(6) *Breastwork at a Naval Base.*—Samples were obtained from the harbour bottom for calculating earth pressures against sheet piling of a breastwork:

(7) *Housing.*—At the request of the Housing Department tests were made of the permissible loading for safety for the foundations of a community centre.

Work for other Departments.—Practically all projects mentioned above except the general surveys and the detailed soil mapping of districts were carried out for other Departments or branches of this Department. Some additional tasks are mentioned below:—

Report on the soils of Huntly district for the Organization for National Development; advice to the Department of Agriculture and Lands Department on the development of several blocks; report on the soils of Mangonui area in relation to forestry for Forestry Department; soil maps and lime requirement of several Native development areas for the Native Department; notes supplied concerning soil conditions both to the Education Department and to the Auckland Education Board on various sites for the proposed agricultural high school in North Auckland; report on Kaingaroa flax area for Industries and Commerce Department; soil maps for the Valuation Department; a report for the Public Works Department on the lagoon area adjoining the Wairarapa Lake in regard to the suitability of the soils for drainage; and a survey of aerodromes for Aerodromes Branch of Public Works Department.

TOBACCO RESEARCH

Advisory Committee.—Sir Theodore Rigg (Chairman), Messrs. F. R. Callaghan, L. J. Schmitt, H. L. Wise, W. K. Dallas, N. J. Adamson, E. M. Hunt, C. C. Nash, F. A. Hamilton, B. Jenkins, N. Rowling, and R. Thomson (Director of Station).

During the past year four meetings of the Tobacco Research Committee have been held to consider programmes of work and reports presented by officers associated with tobacco research, and to advise on policy matters connected with the development of the tobacco industry and the progress of the Research Station.

A small kiln was erected for experiments in fire curing tobacco. A new soil-sterilizing plant was installed during the season. This consisted of a 12 h.p. steam boiler, together with concrete bins large enough to hold 40 cubic yards of soil at one time.

Climatic conditions during the past growing season were in the main abnormal. Temperatures during the spring and early summer months were much below the average, and even right through the season night temperatures were relatively cool. Sunshine was also less than usual. On the other hand, rainfall was unusually high, averaging about 5 in. per month. This was the first season on the Station that it was not necessary to resort to irrigation during the mid-summer period. It is anticipated that the yield will be about the average of previous seasons. The colour of the leaf is good, but the leaf is somewhat lacking in body. The 1943–44 crop was the heaviest so far produced, being 18,243 lb. from 14 acres, and was sold at an average price of 2s. 5d. per pound.

The new steam sterilizing plant proved a great success. In addition to the Station soil, 150 cubic yards were treated for private growers. This quantity would have been greater had the new boiler been obtained earlier in the season. Growers are increasingly realizing the benefits accruing from the use of steam-sterilized soil in the raising of healthy seedlings, and the indications are that the use of steamed soil will greatly increase during the coming season.

The research work this season, as in previous years, has been a co-operative effort carried out jointly by the staff of the Research Station and officers of the Cawthron Institute. The Research Station has concentrated on the field side, which has included all types of fertilizer investigations, variety trials, seed-production work, plant-breeding, and mosaic investigations. The Institute work has included tobacco-disease surveys, investigations into the control and spread of various diseases, chemical studies dealing with the intake of plant nutrients, the chemical composition of cured leaf, and chemical analysis of leaf from the field trials at the station. The soil survey of the Waimea Plains has been continued with a view to the expansion of the tobacco industry.

Fertilizer Experiments

In considering the results from the fertilizer experiments from the 1943–44 season it should be borne in mind that the season under review was very dry during the early summer, followed by heavy rain which caused surface flooding. Where the quantity of fertilizer per acre was varied by 200 lb. intervals from 800 lb. to 1,400 lb., 1,200 lb. per acre gave the best return. The additional fertilizer appeared to increase leaf size, while quality remained fairly uniform throughout. Although 1,400 lb. gave a further increase in yield, it was not sufficient to offset the additional cost of the fertilizer. These results confirm those of previous seasons, and support last season's recommendation of 1,200 lb. per acre for soils of the Station type. In a new experiment dealing with varying percentages of nitrogen and potash in the fertilizer there were no outstanding differences, although the general tendency of heavier growth with increasing quantities of nitrogen was evident. The higher proportions of potash were responsible for smoother leaf.

Where different types of phosphate were applied at the same rate per acre a difference was recorded for the first time, superphosphate outyielding both basic super. and serpentine super. The addition of dolomite had a beneficial effect on both yield and quality. In the rotation experiment comparing continuous tobacco with tobacco following rye-corn ploughed under, there was no significant difference in yield or quality.

Where different methods of applying the fertilizer were tried out, the heaviest yield was obtained by placing all the fertilizer in the furrow before planting. The usual method of applying half the fertilizer in the furrow and broadcasting half shortly after planting (which has proved the best in previous seasons) gave the next highest returns. The plots receiving the fertilizer in side bands were slow to come away, and although they made up some of the difference they were definitely lower in yield. This was confirmed on a field scale using a commercial fertilizer drill.

In an experiment where nitrogen was supplied in various forms the results were in striking contrast to those of the previous season. In the dry season under review the most readily available forms, particularly nitrate of soda, gave the best results combined with high-quality leaf, whereas under the wet conditions of the previous season the organic forms of nitrogen produced the best yield and quality.