

12-1-1920

## The mosaic disease of sugar cane in Mississippi in 1920

L. E. Miles

Follow this and additional works at: <https://scholarsjunction.msstate.edu/mafes-bulletins>

---

### Recommended Citation

Miles, L. E., "The mosaic disease of sugar cane in Mississippi in 1920" (1920). *Bulletins*. 837.  
<https://scholarsjunction.msstate.edu/mafes-bulletins/837>

This Article is brought to you for free and open access by the Mississippi Agricultural and Forestry Experiment Station (MAFES) at Scholars Junction. It has been accepted for inclusion in Bulletins by an authorized administrator of Scholars Junction. For more information, please contact [scholcomm@msstate.libanswers.com](mailto:scholcomm@msstate.libanswers.com).

BULLETIN No. 191

DECEMBER, 1920

# The Mosaic Disease of Sugar Cane in Mississippi in 1920

By L. E. MILES

Plant Pathologist State Plant Board



Mississippi Agricultural Experiment Station  
Agricultural College, Mississippi

J. R. RICKS

DIRECTOR



# THE MOSAIC DISEASE OF SUGAR CANE IN MISSISSIPPI IN 1920

BY L. E. MILES, PLANT PATHOLOGIST.

STATE PLANT BOARD OF MISSISSIPPI

During the last few years a malady known as the mosaic disease, has occasioned severe losses in the sugar cane industry in Porto Rico. It was first noticed there about the middle of 1916. It is not a new disease, however, as it was recognized as an undesirable condition in sugar cane as early as 1890 by the Dutch in Java. It is also present in Cuba and Argentine, but was not recognized in this country until July, 1919, though it has evidently been here for a considerable number of years. At that time it was found by a Government agent that the river district in Louisiana was already severely infested, and at the present time it has already become one of the most serious problems with which the cane growers in that state have to deal.

After its discovery in Louisiana the various state authorities were immediately notified of its importance, and a survey of the Gulf States was made by Government scouts to determine the location of all infected areas, and, if possible, to trace the original importation and the course of its subsequent spread. The disease was located in Louisiana, Florida, Georgia, Alabama, and Mississippi, but was much more abundant in Louisiana than in any of the other states, as was naturally to be expected, considering the far greater size and proximity of the sugar cane fields. In some sections of that state near the Mississippi river, where it has been present for a number of years, nearly one hundred per cent of the cane is affected.

In the other states in which the disease is known to occur, sugar cane growing is mostly on a small scale, consisting usually of patches of only a few acres, or even of fractions of an acre, and is grown for syrup making only. In Georgia the only infections were located in one county, Grady County, but in Florida they were rather widely distributed over the state, due to the distribution of cuttings from experimental plots grown for the purpose of testing varieties. In Alabama and Mississippi infections were located at one point only in each state, the one in Mississippi being at Biloxi. The Government agent reporting it states that at that time it had spread from the farm on which it first appeared to one other farm in the vicinity.

The disease was originally introduced into this country, in all probability, through the Sugar Experiment Station of the Louisiana State University, at Audibon Park, which made a custom of importing new varieties with a view to obtaining some higher in sugar content and yield than those already grown here. In introducing these varieties, the disease was, of course, rather widely distributed before its nature was known. No particular blame should fall upon this institution or upon any private individual who was connected with its introduction as the disease is quite obscure and apt to be overlooked, there being only one variety, so far as known, in which it can be positively identified on the cuttings or on the seed cane after the leaves have been removed.

