Mississippi Agricultural Experiment Station.

BULLETIN No. 129.

SUGAR CANE FOR SYRUP MAKING.

By E. B. FERRIS.

Fig. 1.—Syrup House.

AGRICULTURAL COLLEGE, MISSISSIPPI.

December, 1909.

Tucker Printing House, Jackson, Miss.
Sir:—

I submit herewith manuscript for bulletin on Sugar Cane for Syrup Making, being somewhat a popular treatise based on practical experience and the results of eight years’ work with cane at this station.

Respectfully,

E. B. Ferris,
Assistant Director.

W. L. Hutchinson, Director,
Mississippi Experiment Station.
SUGAR CANE FOR SYRUP MAKING.

E. B. Ferris.

Introduction.—With the appearance of the cotton boll weevil in Mississippi the farmers will be on the alert for other crops to substitute for cotton and sugar cane grown for syrup will be one of these crops. It is admirably suited to the soils and climate of South Mississippi and may be grown for home consumption over almost the entire state. In South Mississippi it could be made a money crop, for the sandy-loam soils here produce a syrup of unsurpassed color and flavor, far superior to that from cane grown on the stiffier lands of this state and Louisiana. At present, however, the syrup made here by numerous individual growers of cane is so lacking in uniformity and so apt to prove disappointing to the trade that it is really difficult to dispose of our present acreage. However, we know from experience that there is a demand for this syrup in great quantity if the growers of cane can only be taught the importance of thoroughly cleaning the juices, of cooking to a standard density, and of immediately sealing the syrup in a package that the trade demands.

Soils suited to sugar cane.—Sugar cane is a gross feeder and requires a great quantity of water during its growing period. A yield of 45 tons of cane to the acre would require, according to Dr. Stubbs over 56 inches of rainfall. Cane, therefore, should be planted only on the lands full of organic matter or humus for holding water and well supplied either naturally or artificially with plant food elements. It occupies the land at least two and sometimes three years from a single planting, in practice there is no way to restore the humus during this time, and withal is such a nitrogen consumer that it would be well never to plant the crop except on land that has just grown a crop of cowpeas or velvet beans.

History.—Sugar cane belongs to the large family of grasses and is said to have been first grown in China and India. It was introduced into this country by the planters around New Orleans and is extensively grown in Louisiana for making both syrup and sugar. It does not form seed in this climate but in countries farther south
some varieties throw out seed stems when from twelve to thirteen months old and reach maturity some three months later. However, the seeds from sugar cane germinate very poorly and it has been only in recent years that they have been used at all as a means of propagation and even now they are only used for introducing new varieties. In this and in all tropical countries, even, cane is propagated commercially by planting the stalks. A sugar cane stalk is made up of a series of nodes and internodes and at each node or joint is a bud which sprouts and forms a stalk. These stalks sucker or tiller freely so that from every original one from three to ten stalks should be found at the harvest and in tropical countries many more than this.

**Saving seed cane.**—Seed cane should be allowed to grow as late as possible in the fall consistent with danger from frost. In the latitude of McNeill we seldom have a frost that will injure the buds before the tenth of November and frequently not until much later than this. As a rule the oldest stubble cane should for several reasons be used for seed; cutting cane very long before frost causes it to sprout and these sprouts always get killed injuring the stand for the succeeding year; the greater part of the seed cane is saved by windrowing in field between old rows of cane and in covering this the stubbles are badly injured; the stubble cane being grown after the land has become somewhat impoverished is nearly always shorter jointed and gives more eyes per running foot than the plant cane, besides it is more woody and does not yield as much juice.

In practice the seed cane is either planted in the fall or is protected by windrowing through the winter and planted in early spring. The best results at McNeill have been had with fall planting. It is a laborious job to handle seed cane and a lot of work is saved by fall planting; the canes sprout quicker in the spring and get an advantage in this way; besides our experience has been that fewer eyes are lost through the winter, and none are lost by breaking as is always the case with spring planting. For fall planting the ground should be thoroughly prepared and rows opened 4½ or 5 feet apart with middle burster or with two furrows from a turn plow, the seed canes should be dropped in this furrow and covered with from three to four inches of dirt. If the weather is dry a heavy roller should follow the covering of the cane to bring moisture to it and prevent “dry rot.” Where natural drainage is good as is the case on the hill lands of this section dry rot is the greatest destroyer of seed. In poorly drained soils “wet rot” will be equally destructive and under such conditions it
would be best in case of fall planting to first throw up beds nine or ten feet wide and plant two rows of cane to each bed.

