

# Cottonseed Sample Preparation

## Simple and Ingenious Machine Suggested to Facilitate Quartering and Separation of Seed Sample

By G. S. MELOY, *Chairman\**

**T**HE difficulty in reducing or quartering a sample of cotton seed and maintaining its representativeness is doubtless fully appreciated by those analysts whose duties impose upon them the task. Some idea of these difficulties can be understood by those who are not familiar with cotton seed when we consider that fully matured ginned cotton seed of different varieties and growths vary in weight from 3 or 4 to 15 or 18 grams per hundred; that the residual fiber, chiefly fuzz, attached to the seed coats varies from absolutely denuded or slick seed to seed with 15 or 20 per cent of fiber; that the seed are not always fully developed so that the seed coats may be filled with kernels or they may contain only shrunken kernels or rudiments of kernels; that the seed are frequently aborted in early stages of development. In the usual method of quartering a sample of cotton seed, the sample is mixed in a cone-shaped pile, pressed down and quartered; opposite quadrants are remixed, piled and quartered until opposite quadrants are of the size desired for analysis. In this method it is practically impossible to maintain a thorough mixture or composite pile. Seeds of the different characters tend to segregate at every effort to mix the sample.

In the author's experience in cotton breeding work it frequently became necessary to count out one hundred seeds as a basis for calculating the relative value of selections or to rate the behavior of varieties grown under new environment. For this purpose it was the practice to spread the sample of seed from which the lots of 100 were to be counted, into a ribbon of a single seed in thickness and from three to five seeds in width. Thus laid out the countings could be made very rapidly. In his experience in quartering samples of cotton seed for chemical analyses it occurred to him that if the sample, instead of being piled, was spread out into a long narrow ribbon of a fairly constant width and thickness, and should this

ribbon of seed be split longitudinally, the probabilities would be that the two halves would be of the same composition of variables. With this thought in mind, the cotton seed sample reducing or quartering machine illustrated was devised. The two narrow belts "A" provide the means for drawing out the sample of seed into a continuous ribbon to be split by the divider "B", before falling into properly placed receiving boxes. The hopper "C" provides sufficient accommodation so that the sample to be divided may be fed into it by the hand-ful and so maintain a constant supply on the belts. Small tacks set in echelon protrude through the belts. These tend to drag the seeds forward and to center the stream of seed toward the divider. However, it was found that this tendency was not positive enough to assure exact division, but that when baffles "D" were placed in position and properly adjusted by the set screws "E" divisions were exceedingly accurate. Divisions of 1,000 grams of seed have been made, the two halves of which did not exceed 1.5 grams in error. In trial samples of known mixtures of slick, semi-slick and fuzzy seed, divisions have been made that were accurate within an error of not more than six slick seeds.

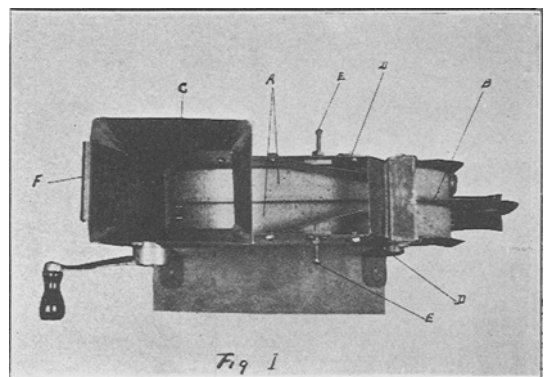


Fig. 1. COTTON SEED SAMPLE REDUCER  
Top view, cover of conveyor removed to show  
adjustment of baffles.

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## Cottonseed Samples

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The curved plate "F" (Fig. 1.) in the rear of the hopper beside preventing any back dropping of seed, apparently tends to cause a rolling of the seed in the hopper and possibly results in some mixing of the seed. As to size, the belts are  $\frac{7}{8}$  inch in width, the pulleys 3 inches in diameter and  $7\frac{1}{2}$  inches from center to center. The tacks protrude  $\frac{1}{8}$  inch through the belts. We operate the crank at a fairly constant rate of about 75 rpm. The apparatus is exceptionally simple and was constructed in this office by one of my assistants, Mr. F. S. Hubbard, from scrap material with the use of hack saw, a metal drill, pair of tin snips and a soldering iron.

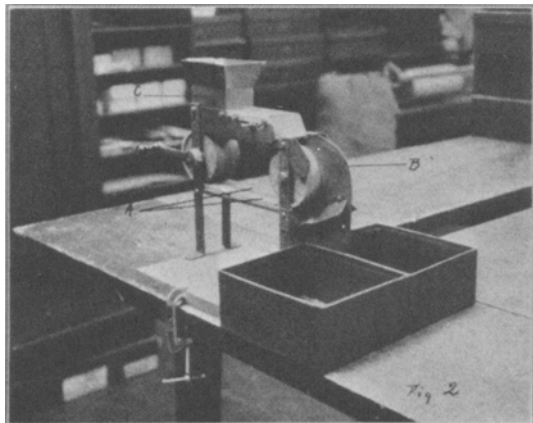


Fig. 2. COTTON SEED SAMPLE REDUCER.

Side view—showing machine in position for operation.

The machine is peculiarly adapted to the division of samples of cotton seed sent in under the revised rules of the National Cottonseed Products Association. These samples under the new rules are to weigh 1,000 grams. One-half or 500 grams is to be retained as a referee sample, a single division on the machine. Again dividing one half of the original sample gives two parts of 250 grams, a second division of one of these portions results in two parts of 125 grams each. One of these is available for Free Fatty Acid determinations and dividing the other results in two portions of approximately the size required under the rules for moisture and oil determinations.

## The Lipemeter

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The method as presented, has been thoroughly tested not only on a number of samples but on various portions of the same gross sample. The results are within 0.1 of 1% in the hands of various analysts. It is perhaps needless to point out that the simplicity of the manipulation permits the work to be done by a trained technician.

Acknowledgment is hereby made to Dr. C. P. Harris, of our Research Laboratory, for his work in the development of the process, and to his assistant, Mr. Manuel Horwitz, for his co-operation.

## Fat Composition and Uses

(From Page 341)

China wood (tung oil) trees, rubber seed, perilla and some other plants are being systematically tested. Yet, bearing in mind the wide climatic and agricultural resources of the Empire and the opportunity for opening up fresh tracts of cultivated land on these lines, progress within the Empire is all too slow, and the efforts already made by the Government Departments concerned to promote these developments deserve encouragement, but also require to be intensified and fortified by the close co-operation of chemists, biologists and agricultural experts.

## Tentative Official Oil Trier

THE Tentative Official Oil Trier (sampler) adopted at the meeting in New Orleans this year can be obtained complete from the Refinery Supply Company, Tulsa, Okla. at the price of \$35.00.

The committee suggests that all companies who have any use for oil sampling devices, purchase at least one of these Tentative Official Triers in order to enable us to collect data and opinions during the coming season. At the next meeting of the Society, this matter will again come up for definite adoptions or recommendations.

We very much appreciate your cooperation in connection with the above and wish to refer you to the Sampling Committee's report printed in the May issue of "Oil and Fat Industries," also the report of Uniform Methods Committee, "Oil and Fat Industries," June, 1930. Further details concerning the sampler may be obtained from the chairman.

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