## SYMPTOMS OF THE MOSAIC DISEASE.

The first symptom observed in plants affected by the mosaic disease is a general pallor of the leaves, which may be discernible for several rods. Closer

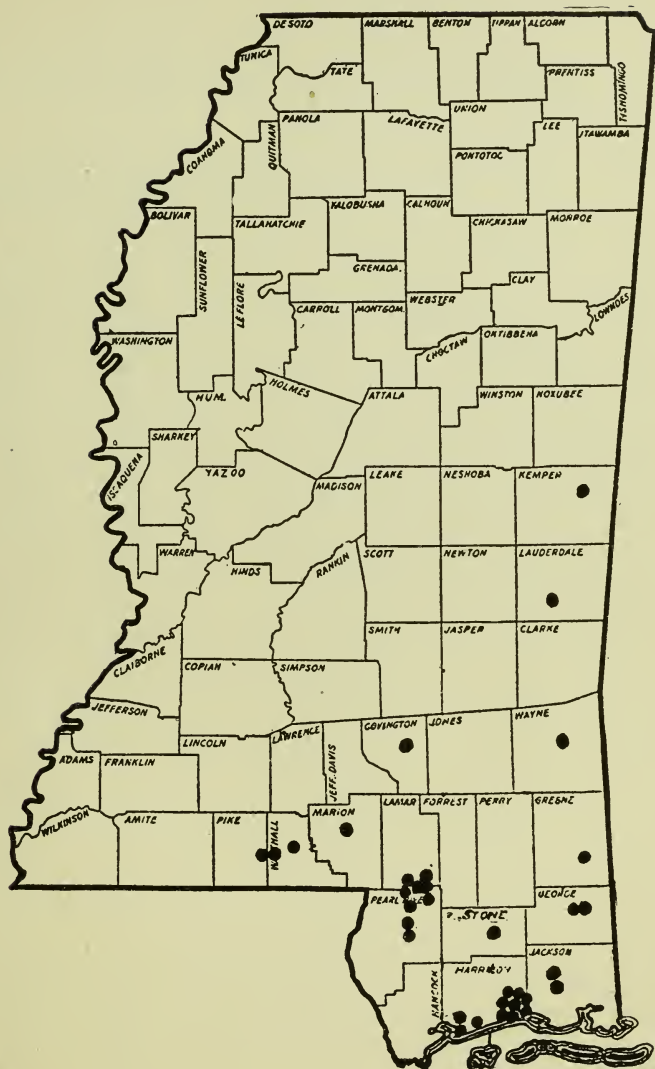
examination reveals that the pallor is due to irregular, light-colored streaks or spots on the leaves. In color the affected leaf areas are of two types. In the most common type the pale portion presents a "washed out" appearance, and is merely a dilution or a tint of the normal color. In the second type the pale spot presents a decided yellowish green appearance, though the normal and affected parts are always sharply delineated in either case. There is no gradual blending of colors in either type. Great diversity of patterns occurs in the different varieties due to the variation in the amount, size, and shape of the light colored areas, but in any particular kind of sugar cane, the arrangement is always quite constant.

In the youngest leaves of the ordinary varieties of cane grown in Mississippi the light areas are in the shape of alternate streaks, varying greatly in size but never continuous throughout the length of the blade. In general they are isolated from one another and are distributed uniformly over the leaf surface. When a leaf of the sugar cane is affected by the mosaic disease it is affected throughout its entire length from base to tip. The amount of normal colored tissue greatly exceeds the light tissue in the younger leaves, but as the leaf matures the light-colored areas, by becoming confluent predominate and it takes on a pallid or even yellowish appearance. The dark green, or normal, areas become quite scant and appear as elongated streaks in the pale green, a condition exactly the reverse of that in the young leaves, except that the dark green areas are less regular in outline.

In tropical countries where the cane is allowed to ratoon over a number of years secondary symptoms arise which are not met with in this country. The most severe of these is a cankering of the canes which is more marked in some varieties than others. The disease is never fatal during the first year, but its effects appear to be cumulative. In any case, it is more severe on cane arising from diseased seed, than on cane which has been infected secondarily in the field.

