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Recommended Citation

Edgerton, C. W. (1920). A method of selecting L 511 cane free of the mosaic disease for planting purposes. (176) Retrieved from <https://repository.lsu.edu/agexp/223>

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Agricultural Experiment Station

of the

Louisiana State University and
A. & M. College

Baton Rouge

A Method of Selecting L 511 Cane Free of the Mosaic Disease for Planting Purposes

BY

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A METHOD OF SELECTING L511 CANE FREE OF THE MOSAIC DISEASE FOR PLANT- ING PURPOSES

C. W. EDGERTON.

One of the most serious problems before the Louisiana sugar planter at present is the mosaic disease of the cane. This trouble has been in the state for several years and during the past two years has been spreading very rapidly. It occurs on a large percent of the plantations along the Mississippi river and is scattered in other parts of the state. In some sections along the river, where the disease has been present for several years, nearly one hundred percent of the cane is affected, and in the rest of this district the infection averages from five to thirty percent.

This disease is undoubtedly doing considerable damage in this state. Experiments which have been carried on during the present season show that cane free of the disease grows off much faster than diseased cane and will unquestionably make heavier yields. Cane affected with the disease often makes a very good growth in a favorable situation, but it does not make the growth that healthy cane would under the same conditions.

The disease has become so widespread in Louisiana, not only upon cane but also upon sorghum, corn and a number of wild grasses, that there is but little hope of ever eradicating it completely. Consequently, in order to cut down their losses, the planters should take all known precautionary methods to check the spread of the disease and keep it under control. The control measures are not very well worked out as yet, but there are a few things that can be done which will be of material help. In this bulletin is described a method of selection of seed of one variety—the L 511—which, if followed consistently from year to year, will probably almost eliminate the loss with this variety.

Of all the commercial varieties of cane grown in this state, the L 511 is the most resistant to the mosaic disease. Even in those regions where ordinary varieties, such as D 95, D 74, Purple and Striped, show nearly one hundred percent infection with the mosaic disease, the L 511 rarely shows more than fifty

or sixty percent and often considerably less. Also the disease spreads slowly in a field of L 511 cane as compared to the rapid spread which often takes place on the other varieties. This variety is also a most desirable cane in many other respects, and it is probable that it will become one of our leading varieties. In the few places where it is grown on a large enough scale to be important, it is recognized as a most desirable cane. The variety, consequently, becomes more valuable when it is realized that it shows some natural resistance to the mosaic disease.

One of the most promising methods of controlling the mosaic disease is by using disease-free seed for planting purposes. Disease-free seed will produce healthy stalks and infected seed

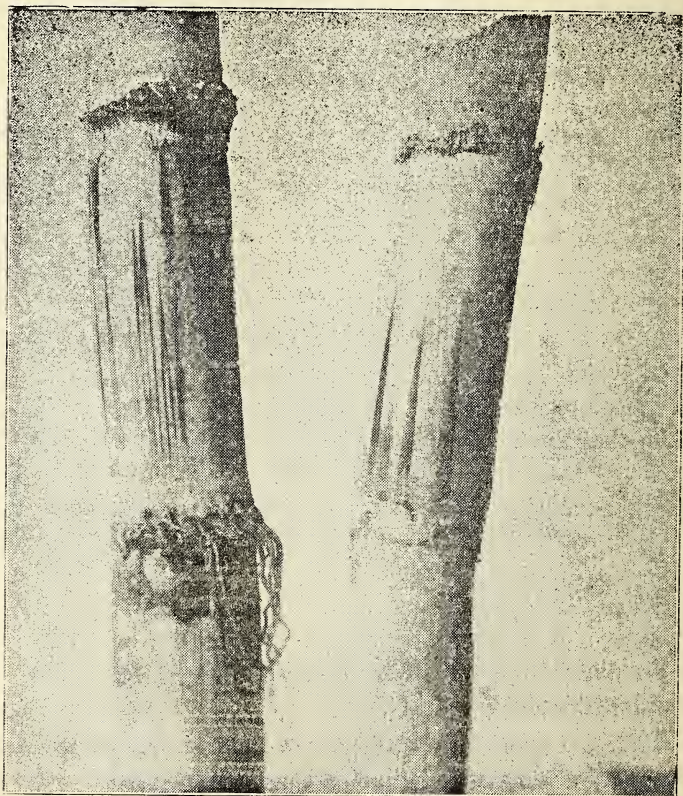


Figure 1. Stalks of L 511 cane affected with the mosaic disease. Red stripes on the stalks of this variety always show the presence of the disease.

will produce diseased stalks. If it were possible to plant disease-free seed and then prevent the secondary infection the following summer, the disease could be eliminated. Consequently, any method of selection that will insure disease-free seed constitutes a forward step in the control of the disease. In the tropics, and to a small extent in Louisiana, planters have shipped in seed from regions where the disease was not present. In Louisiana, such an operation is very expensive on account of the large amount of cane that is necessary for planting an acre. What is most desired is some method of selecting this disease-free seed on the plantation on which it is to be planted.

