judging from the above test, the pedigreed strains of Common are the varieties they should use. These varieties not only stand our winters well but yield more hay, and the seed usually come much cheaper than most of the highly exploited hardy strains of the North and North-West. It will be noted that Disco No. 28 made an average annual yield of 10,192 pounds of field-cured hay per acre, an in-

crease of 2289 lbs. over lowest yielding strain, while Common S.D. 12, yielded 9807 lbs.; an increase of 1904 lbs. over lowest yielder. It is interesting to note that the lowest yielding and the highest yielding plats were both planted with seed from common alfalfa, one of nondescript breeding and the other a pedigreed strain of known value—proving that with alfalfa as with most other farm crops it pays to plant seed of pedigreed strains. In this case the gain in favor of a pedigreed strain was worth at least \$20.00 per acre per year, or \$60.00 for the three years, while the increase in cost of seed was probably \$3.00 to \$4.00 per acre. Even with an increase of half that resulting in this test, a like investment in pedigreed seed is worth while.

INOCULATION

Alfalfa, like all other legumes, requires for its proper development certain species of bacteria which work upon its roots and gather nitrogen for it from the atmosphere. If these bacteria are not present in the soil, they must be supplied before the alfalfa can make its best development. In the majority of cases where alfalfa is sown for the first time, particularly in the case of our loam soils, it will need to be inoculated by some artificial means. There are several ways in which this can be done, but the most practical way is to broadcast and harrow in, before sowing the seed, some soil from a good alfalfa field where the bacteria are known to exist. At least three bushels of well pulverized soil per acre should be used. The soil should be secured with caution to avoid getting bad grass seed. Care should also be taken to get soil from a field where the alfalfa is healthy, to avoid introducing diseases in the new field. Soil for inoculating should be exposed to sunlight very little. It should be distributed and harrowed in with as little delay as possible. As a rule, the buckshot lands of the Delta do not require inoculation, but when being seeded to alfalfa for the first time, and when soil can be had from a nearby field at little expense, it will pay to inoculate such land, in that it usually insures an earlier catch and a heavier first cutting.

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WHEN TO CUT FOR HAY

Alfalfa should usually be cut for hay whenever the new shoots at the crown are well started. This is always a safe guide for the early cutting, but late in the season a dry year, alfalfa is apt to turn yellow and begin shedding leaves before the shoots appear. In such case it should be cut before the shoots appear. In no case should alfalfa be allowed to remain uncut after it ceases to make growth.

ALFALFA AS A PASTURE CROP

While alfalfa is primarily a hay plant, there are few strictly pasture plants that afford more excellent pasture for all farm animals than does alfalfa. It is especially good for young, growing animals.

Alfalfa should be grazed very lightly, if at all, the first year. Neither should it be grazed when the land is wet, as tramping at such times injures the plant. It should not be used as a permanent pasture, but as a supplement to other pastures. It is well to pasture a few days after each cutting with such animals as horses and cows, to pick up small lots of hay that have fallen from wagons in hauling, and otherwise escaped the harvesting machinery. Many stands are injured by small bunches of hay being allowed to remain in field after harvesting, which smother out plants covered by them. This can be prevented by allowing cattle or horses to glean the fields after each cutting.

Alfalfa makes an excellent pasture for the dairy cow, but caution should be exercised and the cow allowed to graze only when the plants are dry. Grazing when alfalfa is wet is apt to cause bloating.

As a pasture for hogs alfalfa has few, if any equals. Hogs seem to make better use of it than any other class of livestock.

This Station, in Bulletin No. 177, reports some very remarkable results from pasturing hogs on alfalfa. In tests reported in this Bulletin, it appears that where sixty pound pigs were allowed to graze alfalfa without receiving any grain feed at all they paid \$3.71 per head for ninety days grazing, or a little more than four cents per head per day, when pork is worth seven cents per pound. When a liberal ration of corn was fed in addition, the alfalfa pasture was worth five and three-fourths cents per head per day. It was also found in these tests, but not stated in Bulletin No. 177, that an average Delta Alfalfa meadow could afford grazing for ten head of sixty to one hundred pound pigs per acre, without materially affecting its hay yield. To be exact, during 1915, twelve acres of only average alfalfa furnished constant grazing during the entire summer for one hundred-twenty head of pigs weighing from 50 to 200 lbs., and then yielded an average of 3.65 tons per acre of field-cured hay.

An excellent method of grazing hogs on alfalfa is to divide the meadow into at least three fields, and arrange to cut one field at a time, at intervals of ten to twelve days, and let the pigs follow behind the harvesting. In this way the pigs are on the various fields only one-third of the time. This practice also affords tender sprouts at all times and a uniform quality of grazing, and at the same time keeps pigs from tramping down plants after they have grown tall, and ready to be cut for hay. A better grade of hay is also insured, and the alfalfa also has a better chance in battle for existence with grass and weeds. One of the big problems in grazing alfalfa with hogs is to keep grasses from choking out the alfalfa. If hogs are allowed to graze

on one field constantly they keep the alfalfa down, and leave the grasses grow.