### INJURIES RESEMBLING MOSAIC.

There are many types of injury commonly found on cane leaves which might be confused with the mosaic disease by one not familiar with it. Chlorosis, due for the most part to soil conditions, often closely simulates this trouble. Here, however, the affected areas are opaque white or yellow and are usually in the form of regular stripes which extend the entire length of the leaf blade, a condition which never occurs in the mosaic disease. The opaque stripes may be about one-eighth inch wide and numerous with regular stripes of the normal green tissue between them, or they may be quite wide. Often the entire leaf is quite white. Rarely the chlorosis takes the form of a very fine white mottling of the leaf, but always in local patches, and never does it involve the entire leaf, as is invariably the case with the mosaic disease. Many fungi cause spotting of the leaf blades but these can always be distinguished by the fact that the spots usually turn brown and the leaf tissue dies. This dying of the tissue never occurs in the mosaic disease. Many sucking insects cause a very fine mottling of the leaf when the punctures occur in very great numbers, but this type of injury can usually be determined by close inspection, since the minute pale halos about the punctures are invariably circular in form and never show a tendency to elongate in the direction of the long axis of the leaf as is the case with the mosaic. Ordinarily, the punctures are scattered and can lead to no confusion.



MAP OF MISSISSIPPI SHOWING LOCATION OF PROPERTIES INFECTED WITH MOSAIC DISEASE OF SUGAR CANE IN 1920.

TABLE I.

Table showing number of properties inspected for sugar cane mosaic disease by counties and number of properties found infected during period from July 1 to December 31, 1920.

COUNTY.	Properties inspected.	Properties infected.	Total Acreage inspected.
Amite.....	10	0	5
Attala.....	9	0	3 5/8
Choctaw.....	12	0	10 5/8
Calhoun.....	2	0	1 1/2
Copiah.....	5	0	3
Covington.....	12	1	5 1/2
Forrest.....	5	0	6 7/8
Franklin.....	4	0	5 1/4
George.....	3	2	2 1/4
Greene.....	2	1	2
Harrison.....	31	11	48 1/2
Jackson.....	20	2	23
Jeff Davis.....	10	0	4 1/2
Jones.....	7	0	3 5/8
Kemper.....	1	1	1 1/4
Lamar.....	12	4	8 1/2
Lawrence.....	4	0	5 1/4
Lauderdale.....	2	1	3 3/4
Leake.....	10	0	5 1/4
Lincoln.....	12	0	9 7/8
Madison.....	1	0	1 1/2
Marion.....	2	1	1 1/2
Montgomery.....	4	0	3 1/4
Newton.....	1	0	1 1/2
Pearl River.....	15	5	3 2/5
Pike.....	13	1	12 3/4
Quitman.....	1	0	1 1/4
Rankin.....	6	0	4 1/4
Scott.....	9	0	5
Simpson.....	5	0	2
Sharkey.....	1	0	1 1/2
Smith.....	10	0	2
Sunflower.....	1	0	3/4
Stone.....	14	1	30
Walthall.....	13	2	23 3/4
Wayne.....	1	1	1
Webster.....	1	0	3/4
Wilkinson.....	3	0	1 1/4
Yalobusha.....	1	0	1
Yazoo.....	2	0	2 1/2
Total number counties scouted, 40.	276	34	294 1/4

TABLE II.

Showing Sugar Cane Mosaic Infections located in Mississippi during period from July 1, to December 31, 1920.