Where spring planting is done the seed cane should be cut in the fall and promptly piled shingle fashion between the old rows of cane and immediately covered by running furrows with turn plow on either side, throwing the dirt on the cane and following at once with hoes to complete the covering. It is best to do this while the weather is damp or else to pour water over the windrowed cane. Prompt covering with dirt keeps out the air, prevents the drying out of the cane, and will save much loss from dry rot.

**Quantity of seed required to plant an acre.**—A question frequently asked on farmers institute work and through correspondence is the quantity of seed required to plant an acre. We will assume that standard rows will be five feet apart. This would give forty-two rows 210 feet long to the acre and would require 8,820 feet of cane. Assuming that each stalk will be four feet long, it would require 2,205, or, if we double them in the drill 4,410 stalks. Each of these stalks will weigh about two pounds giving a total of about four and one-half tons to plant an acre. On land thoroughly prepared and carefully planted in the fall we feel sure that a good stand could be obtained by half lapping the cane in the drills and using about 3,500 stalks to the acre. This is especially true if care is taken in the spring to remove the dirt from the cane rows and allow every opportunity for it to sprout promptly.

**Should the stalks be cut?**—In planting stalks of cane it is generally supposed that they should be cut into short pieces, the popular impression being that otherwise the stalks that sprout first will draw strength from the eyes unsprouted and prevent them coming up at all. This argument is fallacious according to the results of the Louisiana Experiment Station which results seem to have been borne out here by practical experience. Each eye or bud on the stalk is independent of the other and the cutting of the cane, especially in fall planting, only serves to introduce fermentation and decay. If the seed stalks are straight (which is seldom the case) it is best not to cut them at all, but if they are crooked they should be cut in two or more pieces so as to make them lie flat in the furrow and lessen the danger of pulling them up in cultivation or of covering a part of the stalk too deep and another part too shallow.

**What part of the stalk to plant.**—In ordinary practice the entire stalk of cane is planted, but a considerable economy might be prac-
ticed by using the lower two-thirds of the stalk for grinding and the upper one-third for planting. The upper part of the stalk has considerably less sugar in it than the lower portion and experience has shown that it is as good if not better for seed than the more mature parts. This station has experimented with saving the tops for seed with good success where as many as five or six mature joints were left with the tops but with poor success where only one or two joints were left as has been recommended by enthusiasts on this subject.

Varieties.—In recent years a number of varieties of cane have been introduced into this country from all over the cane-producing world and the Louisiana Sugar Station has tested possibly hundreds of them at New Orleans. They were kind enough to give us a number of these varieties in small lots but we were only successful in getting two kinds to sprout. We have now growing on the station, purple, ribbon, Japanese, and the two new varieties referred to, D. 74 and D. 95. So far we have not found the ordinary purple cane to be inferior to the rest, and as this is the kind most widely distributed in this state, we would recommend a continuance of its use, introducing new kinds only in an experimental way. In comparative tests here the ribbon and purple canes grown under like conditions have yielded equally well. The Japanese cane is not regarded as being so good as the larger canes for syrup, though on account of its extreme hardiness it might be better for more northern latitudes. The stalks of this variety are very small besides being quite hard and woody, making it expensive to prepare for grinding as well as difficult to grind. As compared to an extraction of 72% with the purple cane we got only 60% with Japanese, there was from 15% to 25% less saccharine matter in the juice, and the small stalks were extremely difficult to grind. This Japanese cane seems better suited for forage than for syrup here and we have a number of tests in progress with it in feeding hogs and cattle.

Fertilizers.—Seed cane should have a light application of fertilizer at the time it is planted for the reason that around each joint the mother cane puts forth roots and if these roots are promptly fed the stalks of young cane will grow off much more vigorously. Aside from this, it is best to apply the bulk of the fertilizer to both plant and stubble cane in the spring after the stand is about complete and the dirt ready to be thrown back to the cane rows. This fertilizer should be applied on both sides of the cane rows and also scattered across this row. A number of tests have been conducted here to show the
effects of different plant food materials on the yields of cane, also
to show the advantage of one or more applications of a given fertilizer.
These tests while not altogether conclusive lead us to advise under
average conditions making a single application of the fertilizer in
the spring and not a part then and the balance later. This does not
have reference to the small quantity that should be put under plant
cane to give it a more vigorous start.

