Report of the Seed Analysis Committee

DUE to a late start this year the work of the Seed Analysis Committee was confined mainly to the study of a method for estimating lint on cottonseed which was submitted by Dr. David McNicoll, Chief Chemist of the British Oil and Cake Mills, Ltd., Hull, England, in comparison with a method which the Committee's report of May 1938 favored.

The method submitted by Dr. McNicoll reads as follows:

Delinting is affected by passing the current of dry hydrochloric acid gas over the seed contained in an ordinary 16 ounce oil sample bottle or a 500 c.c. wide-mouthed conical flask. 100 gm. of undelinted and 200 gm. delinted seed are taken for the estimation.

The delinting vessel carries a double-bored rubber stopper with a short tube and a long tube leading to the bottom of the vessel; the vessel is completely submerged in a water bath at 67° C.

For the gas treatment the necessary quantity of seed is packed evenly into the vessel. The longer tube is connected to the gas supply and the short tube is connected to the tube containing water for the absorption of the gas. 8 minutes is sufficient for the gas treatment, after which the delinting vessel is disconnected. The longer tube is then connected to a water pump and air is drawn through the vessel for a period of 30 minutes.

The seed is then transferred from the vessel to a weighed 20 mesh sieve, equipped with cover and bottom, and shaken vigorously. The completely delinted seed is then carefully separated from the lint which adheres to the sieve and the sieve is weighed with its contents.

The method which was favored by the Committee's report last May was:

The moisture of the seed is determined. 50 gm. portions are weighed and dried for 3 hours at 130° C. The seed are then placed in porous clay pots which have been treated with 2.5 cc. of conc. HCl and fumed for 1 hour at 130° C. All traces of lint are removed by brushing on a 20 mesh screen with an ordinary paint brush or by rubbing between layers of a soft cloth. The bald seed are dried over night and the weight recorded. The percentage moisture-free lint on moisture-free seed is calculated using this percentage, and assuming that the average moisture content of lint as 8%, the pounds of 8% moisture lint on as-is seed can be calculated.

$$\frac{50 - \frac{\%\ H_2O \text{ in Seed}}{2} \text{ —Wt. Dry Bald Seed}}{50 - \frac{\%\ H_2O \text{ in Seed}}{2}}$$

equals Moisture Free Lint on Moisture Free Seed.

$$\%\ Lint \times \frac{2000 - (20 \times \%\ H_2O)}{92}$$

equals pounds of 8% Moisture LINT per ton on As-Is Cottonseed.

The results of the comparative work on the above two methods and the opinions arrived at are as follows:

1. That the English method is the shortest of the two and would no doubt be more economical to use, particularly with reference to the time saved.
2. That the use of the English method shows a loss in weight on the treated seed — if this loss is accounted for in the lint the results will be true; if the loss is in both the lint and the seed the results will be in error.
3. That in the British method the treatment of the samples due to hydrolysis tends to change the composition of the lint and the moisture content of the lint, therefore causing the weight of the sample to be determined on an unknown basis.
4. That a standard type of acid generator be developed and that a factor be determined to correct for the loss in weight of the treated sample.
5. That the method favored by the Committee in 1938 should be shortened in time and that the amount of acid used in the treatment tends to be excessive.
6. That the method referred to in Item 5 above generally gives more uniform results and only assumes one factor — that of the average moisture content of the lint — while the English method as written leaves the determination of an unknown lint moisture basis and makes no allowance for the loss in weight after treatment, thus leaving more sources for error in the determinations.
7. That further study be made on the methods of determination of lint in the future and that further consideration be given to Dr. McNicoll's method.

Respectfully submitted,
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