No.	PROPERTY.	TOWN.	Acres.	Per cent infected.
1	James Brodie.....	Biloxi.....	3	10
2	O. A. Law.....	Biloxi.....	3	50
3	C. E. Law.....	Biloxi.....	1	5
4	Dr. Bolton.....	Biloxi.....	1 1/2	1
5	J. A. Flurry.....	Vanceleave.....	6	10
6	J. E. Lockard.....	Vanceleave.....	1/20	10
7	D. J. Gay.....	Biloxi.....	2 1/2	20
8	J. A. Sutter.....	Pass Christian.....	1 1/2	1
9	Henry Kron.....	Biloxi.....	1/4	Trace
10	P. J. Ohr.....	Biloxi.....	1/2	50
11	C. M. Chafec.....	Biloxi.....	1	5
12	Thomas Webb.....	Long Beach.....	1/8	90
13	L. K. Hill.....	Pass Christian.....	4	75
14	I. E. Bass.....	Lumberton.....	1/2	1
15	I. H. Bass.....	Lumberton.....	1 1/2	100
16	Webster Ladner.....	Lumberton.....	3	75
17	J. E. Bell.....	Lumberton.....	3/4	1
18	Eli Byrd.....	Lumberton.....	2 1/2	1
19	Wilmer Bryd.....	Lumberton.....	1	30
20	J. E. Byrd.....	Lumberton.....	1 1/2	1
21	O. W. Dunaway.....	Tylertown.....	1 1/2	1
22	N. R. O'Quinn.....	Tylertown.....	2	10
23	Joe Williams.....	Poplarville.....	3	1
24	Sol Moody.....	Poplarville.....	1/2	20
25	J. W. Watts.....	Columbia.....	1	20
26	W. M. Conerly.....	Tylertown.....	1/4	20
27	J. A. Allman.....	Lucedale.....	3/4	Trace
28	Mrs. J. H. Howell.....	Lucedale.....	1/2	Trace
29	Rufus McGill.....	Collins.....	1/2	Trace
30	James Byrd.....	Leakesville.....	3/4	Trace
31	L. K. Saul.....	Waynesboro.....	1	Trace
32	Nathan Roberts.....	Meridian.....	3/4	Trace
33	W. H. Beck.....	Scooba.....	1/4	5
34	J. B. Dorsett.....	Wiggins.....	10	Trace



## HISTORY IN MISSISSIPPI.

Although the disease was found at only one point in Mississippi in 1919, at Biloxi, in Harrison County, reference to the map showing the location of the properties found infected this year will show that the disease is considerably more widely distributed in the state than one might be led to expect. There is no question but that most of these infections were present at that time, but were not found, as the survey made by the Government agent was necessarily quite general and hurried on account of the large area necessary to be covered.

Moreover, there is little doubt but that more thorough and extensive scouting, such as will be done by the State Plant Board next year, will reveal many more properties on which the disease occurs.

Reference to Table I will show that 276 properties in the state, located in 40 different counties, and comprising a total acreage of 294 $\frac{1}{4}$  acres, were visited and inspected either by the writer or by inspectors of the State Plant Board during the latter half of the present year. Of this number, 34 properties, located in 14 different counties, were found to be infected with the mosaic disease. The list of properties, and the per cent of the infection on each, is presented in Table II.

Below is given a brief account of the discovery of the disease in each of the infected counties.

**Harrison County**—On July 9, 1920, the writer, accompanied by Mr. R. P. Barnhart, Citrus Canker Inspector for the State Plant Board, rediscovered the disease on the property near Biloxi on which it had been found the previous year by a Government agent. The owner of this property had destroyed most of the stubble of the diseased cane but had planted a row of it immediately alongside a small patch of supposedly disease-free cane as an experiment to determine the rate at which the disease would spread. Practically all the canes from the diseased seed of the previous year, which was of the variety known as D74, and had been obtained from the Sugar Experiment Station of the Louisiana State University, at Audibon Park, were diseased, and approximately ten per cent of that adjacent to it was infected. However, the value of the experiment was rendered practically null, when it was discovered that the property from which the supposedly disease-free cane had been obtained was also infected with the mosaic. Another small patch of cane on the same property on which the experiment was being conducted, but completely isolated from the diseased D74 cane, was also found to be slightly infected. The seed for this patch was obtained from the same source as the supposedly disease-free stock mentioned above.

A number of different individuals in the county had obtained seed from this same source, and, though the per cent of infection on the property in question was only about one per cent this year, the percentage of infection on the cane grown from the seed obtained from it the previous year and distributed among a number of individuals ranged all the way from zero to practically one hundred per cent.

**Jackson County**—On July 23, 1920, the writer, accompanied by W. M. Mingee, employed by the U. S. Bureau of Entomology on Sweet Potato Weevil

Investigations, discovered the disease on a property near Vancleave. An infection of approximately ten per cent was found in a field of about six acres. The cane was a so-called white variety and the seed had been obtained from a neighbor who had brought it originally from Louisiana. On the next day the neighbor's property was investigated. It was found that he had lost most of his seed the previous winter and he had only a few stalks left, but they presented an infection of approximately fifty per cent of the mosaic disease.

