

MISSISSIPPI AGRICULTURAL EXPERIMENT STATION

A. & M. College, Mississippi

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Corn Seed Treatment Experiments

—By—

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During the past five or six years, the use of certain organic mercury disinfectants has been so generally recommended by their manufacturers and dealers for the control of seed-borne diseases of corn that many inquiries concerning their value have been received from the farmers of this State. The purpose of this circular is to give the desired information about this question

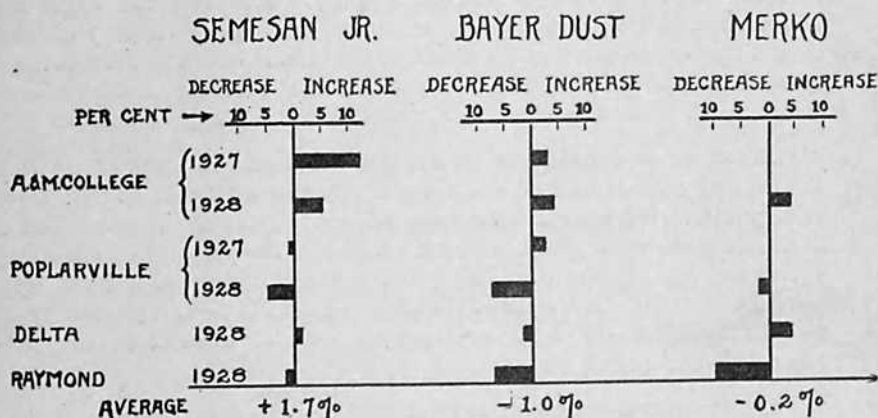


Fig. 1. Graph showing percentage increases and decreases in yield from lots of seed corn treated with various disinfectants over untreated.

based upon comparative experiments conducted in various parts of the State during 1927 and 1928 by the Mississippi Agricultural Experiment Stations in cooperation with the Mississippi State Plant Board.

The first corn seed treatment experiments in Mississippi were conducted in 1927 at A. & M. College and Poplarville. In 1928, the experiments were conducted at A. & M. College, Poplarville, Stoneville and Raymond. In each of these tests, samples of ordinary seed corn, such as is used on the average Mississippi farm, of the Mosby and Coker's Prolific varieties were used. The

samples of seed were treated with either Semesan Jr., Bayer Dust, Corona Merko—three of the organic mercury disinfectants—or Stimulene, a patented product which was supposed to increase yields miraculously by stimulation. Three ounces of Semesan Jr., two ounces of Bayer Dust, and two ounces of Merko were used per bushel of corn. The seed corn was treated with these disinfectants by placing the desired quantity of seed and disinfectant in a small, tight drum which had been provided with stationary agitators and shaking vigorously for three minutes. A very uniform coating was obtained by treating the seed in this manner. The Stimulene treatment was made by soaking the samples of seed corn for 12 hours in a solution made by dissolving four ounces of the compound in one gallon of water.

After the corn had soaked the desired length of time, it was spread out to dry. Untreated samples of seed corn were used for the checks. The corn was planted in one-row plats which varied in the different experiments from 100 to 175 feet in length. Six replications were planted in each of the tests except in the 1928 Poplarville test which had ten replications for each treatment. All the plats in a given experiment received the same fertilization, cultural care, etc.

Effect of seed treatments on germination. In the experiments conducted at A. & M. College in 1927 and 1928, three kernels of corn were planted in each hill in order to determine the effect of the seed treatments on germination. When the corn had reached a height of four or five inches, the plants were counted and the per cent of germination obtained by dividing the number of plants by the number of kernels planted. The results from these observations are given in table 1. These results indicate that the organic mercury disinfectants increased the germination slightly. However, the slight increase in germination from treating seed corn with the organic mercury disinfectants is of little or no value under Mississippi cultural conditions where an excess of seed is usually sown and the plants thinned to the desired stand after germination. Stimulene had no apparent effect upon germination.

Effect of seed treatment on cob discoloration. In view of the fact that the cobs of corn from stalks which are infected with root and stalk rots are usually discolored, counts were made of each plat in the tests of 1928 on the number of ears with discolored cobs. Although the per cent of discolored cobs varied slightly in the different plats, the untreated ones did not show any more discoloration than some of the treated plats; in fact, there was practically no difference in the total average per cent of discolored cobs from the treated and untreated plats.

Effect of seed treatment on yields. Since the final analysis of the value of any treatment is its effect upon the yield, careful records were kept on the amount of corn produced in each plat of these experiments. The average yields in bushels per acre are tabulated in table 2 and the per cent of increases and decreases of the treated plats over the untreated are illustrated in figure 1. A study of the results as shown in table 2 and figure 1 shows that the various treatments had no significant influence on the yield of corn.

The yield records from these experiments are in accord with those obtained from similar experiments conducted in Illinois, Indiana, Iowa and Nebraska. In all of these experiments the treating of seed corn with any of these disinfectants has not increased the yield materially except in cases where the

seed was diseased by *Diplodia zeae*. The treatment of seed infected with this disease has usually increased the germination and yield over the untreated seed corn. In most cases, however, untreated, apparently disease-free seed has produced better yields than treated *Diplodia*-diseased seed. Since *Diplodia*-diseased corn, which is characterized by the rotting of the grain and a more or less moldy growth, can be readily distinguished from sound corn, it is usually discarded in the selection of seed ears. The treatment of seed diseased by *Fusarium moniliforme* has not had any influence upon the yield. In a few cases, the treatment of corn infested with *Cephalosporium acremonium* or with *Giberella saubinetii* has apparently increased the yields, but the results have not been consistent enough to be significant.

CONCLUSION

The results of these experiments, as well as of those obtained from experiments conducted in other states along the same line, indicate that where precautions are taken to select sound ears of corn for seed, there is little or no benefit to be derived from treating such seed with the organic mercury disinfectants.

TABLE 1
EFFECT OF TREATING SEED CORN WITH VARIOUS DISINFECTANTS UPON
GERMINATION—A. & M. COLLEGE, MISSISSIPPI

Treatment—	Per Cent Germination		Average
	1927	1928	
Untreated	87.8	77.9	82.9
Semesan Jr.	89.1	83.8	86.5
Bayer Dust	88.9	85.3	87.1
Merko	—	82.1	—
Stimulene	87.7	—	—

TABLE 2
EFFECT OF TREATING SEED CORN WITH VARIOUS DISINFECTANTS UPON
THE YIELD IN BUSHELS PER ACRE

Treatment—	A. & M. College		Poplarville		Delta	Raymond
	1927	1928	1927	1928	1928	1928
Untreated	62.1	52.7	53.5	47.9	54.8	36.3
Semesan Jr.	69.4	56.2	53.0	45.7	55.2	35.4
Bayer Dust	63.3	54.5	54.6	45.2	54.3	33.9
Merko	—	55.3	—	47.2	56.7	33.2
Stimulene	65.4	—	53.2	—	—	—