With the ordinary varieties of cane, such as D 74, D 95, Purple and Striped, the selection of seed cane free from mosaic in a field that contains the disease is slow and tedious, as well as expensive, work. To make sure that the stalks are not affected it is necessary to examine the leaves before the stalks are cut and stripped. This requires a man thoroughly acquainted with the disease to accompany the cutters.

With the L 511 variety, it is not necessary to examine the leaves, as the presence of the disease can be readily told by the appearance of the stalks. This makes the selection of disease-free seed a comparatively simple operation. The cane can be cut in the usual way, after which a man acquainted with the appearance of the disease can rapidly select out the healthy ones.

Healthy stalks of L 511 cane are greenish in color. They never show lines or stripes up and down the joints. Red stripes, however, are always present on diseased stalks, especially on the lower joints. These red stripes always run lengthwise of the stalk and they vary in width from mere lines up to an eighth of an inch. These stripes may be numerous on the stalk or they may be scattering, but the presence of a single one shows that the stalk is affected with the mosaic disease. Stalks of L 511 cane affected with the mosaic disease and showing these red stripes are illustrated in figure 1. In selecting L 511 cane for seed, all stalks that show these stripes should be thrown out and sent to the mill. With a little experience,

a man can select the disease-free seed almost as rapidly as he can handle the stalks.

During the planting season of 1919, some experiments were started at the Audubon Park Sugar Station in New Orleans to test out the value of this method of selecting L 511 cane and also the value of planting healthy cane of other varieties in close proximity to diseased blocks of cane. Four rows an acre long were planted with selected, disease-free L 511 seed and the adjoining four rows were planted with seed that showed the presence of the mosaic disease by the red stripes on the stalks. It took less than an hour's time to select out enough disease-free seed to plant the four rows. The L 511 cane was growing on the station grounds where the mosaic disease had been present several years. At the same time, small plots were planted with disease-free seed of the varieties D 74 and D 95. This seed had been shipped in from a section of the state in which the disease does not as yet occur. These experiments were intended to give information not only on the possibility of selecting healthy seed in this manner, but also on the rapidity of the spread of the mosaic disease on the different varieties.

During the summer of 1920, the cane growing on the different plots was examined at frequent intervals. The first examination was made on May 25. On that date, there were but five diseased stalks in the four rows planted with selected, disease-free L 511 seed, while practically all of the stalks growing from the cane that showed red stripes had the disease. This low percent of disease showed that this method of selection was entirely satisfactory. Probably as many stalks would have slipped in if the seed had been examined in the field before cutting.

As the season advanced, there was some spread of the disease in the plot of selected L 511 cane. This was to be expected, as the plot was entirely surrounded by badly infected blocks of cane of various varieties, yet on September 2, a count showed that in one row there were only forty-eight diseased stalks, as against one hundred and thirty healthy ones. At the same time in the adjoining row, planted with diseased seed, there

were one hundred and thirty-five diseased stalks and no healthy ones. It should also be noted that the cane in the plot from healthy seed grew much better and faster during the summer than the cane in the other plot.

Had these four rows of cane from selected seed been growing in an isolated place and the five diseased stalks removed in the spring, there is little doubt but what the cane would have remained practically free of the disease throughout the season.

In the plots of D 74 and D 95 cane planted with healthy seed, the young plants were healthy when they came through the ground in the spring, but the disease spread much faster in them than it did in the L 511 plot. By the middle of August, these plots showed one hundred percent infection with the mosaic disease. This experiment demonstrated that cane of the L 511 variety growing from disease-free seed selected from an infected field is more resistant to the mosaic disease than cane of these other varieties growing from seed from a non-infested locality.

Considering these experiments, it is believed that every planter who intends to grow L 511 cane will find it to his advantage to select disease-free seed for planting each fall. If he is only growing a small amount, it would be advisable for him to select the seed for the entire planting. If he is growing the cane on a large scale, it would be best for him to lay out a seed plot each fall. In this plot could be planted selected, disease-free seed and the following fall all the cane grown on the plot could be used for planting the main crop. If this system were followed consistently every year, it seems very probable that the loss due to this disease with this variety would be kept at a minimum.

Those planters who only have a small amount of L 511 cane and are increasing it as rapidly as possible from year to year, will find it to their advantage to select out all the healthy stalks and plant them in a separate plot. This will in a few years give them a better cane and much less of the disease.