**Lamar County**—The first infection in this county was found by the writer on August 25, 1920, on a property near Lumberton. It presented an infection of only about one per cent. However, on the property of the son of the individual referred to above, the cane was approximately one hundred per cent infected. The seed for this cane had been obtained from the father who stoutly maintained that it had been grown on his property for a considerable number of years. However, he later recalled that some ten years ago a few stalks of a rare variety had been obtained from the Experiment Station at Audibon Park, but that this variety had been discarded later since it did not prove desirable. It was undoubtedly from this source that the disease had been admitted to these properties.

On August 27, 1920, Mr. R. C. Price, an Inspector for the State Plant Board, located another slight infection on a nearby property, but it apparently had arisen from an entirely different source which could not be located exactly.

**Pearl River County**—On August 27, 1920, the writer located the first case of mosaic discovered in this county, only a short distance away from those recorded in Lamar County. Most of the infections located in this county and two of those found in Lamar apparently came from the same source, some cane of a white variety, whose origin could not be determined.

**Walthall County**—On August 30, 1920, the writer located the first infection found in Walthall County a few miles west of Tylertown on the Pike County line. This was a ten per cent infection, the source of which could not be determined, as the cane had been grown on the same property for a number of years. On September 13, 1920, the writer located another infection a few miles north of Tylertown. It was not severe, only about one per cent, and the owner claimed that the cane was home grown. However, there was a little white cane present, mixed with the other, for which he was unable to account.

**Pike County**—On August 30, the writer located the first and only infection found in Pike County so far. It was just over the line from Walthall County and the first infected property recorded in that county was less than a quarter of a mile away. The percentage of infection was about ten per cent in one field and about one per cent in another on the same property. Both were from home grown seed as far as could be determined.

**Marion County**—On September 10, Mr. R. C. Price, an inspector for the State Plant Board, reported finding a twenty per cent infection on a property a few miles from Columbia. As far as could be determined the cane had been grown on the same place for a number of years.

**George County**—On September 13, Mr. H. L. Dozier, Assistant Entomologist for the State Plant Board, reported finding a trace of the mosaic disease on two different properties near Lucedale. The cane was reported home grown in both cases. There is a probability that a more serious infection exists somewhere nearby, which has not yet been located.

**Covington County**—On September 14, Mr. E. K. Bynum, Inspector for the State Plant Board, reported finding the mosaic disease on a property near Collins. The cane was reported to have been grown on the farm for a number of years.

**Greene County**—On September 15, a trace of the mosaic disease was reported on a property near Leakesville by Mr. R. P. Colmer, an inspector for the State Plant Board.

**Wayne County**—On September 16, Mr. George L. Lott, an inspector for the State Plant Board, reported finding a trace of the disease on a property near Waynesboro. The cane had been grown on the farm for two or three years but could not be traced back farther than that.

**Lauderdale County**—On September 25, Mr. George E. Riley, an inspector for the State Plant Board, reported finding sugar cane mosaic disease on a property near Meridian. The degree of infection was not reported. The cane was reported home grown for six years.

**Kemper County**—On September 28, Mr. George E. Riley reported another infection of sugar cane mosaic near Scooba. This was also home grown cane, so far as could be ascertained, and was reported as a medium infection.

**Stone County**—On September 28, Mr. D. C. Neal, Plant Pathologist for the Mississippi Agricultural Experiment Station, reported finding a trace of the mosaic disease in a ten acre field near Wiggins.

