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AGRICULTURAL EXPERIMENT STATION

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MISSISSIPPI

1964 MISSISSIPPI COTTONSEED SURVEY

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Cotton is the major agricultural crop produced in Mississippi. Each year farmers spend much money on fertilizers, herbicides, insecticides, and equipment. They place much less emphasis, however, on the quality of the seed they plant.

Planting high quality seed contributes greatly towards the realization of maximum profits. High quality seed emerge from the soil more rapidly and to a more uniform stand than seed of inferior quality. Stand failures and the need for replanting could be minimized in many areas of the Southeast by initially planting high quality cottonseed.

Replanting often poses problems other than added expense. Replanting fields where pre-emergence herbicides were initially used can result in seedling injury if certain precautions are not followed.

What is meant by quality cottonseed? One of the main components of seed quality is the germination percentage. Other factors, however, are also essential for top quality seed. Some of the more important are: (1) low percentage of gin cut or damaged seed. (2) adequate treatment with a fungicide; (3) freedom from noxious weed seeds; (4) minimum amount of gin trash and other inert material; (5) trueness-to-variety; and (6) high seed vigor.

In 1964 the Mississippi Seed Technology Laboratory conducted a survey to determine the quality of cottonseed planted in Mississippi. A total of 738 samples were collected during the spring planting season from 43 counties in Mississippi.

Information accompanying each sample stated the source of the seed and whether certified or non-certified. After this information was recorded, the samples were visually inspected to determine the type of seed processing (gin run, machine delinted and/or flame delinted, or acid delinted) and whether or not the seed were treated with a fungicide. One

pound of seed from each sample was used to determine the incidence of cocklebur. Seed for the standard germination test were also taken from the one pound sample.

All samples of gin run and machine delinted seed were then acid delinted so that the percentages of damaged seed and immature seed could be determined. The percentage of damaged seed was determined by visually examining 200 seed from each sample. The percentage of immature seed was determined by processing 50 grams of seed from each sample on a South Dakota seed blower.

Results

Of the samples collected in this survey, 36.2 percent represented certified seed. The vast majority (93 percent) of the samples were machine delinted and approximately 94 percent of the seed were treated with a fungicide. Cockleburs were present in 26 percent of the samples.

Overall, the germination percentage of cottonseed planted in Mississippi in

1964 was high. The average germination of the 738 samples collected in the survey was 85.8 percent. Approximately 88 percent of the samples germinated above 80 percent. Excellent environmental conditions during the 1963 harvesting season were probably the most important factors contributing to the high germination of the seed planted in 1964. Approximately 40 percent of the samples contained 5 to 10 percent damaged seed and 1 to 2 percent, by weight, of immature seed.

Non-Certified Seed

As indicated in Table 1, 471 of the samples collected were non-certified seed. Of these, 90.4 percent were machine delinted, 6.8 percent were of the gin run type, and 2.8 percent were acid delinted. A seed fungicide had been applied to 90.0 percent of the non-certified samples.

Approximately 70 percent of the non-certified seed samples were free of cocklebur. However, 6 percent (28 samples) contained more than 5 cockleburs per pound.

Table 1. Characterization of the certified and non-certified cottonseed samples collected.

	Certified		Non-Certified	
	Number of samples	Percentage of total	Number of samples	Percentage of total
Total number of samples	267	100.0	471	100.0
Seed type				
Machine delinted	260	97.4	426	90.4
Gin run	0	0.0	32	6.8
Acid delinted	7	2.6	13	2.8
Seed treatment				
Treated	265	99.2	428	90.9
Untreated	2	0.8	43	9.1
Cocklebur per lb.				
0	218	81.6	331	70.3
1	27	10.1	55	11.7
2	10	3.7	28	5.9
3	6	2.2	13	2.8
4	4	1.5	11	2.3
5	1	0.4	5	1.1
Over 5	1	0.4	28	5.9
Seed germination				
90—100%	82	30.7	145	30.8
80—90%	155	58.1	266	56.4
70—80%	23	8.6	37	7.9
Below 70%	7	2.6	23	4.9
Seed damage				
0—5%	56	21.0	177	37.6
5—10%	124	46.4	177	37.6
10—15%	53	19.9	86	18.3
Over 15%	34	12.7	31	6.5
Immature seed				
0—1%	50	18.7	88	18.7
1—2%	121	45.3	183	38.9
2—3%	57	21.3	98	20.8
Over 3%	39	14.6	102	21.6

ACKNOWLEDGEMENT

This survey would not have been possible without the full support and cooperation of the personnel of the Cooperative Extension Service and Mississippi Seed Improvement Association. Special appreciation should be extended to the county Extension personnel who collected the samples.

Most of the non-certified samples germinated above 80 percent with only 4.9 percent of the samples germinating below 70 percent. Approximately 75 percent of the non-certified samples contained less than 10 percent damaged seed. Over 21 percent of the samples contained more than 3 percent immature seed.

Certified Seed

The analyses of the certified seed samples are also presented in Table 1.

