job, but none have proved satisfactory for use on all types of soils.

A soil sieving machine developed at the Maine Soil Testing Service has operated very satisfactorily at the Maine laboratory for the past four years.

It consists of an endless belt, turning in a clockwise direction (figure 1-A), and running between two sets of rollers. The soil sample is placed on the moving belt at the left end, and is carried by the belt between the two pairs of rollers. These crush the clods into small aggregates. The soil then falls off the belt at its right end onto a screen (B). The screen fits snugly into its holder which in turn is connected to an eccentric. The eccentric agitates the screen and the soil rapidly, and the soil particles of sufficiently small size pass through the screen and are funneled into the sample container set below it. The screen is very easily removed for cleaning between samples.

Additional features of the machine are an adjustable belt tightener and a rotating brush to clean the endless belt as it passes underneath the rollers.

The framework of this machine was made of hardwood and ordinary metal belt pulleys were used for rollers.

Fig. 1.—Soil conveyed on the endless belt (A) is crushed by the two rollers and drops onto the screen (B).

Suggested improvements are: (1) addition of a gear reduction box to permit speed variation of the operation when necessary and (2) addition of springs to provide greater pressure between the rollers.

Construction drawings may be secured on request.—PAUL N. CARPENTER, Assistant Agronomist, Maine Agr. Exp. Sta., Orono, Me.

A DIRECT READING ELECTROPHOTOMETER

In a soil testing service laboratory it is necessary that color intensity readings be made rapidly and accurately. These readings are commonly made by comparisons of colors with standards by the eye of the technician.

Even though this method is rapid, severe eye fatigue is caused, leading to errors in determining results of analysis. Also, people’s vision varies, causing differences when two different individuals try to judge color intensities.

To help eliminate these errors a direct reading electrophotometer was developed for use in the soil testing laboratory (figure 1). The electrophotometer is similar to commercial models with three modifications: It is much less sensitive, thus permitting rapid reading of results; photocell and light source are housed so that racks containing 12 samples each can be pushed into the housing and the samples read in succession (see figure); the galvanometer dial has been calibrated against standards to give photocell readings directly in pounds of nutrient per acre.

These features of the modified electrophotometer speed up soil analysis, eliminate errors resulting from eye fatigue, and assure consistent analysis.

Further information regarding the direct reading electrophotometer can be secured from the Maine Agricultural Experiment Station, Orono, Me.—PAUL N. CARPENTER, Assistant Agronomist, HERBERT S. INGRAHAM, Formerly Technician, Maine Agr. Exp. Sta.

AN EMASCULATION TECHNIQUE FOR CERTAIN SPECIES OF TRIFOLIUM

In view of the varying capacity shown by individual plants and species of the genus Trifolium to set seed by self-pollination, it was considered necessary to explore the possibilities of developing an emasculation technique for use in critical crosses. In interspecific hybridizations involving a self-fertile species as female, emasculation becomes essential, and owing to the small number of ovules per carpel in the species, the method needs to be simple and rapid to enable a large number of pollinations to be made in an attempt to overcome the extremely low inter-species compatibility that prevails in the genus.

Several workers have described methods which are applicable to members of the Trifolaeae. Tysdal and Garl (1940) have described a chemical method for the emasculation of flowers of Medicago sativa, which consisted of sterilising the pollen grains by immersing the flowers for 10 seconds in 57% ethyl alcohol. Atwood (1941) working with Trifolium repens, used a method which was also successful on Melilotus, and which involved extraction of the anthers by means of suction through a fine jet. Both these methods have their disadvantages and their use is somewhat limited. The methods described here have been