IV. SEED TESTING PROCEDURES IN BRIEF

Sampling

The first requirement in seed testing is the careful taking of the sample. This should be done in a way that the sample sent for testing is a representative average of the larger bulk from which it is drawn. To achieve this, the I.S.T.A. rules prescribe certain empirical methods as standardized procedures for sampling the seed lot's contents. These generally involve the use of seed sampling instruments (triers) by means of which samples of seed can be drawn from various portions of the containers and heaps. The I.S.T.A. rules (para. 2)[1] and Chapter V dealing with "Sampling of Seeds for Testing" should be consulted for further details.

Seed Purity Analysis

The primary emphasis of the seed purity analysis in a seed testing laboratory is for physical purity. The separation of the seed sample into different portions such as pure seed, inert matter, other crop seed and weed seeds is done by an analyst.

Definitions have been developed, and are in use throughout the world, to help seed analysts be consistent in determining what shall be called pure seed, other crop seed, weed seed, and inert matter. The definitions drafted by I.S.T.A. (para 33) and recognized by all the members should be carefully studied and observed by the analyst.

Making the separation

The working sample should be examined quickly to determine if small inert fractions can be removed by sieving or if certain chaff and dirt might be removed by blowing. Screens of different sizes and a blower can greatly speed the purity analysis on some samples.

Following the preliminary separations, if they were made, the seeds should be placed on the clean surface of a purity work board and the necessary separations made with the help of forceps.

Weighing components and calculating results

Weighing of the individual components should be done on a Torsion balance, the Cent-o-Gram scale or an analytical balance. Weighing should be done to four significant figures. The number of decimal figures is determined by the weight of the largest component. (Fig. 48). The percentage by weight of each separation is determined by dividing the weight of the individual fractions by the total weight multiplied by one hundred. Chapter VII on "Purity Analysis" should also be consulted for additional details.

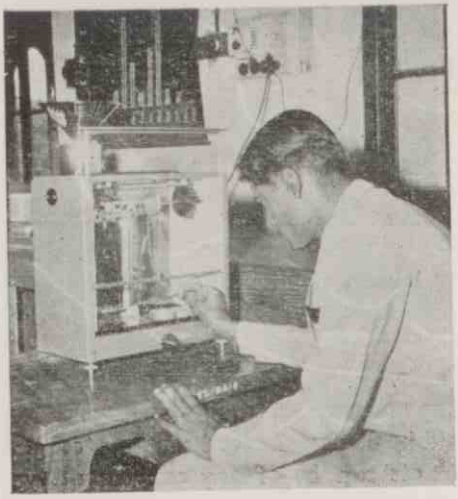

FIG. 48—*The chain-o-matic balance will weigh accurately to 4 decimal places.*

Germination Test

The ideal test for germination would be to sow the seeds in the field according to normal farming practice but this is usually not practical for two main reasons. Firstly, results of germination tests are always required before sowing time, and secondly, results should always be reproducible. Germination tests must, therefore, be made under controlled and standardized conditions which cannot be obtained in a field.

Field stand is generally lower than the laboratory germination because the conditions in the field are quite severe and usualy result in the loss of a certain percentage of otherwise live seeds. Laboratory tests do provide, however, the maximum germination potential of a seed lot.

In some places it is difficult to keep the temperature low enough under normal room conditions for satisfactory germination. If tests have to be carried out during such periods, a temperature controlled room or cabinet must be available. Special measures are taken for breaking the dormancy of seeds of species characterized by delayed germination. Germination is judged on the basis of healthy seedlings with well developed roots and plumule.

The health of seed in terms of freedom from seed borne diseases and pests is very important. When the attack is serious, it can be identified by direct examination of these samples, but when the incidence is low, although still capable of contamination, it is difficult to detect. Testing procedures have been developed for a number of important plant diseases and for detecting attacks and the presence of insect pests. This information helps in determining the need for seed treatment. At present the State Seed Testing Laboratories do not have the necessary facilities for determining seed health. Problem samples may be referred to the state pathologist or the Central Seed Testing Labortory.

Moisture Test

The moisture content of seeds is one of the most important factors influencing their viability in storage. It is desirable to know the moisture content of seed lots just after harvest or before storage as an aid to seed trade. For these reasons seed testing laboratories are often called upon to test seeds for moisture.

Measure Weight (Volume Weight)

Volume weight is usually expressed as the weight in kilograms of one hectoliter or the weight in pounds of one bushel. The volume weight is mainly used as an indication of the well filled seeds.

Storing Seed Samples

After the samples have undergone purity and germination tests, the remnant seed should be filed in the seed sample storage cabinets in a serial order. These cabinets can be of any convenient type. However, they should be rat proof. The purpose of storing these samples is for reference in case of questions or if a further analysis is required at a later date. Most samples may be discarded after one year.