Machine delinted was the predominant method of processing of the certified samples (97.4 percent). None of the samples were of the gin run type, while 7 samples were acid delinted. In addition, over 99 percent of the seed were treated with a fungicide.

As indicated in Table 1, approximately 82 percent of the certified samples were free of cocklebur. Approximately 10 percent of the samples contained 1 cocklebur per pound and only 1 sample contained more than 5 cockleburs per pound.

Of the arbitrary categories listed in the table, the largest percentage of certified seed germinated between 80 - 90 percent, contained 5 - 10 percent damaged seed, and possessed between 1 - 2 percent immature seed.

Comparative Quality of Certified and Non-Certified Seed

A comparison of several seed quality factors between certified and non-certified seed samples is shown in Table 2.

Certified seed germinated about 1 percent higher than non-certified seed, but the lowest germinating sample of certified seed was 64 percent as compared to about 9 percent for the lowest non-certified sample.

Certified seed contained approximately 1.5 percent more damaged seed but 0.2 percent less immature seed.

An average of 1.8 cocklebur per pound was present in non-certified seed while only 0.4 cocklebur per pound was present in certified seed. Also, the highest number of cockleburs per pound of cottonseed present in non-certified seed was 141 compared to a top number of 8 per pound for certified seed.

Comparison of Quality Among the Types of Processed Seed

As originally indicated, the majority of the seed samples were machine delinted. Therefore, a valid comparison of quality factors among various seed types based on an equal number of samples was not possible. It is believed, however, that the data presented in Table 3 are representative for each seed type.

The gin run samples of cottonseed germinated approximately 5 percent less

Table 2. Comparative quality of certified and non-certified seed.

	All samples	Certified	Non-Certified
Germination (%)	85.8	86.5	85.4
Range		64.0—94.5	8.5—96.5
Seed damage (%)	8.1	9.1	7.5
Range		0.0—28.0	0.0—34.5
Immature seed (%)	2.1	2.0	2.2
Range		0.0—5.2	0.0—8.0
Cocklebur per lb.	1.3	0.4	1.8
Range		0—8	0—141

Table 3. Comparison of seed quality among the various types of processed cottonseed.

Seed Type	No. Samples	Germ. (%)	Seed damage (%)	Immature seed (%)	% Samples containing cockleburs
Machine delinted	686	86.0	8.4	2.1	26.2
Gin run	32	81.5	2.7	2.9	25.0
Acid delinted	20	86.9	6.5	0.5	0.0

Table 4. Cottonseed quality data among 11 certified seed producers in Mississippi.

Seed producer	Total no. of samples	Germ. (%)	Seed damage (%)	Seed immaturity (%)	No. samples containing cockleburs
A	25	87.9	8.4	1.6	0
B	20	80.8	10.0	1.7	0
C	16	83.5	18.2	1.6	1
D	13	86.5	12.8	2.0	5
E	13	85.9	12.7	2.4	2
F	13	83.6	6.4	3.5	3
G	9	88.6	13.2	2.1	0
H	6	89.0	9.0	1.9	1
I	6	91.2	10.0	1.1	3
J	5	90.7	8.5	2.3	0
K	5	88.5	8.5	3.2	0

than the machine delinted or acid delinted samples. Also, the percentage of immature seed was highest in gin run seed. The percentage of seed damage was considerably lower for gin run seed as compared to machine delinted or acid delinted seed. The percentage of samples containing cocklebur was approximately 25 for both machine delinted and gin run seed. No cocklebur were found in any of the acid delinted samples.

Comparison of Cottonseed Quality Among Producers

At least 5 or more samples of Mississippi certified cottonseed were received in this survey from each of 11 certified seed producers (Table 4). As indicated by the data in this table, the average percentage of damaged seed varied from a high of 18.2 (Producer C) to a low of 6.4 (Producer F). While the ultimate effect of seed damage on the overall field performance and storage potential of a lot of cottonseed is not known, it is believed that damaged seed are lower in vigor than undamaged seed.

The percentage of immature seed varied from 1.1 to 3.5 percent. It should be noted that the largest percentage of immature seed were contained in samples from Producer F, whose seed also contained the smallest percentage of damaged seed.

Summary and Conclusions

The quality of cottonseed planted in Mississippi in 1964 was above average, as indicated by an average seed germination percentage of approximately 86 percent. Favorable environmental conditions during the 1963 harvesting season were probably the most influencing factors contributing to the high germination of the seed planted in 1964. The germination range among samples was from 8.5 to 96.5 percent.

On the average, 8 percent of the seed were visibly damaged. However, some samples contained 20 to 30 percent damaged seed.

Seventy-four percent of all samples tested were free of cockleburs. Four percent of the seed samples contained more than 5 cockleburs per pound of cottonseed.

Machine delinted, treated cottonseed were by far the most prevalent type of seed planted. Only 4 percent of the seed were gin run and 3 percent were acid delinted.

Certified seed samples germinated slightly higher than the non-certified seed and contained less immature seed and cockleburs. However, higher percentages of damaged seed were present in certified seed.