### LOSSES DUE TO THE MOSAIC DISEASE.

No extensive data has been accumulated as yet, owing to the short period of time that has elapsed since the disease was first recognized in this country, to determine whether the loss caused by the sugar cane mosaic is as great here as in Porto Rico. However, a few figures reported from Louisiana indicate that it may cause a decrease in yield almost as large as that experienced on that island if it is allowed to become widespread here. There the loss varies from five to forty per cent, depending upon the variety of cane, with most of the instances varying toward the higher figure. The owner of one property in Mississippi, which was found very severely infected with the disease, reported that he had realized for some time that something was wrong with his cane as it did not appear to thrive as it should and the yield was low. He had made efforts to find out what the trouble was, and failing in that, had about decided to destroy his stubble and start over with new seed. This instance sheds some light on what the disease can do when it once becomes established in a field.

Experiments have shown that cane free of the disease grows off much faster than diseased cane and undoubtedly will make a better yield. Cane affected by the disease often makes a good growth in favorable situations, but never makes the growth that healthy cane would make under the same conditions.

## QUARANTINE AND CONTROL MEASURES.

The State Plant Board of Mississippi, recognizing the serious nature of the disease, and realizing that now, before it gains too firm a foothold, is the time to take steps toward its eradication in the State, has passed quarantine regulations prohibiting the importation of sugar cane, for any purpose whatsoever, into the State from any other state without a special permit, to be granted by the State Plant Board, when it is assured by the proper authorities that the cane in question is free from the disease and is from a region in which the disease is not known to occur. It also has passed regulations forbidding the shipment of sugar cane from the infected counties in this state to any other counties where the disease is at present unknown.

Where the infections of the mosaic disease is only 20 per cent or below, a method of control known as "roguing" is advised. This consists in going through the field and pulling up by the roots all infected stalks. These stalks may then be thrown down between the rows, since, as soon as they have begun to wilt, there is no further danger of infection from them. The incubation period of the disease is about seventeen days, that is, it is seventeen days after the cane has been infected, before it becomes apparent. For this reason, the roguing process should be repeated at intervals of not more than a month, in order to get rid of all stalks which may have been infected but were in the incubation period, at the former time. When repeated examination at the stated intervals reveals no more infected stalks, the owner may feel assured that he has gotten rid of the disease.

In cases where the percentage of infection is greater than 20 per cent, the loss due to the destruction of the diseased stalks would be too great to permit of this method. In such a case, the owner should grind his cane and make his syrup as usual but should save no seed from the infected field. He should also destroy all refuse and plow up and destroy the stubble. The ground should then be devoted during the next year to some crop other than grain, as, for instance, potatoes, peas, beans, etc. He should then take care in getting seed for the next year from a property that is free from the disease. If these precautions are followed, and the new seed is planted in ground not devoted to sugar cane the previous year, the new crop should be free from mosaic.

## EXAMINATION OF SPECIMENS.

The State Plant Board is always ready to examine specimens for any grower in the state if he is in doubt in regard to any trouble he may be having. Specimens of the mosaic disease of the sugar cane are usually quite unsatisfactory when sent in, due to the fact that the plants soon discolor, which makes identification of the disease difficult. However, if the top of a diseased stalk is cut off, the cut end wrapped in a moist cloth, and mailed immediately in a box or similar container, it may reach us before this discoloration occurs. We are glad to get specimens as it assists us in our survey of the state. In any case, if you are in doubt as to whether or not your sugar cane has the mosaic disease, notify the State Plant Board, and if possible, we will see that one of our inspectors visits you. Address all communications concerning the mosaic disease to the Plant Pathologist, State Plant Board, Agricultural College, Mississippi.

### AVAILABLE PUBLICATIONS.

Available publications on the mosaic disease of sugar cane are:

- (1) Brandes, E. W., 1919—The Mosaic Disease of Sugar Cane and Other Grasses—U. S. Dept. Agr. Bul. 829.
- (2) Brandes, E. W., 1920—Artificial and Insect Transmission of Sugar Cane Mosaic—Jour. Agr. Research, Vol. 19, pages 131-138.
- (3) Edgerton, C. W., 1920—A Method of Selecting L511 Cane Free of the Mosaic Disease for Planting Purposes—Louisiana Bul. No. 176.