Results here so far have shown no material increase in yield due
to the presence of potash salts in a fertilizer. On good land these

CORNER OF FERTILIZER TEST PLATS.

results show that from 1000 to 1500 pounds may be used profitably
per acre and that under average conditions this should be composed
of about equal parts acid phosphate and cottonseed meal or its equiv-
alent of some other carrier of organic nitrogen. Sugar cane should
always follow a leguminous crop and be planted on land well supplied
with humus. On such land the supply of nitrogen the first year may
be considerably reduced, a fertilizer made of two parts acid phosphate
and one part cottonseed meal answering admirably. On the stubble
cane of the year following the supply of nitrogen should be increased
by using equal parts of meal and phosphate and in case a second year’s
stubble is grown it would be well to use a mixture of two parts cotton-
seed meal and one part of acid phosphate, buying none but the best
grades of each substance. In saying cottonseed meal we mean always that should the price of this material not justify its use, dried blood, tankage, or fish scrap, furnishing an equal number of pounds of nitrogen, may be substituted for it.

The following table gives the results of two years work here with fertilizers under plant and stubble cane:

### Results with Fertilizers under Sugar Cane.

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<td>210</td>
<td>208</td>
<td>90</td>
<td>3660</td>
<td>58,560</td>
<td>29.3</td>
<td>16.9 Purple Cane.</td>
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<td>208</td>
<td>90</td>
<td>3570</td>
<td>57,120</td>
<td>28.6</td>
<td>16.7 Ribbon Cane.</td>
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<td>454</td>
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<td>34.7</td>
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<td>416</td>
<td>180</td>
<td>4280</td>
<td>68,480</td>
<td>3.42</td>
<td>21.0 One-half applied in spring and one-half in July.</td>
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<td>416</td>
<td>180</td>
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<td>70,400</td>
<td>35.2</td>
<td>20.4</td>
</tr>
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<td>208</td>
<td>49</td>
<td>4110</td>
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<td>32.9</td>
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**Cultivation.**—After the cane has been planted and is ready to sprout in the spring it is very important to remove all surplus dirt from above it so as to allow the young sprouts to come through. This is done by barring off the rows with turn plows and removing dirt above the cane with hoes. The stubble cane should be treated pretty much the same way and the dirt removed from around the stubbles with hoes or pronged forks, or better by a stubble digger. Experience
here has been that the stubbles will keep through the winter as well and possibly better by simply leaving them with no more dirt above than would naturally accumulate in cultivation. The Louisiana Experiment station recommends the burning of all fodder and other trash as early in the winter as possible. If any considerable area of stubble cane is to be cultivated it will pay to buy a stubble digger, a two-horse implement made by B. F. Avery & Sons and costing about $60.00. This implement is almost human in the way it works cane stubbles and it reduces the cost over hoes in the same proportion that the mowing machine does over the scythe.

With proper care in early spring the sprouts from both stubble and plant cane will quickly show above the ground and the dirt should not be thrown back to them until sprouting has been about completed. It is then that the fertilizer is applied and the dirt returned to the row after which cultivation should proceed as with other farm crops such as corn or cotton. Shallow cultivation is to be greatly preferred and for single horse work we have found nothing superior to the “Diverse” cultivator which is generally sold by the implement dealers in this territory. Cultivation should be frequent and shallow to keep down weeds and maintain a dust mulch for conserving moisture.

**Harvesting.**—In the fall the blades must be stripped from the cane, the tops removed, and the stalk severed at the surface of the ground. The implement used almost universally for this is the ordinary cane knife, a flat piece of steel on a suitable handle with a slight hook on the back for stripping. In the Louisiana cane fields the cane is stripped by two downward strokes with the back of the knife, the third lick removes the top, and the fourth severs the stalk at the ground, the entire operation being completed as the workman proceeds.

Mr. Wm. Howse, a farmer of Cairo, Ga., has invented a simple cane stripper made of two pieces of thin steel about 15 inches long by 1 inch wide and 1-16 inch thick, bent and flared at one end so as to slip over and fit around the stalk of cane and securely bradded at the other end to a handle three feet long. This stripper re-
moves the blades with a single downward stroke and has been found here to be a very useful implement. With this implement the blades are removed by one set of hands while others follow with knives and remove the tops and cut the stalks. Much work has been done on the perfection of a cane harvester but with poor success on account of the extreme difficulty of handling crooked canes by machinery.