When grazing alfalfa, hogs should have rings in their noses, or else be kept off the alfalfa altogether when the land is wet. It has been observed that hogs do little rooting in alfalfa meadows except when the land is wet, or coco grass is present.

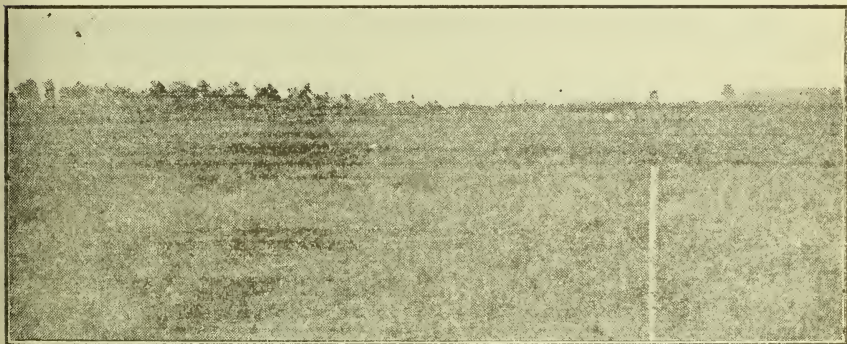


Fig. No. 3—Nothing better for hog grazing than alfalfa.

ALFALFA A CROP FOR COCO LANDS

If there is one plant that will thrive and make a profitable crop on buckshot land badly infected with coco grass, that plant is alfalfa. If a very thick stand is secured, it will usually hold for two or three years. The coco grass sometimes, I might say usually, makes itself very much felt during the late summer, and materially lessens the yield from fourth and fifth cuttings, but the first three cuttings are usually heavy enough to make the crop profitable. The next spring the alfalfa gets an early start, and usually holds its own for three cuttings. It must be remembered that only the perfectly thick stands of alfalfa can win on badly infested coco land. It is not at all advisable to graze such meadows with hogs, particularly if the ground is wet, as they will destroy alfalfa rooting for coco nuts.

Alfalfa will do coco grass no harm. It simply wins by being earlier and a more vigorous grower in the spring and early summer.

GETTING GRASS OUT OF ALFALFA

After grass has gotten a hold in an alfalfa meadow, there is, so far as the writer knows, no satisfactory way of getting it out. There are a number of alfalfa cultivators recommended, but most of them tend to do about as much harm to the alfalfa plants as they do to the grass. The greatest enemy to grass in an alfalfa meadow is a perfect stand of alfalfa. When the stand becomes thin enough to allow grasses to grow at all seasons, it is usually cheapest to plow up and re-seed—or better, plant alfalfa in another field and plow up the old field and follow with cotton for two or three years when the land can be seeded to alfalfa again with safety.

ALFALFA IN THE CROP ROTATION

In planning a rotation system for Delta plantations there is no crop that will give better results than alfalfa. It is easily grown, improves the



Fig. No. 4—Cotton pays better than any other crop following alfalfa.

soil, makes profitable crops, will grow on almost any type of soil that is well drained, and one planting will stand about as long as is necessary to bring the average soil to a good state of fertility. One could hardly wish for a more ideal crop for rotating with cotton. In a rotating experiment at this Station, after growing alfalfa on worn buckshot land for three years, it increased the cotton yield over a check plat that had been planted continuously in cotton, \$76.00 per acre the first year cotton followed alfalfa. The second and third years following the alfalfa the increases over check plats were very marked.

Summary

Alfalfa may be successfully grown on almost any type of soil in the Yazoo-Mississippi Delta, provided it is well drained and free of grass.

Every plantation should grow at least one-half acre of alfalfa for each one thousand pounds of animals kept. More acres would be better.

Alfalfa makes large yields of the very best hay. It is relished by all classes of livestock.

Alfalfa affords a most excellent pasture for hogs and other growing animals. It should not be grazed while the ground is wet, particularly if coco grass is present.

Few plants make as profitable crop on badly infested coco land as does alfalfa.

Seed beds for alfalfa should be thoroughly prepared, but well-firmed before planting.

For alfalfa, it will usually pay to treat loam soils with lime or slag, if the haul is short. 80,000 pounds of ground limestone and 1,000 pounds of Basic Slag per acre have proven about equal in effectiveness.

It is always advisable to inoculate land that has not previously grown alfalfa. A good method of inoculating is spreading 300 or 400 pounds of soil per acre from an established alfalfa field over land to be seeded.

Use 20 pounds of seed per acre.

A disc drill should be used when possible. If a cheaper seeder must be

used, the wheel barrow seeder is to be preferred.

Plant varieties suited to Southern conditions. Pedigreed strains of common alfalfa are to be preferred.

A perfect stand of alfalfa means much in yield and in fighting grasses. Grasses have little chance to grow where the stand of alfalfa is perfect.

In harvesting alfalfa make sure that the field is harvested clean. Small lots of hay left on alfalfa meadows have ruined many a good stand. They smother out the alfalfa and allow grasses to grow.

Alfalfa works well into a rotation system for the cotton plantation. It is a wonderful soil improver.