Yields of cane.—The yields of cane vary widely of course with fertility of land, cultivation, seasons, etc., but on reasonably good land here a yield of as much as twenty tons of plant cane and fifteen tons of stubble cane per acre may reasonably be expected, a ton of cane corresponding roughly to twenty gallons of syrup. In 1907 this station had about twelve acres planted to cane, a good portion of which was on thin hill land that was very rolling. Of this entire acreage there was 1.1 acres of Japanese cane which yielded 34.7 tons and made 537 gallons of syrup, or 15.5 gallons to the ton. The remaining 10.9 acres of purple cane made 224 tons which gave 4,236 gallons of syrup or 18.9 gallons per ton. In 1908 Japanese cane made only 13.7 gallons of syrup to the ton while the purple cane made twenty-two. In 1907 when we used sulphur, lime and "Clariphos" for cleaning cane juices the syrup from Japanese was of good quality, but in 1908 when the use of these materials was discontinued the syrup had an extremely biting taste and would not sell in competition with syrup made from purple cane at the same time and in the same way. In fact, this syrup would not sell at all and we have practically all of it on hand now.

On the choicest spots in the cane field above mentioned the yields run up to above 800 gallons of syrup to the acre and on one plat of .43 acre we weighed up 49,735 pounds of cane which made 470 gallons of syrup, or at the rate of 1,092 gallons to the acre. This was on level hill land that had been fertilized with raw cotton seed, animal manures, and acid phosphate in 1905, planted to cabbage and again fertilized in 1906, purple cane planted in fall of 1906 and fertilized the following spring with equal parts acid phosphate and cottonseed meal at the rate of 500 lbs. of each to the acre. It is well to say that this cane began sprouting soon after Christmas, these sprouts were never killed, and a perfect stand was obtained in the very early spring, all conditions being favorable to its development through the year.

In this connection we would caution cane growers about the use of fresh animal manures under the crop. They will give an immense yield but have a tendency to give a salty, disagreeable taste to the syrup. If used they should be applied to some crop preceding the cane.
Handling cane.—Sugar cane is an extremely heavy crop and difficult to handle. It seldom remains erect until harvested, being nearly always blown down by winds in summer after which it grows in all sorts of shapes. When cut it is usually piled in heaps in every third row so that wagons may be driven through to pick it up. If loaded into an ordinary wagon body it is difficult to get to and troublesome to unload and in this state it is seldom grown in sufficient quan-

![SYRUP MAKING OUTFIT.](image)

tities to warrant the use of machinery for unloading, though if placed on ropes as it is loaded into the wagon body, simple hoisters may be improvised for lifting it out. In the absence of such a device or of
carts or wagons that will dump the cane, the station has found an
ordinary hay frame with side boards one foot high a very good means
of hauling so as to facilitate unloading, also it has found an ordinary
wood frame made to haul 4-foot wood much better than a wagon body
because the standards on such a frame may be removed and the cane
quickly unloaded by hand.

**Syrup making.**—The most of the cane manufactured in this state
is ground on 3-roller horse mills that are seldom screwed up as closely
as they should be and the percentage of the juice extracted is far below
what the cane contains. In examining several mills around the coun-
try the extraction was found to average below 60% but the same mills
by screwing up as closely as possible would give an extraction of 65%
or more. The Experiment Station has a 3-roller mill of 6 h. p. capacity
run by steam and gets a 72% extraction. A five roller mill would be
much better and ought to give an extraction of 75% or more. So,
as at present handled, a large part of the juice of the cane is left in the
bagasse and goes to waste.

The common method of making syrup by the average grower of
cane is about as follows: the juice runs from the mill through a burlap
bag into a barrel; from this it is usually removed in buckets and poured
into another barrel elevated above one end of the evaporator; from
this it runs through a faucet into the evaporator and the flow is so
regulated that constant streams of juice enter while equally constant
quantities of syrup come out at the opposite end, in the proportion
of about six to one; while the juice is going the circuit of the evapo-
erator it is being skimmed and cleaned and by the time it reaches the
sirup stage it is possible to have it fairly pure. An expert manipulator
may make a fair quality of syrup in this way, but the average man
will not clean the juice well and will either cook it too much when
the syrup will go to sugar or too little when it will ferment. On such
an apparatus it is impossible even for an expert with a saccharimeter
to get all the syrup cooked to the same gravity and this ought to be
the first and most important object in view.

A better quality of syrup may be made on just as simple an outfit
as the one described by substituting a pan or kettle for the evaporator
and by cooking a definite quantity of juice down to syrup, skimming
thoroughly, and finally testing the density of the syrup with a sac-
charimeter that may be bought for a few cents or even improvised
at home. One of the most successful syrup makers in this country
uses a pan that he made himself out of galvanized iron for the bottom
and poplar boards for sides. This pan is three feet wide, fifteen inches
deep, and 7½ feet long with a trough at one end for catching the skim-
mings. He cooks 150 gallons of juice at the time and gets from 22
to 30 gallons of syrup from it. The cooking is done with wood and
towards the end of the operation the fires are allowed to go down
so that when the proper density is reached the syrup may be removed
before its density can be materially increased. This party makes from
fifty to sixty gallons of syrup a day on the one pan which is about the
capacity of the ordinary evaporator. On the ordinary evaporator
there is about an hour between the time the juice enters and comes out
as syrup and on the pan described five hours. In the one the evapo-
ration takes place in shallow depths and in the other a large part of
the boiling is done in depths of from five to twelve inches. Naturally
less of the crystallizable sugar is converted into non-crystallizable
in the first process than in the second so that syrup of the same grav-
ity made on an evaporator is more likely to go to sugar than if
cooked in a kettle or pan.

**Cooking by steam.**—Really the best means of evaporating cane
juice is by steam and if any considerable acreage is ever devoted to
sugar cane in a given community, it will pay to have a public syrup
factory just as we now have public gins. Really the two could and
should be run in combination, using the same boiler and engine first
to operate the gin and later to grind the cane and evaporate the juice.
This has always been a feasible plan, but now since the advent of the
boll weevil it would seem especially so, for there will likely be no cotton
to gin after the fifteenth of October and we would not care to begin
syrup making earlier than this. With a boiler and engine at hand
it will be simple and inexpensive to install a cheap but effective system
for grinding cane and cooking syrup. The greatest trouble will be
in a lack of boiler capacity, since much more steam will be required
to cook syrup than is usually found necessary to run a small cotton
gin. In a specially designed syrup factory here we have a 40 h. p.
boiler with only an 8 h. p. engine and 6 h. p. mill; this will show the
relative quantities of steam required for grinding and for cooking.
Syrup factories might be run in connection with several other industries,
namely, ice plants, grist mills, canning factories, and even saw mills.
We know of one ice plant in the state that will put in a syrup making
outfit and of one syrup plant that saws lumber a part of the year.

**Arrangement of syrup house.**—The McNeill Experiment Station
has a complete syrup making plant designed and equipped by the
Blymyer Iron Works Co., of Cincinnati, Ohio. The machinery in this
plant cost about $2,200.00 and consists of a 40 h. p. boiler; 8 h. p. engine; 6 h. p. mill with cane and bagasse carriers; two 200-gallon juice tanks; 2 300-gallon defecators; 3 300-gallon settling tanks; 1 400-gallon evaporator; 1 boiler feed pump; 1 juice pump; 1 sulphur apparatus consisting of stove, cooling tank and sulphur box; together with all necessary pipe, steam coils, valves and other fittings for connecting all into a working unit. This machinery is housed in a building 26 feet wide and 72 feet long, with 22 foot side walls and an extreme height of thirty feet. This apparatus is so arranged that the boiler, engine and cane mill set on the ground floor; the juice tank is sunk so that the top of it is on a level with the ground floor. The juice is picked up from this tank by a rotary pump run by the same shaft which turns the cane mill and is pushed to the extreme height of the building where it enters the top of the sulphur box and flows back and forth over a series of super-imposed copper shelves coming intimately in contact with fumes from burning sulphur which enter this box from below and pass out at the top. This sulphur is burned in a small stove also set on the ground floor and the fumes are conducted through a two-inch pipe (surrounded by running water) into the sulphur box, the quantity of fumes being regulated by a steam jet which enters the escape pipe at the top of the sulphur box. After the juice is bleached it enters a second juice tank from which it is directed into one of the two defecators placed on what might be called the third floor of the building (the sulphur box is set on the joists.) These defecators are provided with steam coils and here the juice is heated and the blanket of impurities which rise to the top is brushed off into a trough extending entirely around it. Milk of lime is then added about to the point of neutrality as determined first with litmus paper and later by the eye and the cleaning continued by brushing off impurities which rise to the surface. After the juice is so clean that no particles are seen coming to the surface as the boiling goes on a little "clariphos," a preparation of phosphate of lime, is added at the rate of from one-half to one gallon—diluted with several times this much water—for each one thousand gallons of juice. This juice is then drawn off into settling tanks placed to one side of the building and just a little lower than the defecators. This clariphos precipitates any excess of lime that may have been added and carries down with it a quantity of other impurities. After settling for at least two hours this juice is then drawn into the evaporator placed on a still lower level, where the cleaning process is continued and it is finally brought to the consistency of syrup as determined by the Beaume hydrometer.
or saccharimeter which should indicate a gravity of between 33 and 34 degrees.

The steam is then quickly shut off and the syrup turned into a cypress tank still lower down from which it is drawn into cans, bottles, jugs, or barrels as the case may be.

All the apparatus above described is by no means absolutely necessary to make good syrup. One of the largest syrup makers in this state and perhaps the most successful uses a single evaporator without either defecators or settling tanks. He made this evaporator himself out of cypress wood and the necessary steam coil out of 2-inch galvanized iron pipe cut in lengths to fit the evaporator and connected with return bend elbows. He uses an ordinary siphon jet for pumping the juice, wooden troughs wherever possible for conducting syrup and juice, and wooden tanks entirely for holding juice, skimmings and syrup. In fact, aside from the boiler and engine which he utilizes at times to saw lumber and a cane mill which was bought second hand, this party made everything else about the factory himself. It is an easy matter to make defecators, evaporators, and juice tanks out of wood and we believe them superior to galvanized iron in that they color the syrup less. A convenient evaporator may be made of 2x10 cypress lumber bored with a 11-16 inch ship auger and bolted together every three feet with 5-8 inch iron rods. The factory just mentioned which belongs to the Allen Bros., of Emerald, Miss., has an evaporator made of this material and in this manner. It is ten feet long, five feet wide, and three and one-half feet high, with flanged top on three sides and a trough to catch skimmings on the lower end.

Containers for syrup,—The tin can is the best package for syrup that is to be placed regularly on the market for it is cheap, easily handled, and a reliable shipper. There are all kinds and sizes of these cans with soldered tops, screw tops, friction tops, and those that fasten and seal by patent devices. We have found the “Record Patent” self-sealing syrup can perhaps the most satisfactory of all. These cans are easy to fill and seal and the tops never push out in shipping as the ordinary friction top cans have been found to do.

The screw top cans are practically as good but the openings are much smaller and it requires more time to fill them. The cans with soldered tops are some cheaper but unless one is fitted up for filling and soldering these cans, they will give a lot of trouble. The friction top cans are also cheaper than the patent and screw top but do not ship well, though for home markets they are alright in every respect.
Bottles are good for fancy trade but are more costly than cans both to buy and to handle. They have to be strongly stoppered else the corks will be pushed out in warm weather even tho no sign of fermentation may be seen in the syrup. Jugs ship poorly and can only be used for the home market. Experience here has been that the barrel, half-barrel or keg will make excellent containers if the syrup can be marketed in fall or winter, otherwise they are not satisfactory, for the syrup in them will ferment with the approach of warm weather. If wooden receptacles are used they should be kept in cold storage until placed with the retailer. The neatness of the package has much to do with the sale of its contents, therefore all syrup cans or bottles should be attractively labeled and securely packed for shipping.

**Markets.**—There is almost an unlimited market for first class cane syrup that has an established reputation. However, there has been such a lack of uniformity in the syrup placed on the market in this state that at present it is rather a difficult product to dispose of. The station has been able to dispose of the syrup made here directly to consumers in this and other states and to merchants in nearby towns. It would be an easy matter to sell thousands of gallons every month of a good grade of cane syrup put up in quarts, half-gallons, and gallon cans through brokerage and wholesale grocery houses in Hattiesburg, Jackson, Meridian and Birmingham, but the seller of this syrup would have to prove the reliability of his product and be able to keep it up to a certain standard. Syrup sold in this way should net the producer from 30 to 35 cents a gallon which is not a bad price considering the yields that may be made per acre.

Experience here has been that syrup made as above outlined, cooked to 33 or 34 degrees and canned and sealed hot will not go to sugar and will keep fresh indefinitely. A certain prejudice exists, however, against the use of any chemical whatever in syrup making and we have made a great deal without using any means of purification whatever other than heat and mechanical processes. The untreated syrup has also kept perfectly and the quality has been good, but it has shown to be darker in color and so far as we were able to judge here the flavor has not been so good. The pure food laws are such that they may decide against the use of sulphur for bleaching and perhaps against lime and clariphos for cleaning, in which event the syrup maker will not be hurt and since all table syrups will be sold on their merit and the consumer will have to be satisfied with a little darker product and perhaps one not quite so palatable.