REPORT OF COMMITTEE ON BREEDING TOBACCO.

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OBJECTS: To investigate and report on methods and technique of breeding tobacco; and to encourage the production of improved purebred types of tobacco for the various areas which grow or may grow specific types of tobacco as demanded by the various markets.

(Report submitted by the Chairman.)

It has not been possible for the Committee on Tobacco Breeding to meet together and prepare a general report on the progress of this work in the different tobacco districts where breeding investigations are being conducted. In view of this fact it has been agreed, by correspondence, that the report of this committee be confined to individual papers, giving outlines of the methods found to be most satisfactory, these papers to be published as the committee report. Owing to the widely varying conditions in the different tobacco districts, particularly the character and quality of the tobaccos produced, the methods of breeding must of necessity vary according to the particular improvements sought. The highly specialized nature of the tobacco industry is such that the development of methods of breeding, and the actual work of improvement, can only be satisfactorily carried on by breeders having a special knowledge of the conditions and practical experience in the culture, handling, and marketing of the crops.

In view of the fact that tobacco breeding experiments have only been carried on for a few years, the methods of breeding are not fully worked out as yet, and it is hoped that as a result of the work of this committee, improved methods may be developed.

The methods of saving seed under bag free from cross fertilization, and seed separation developed as a result of the tobacco breeding experiments, have been generally adopted by tobacco growers, and have proven to be of great practical value in the production of improved strains of tobacco and increasing the profitableness of tobacco growing. Methods of judging the plants in the field and the cured and fermented leaves in the warehouse or laboratory have been worked out so that tobacco growers and breeders can more intelligently select the best types of plants for propagation. One of the most important steps in this connection has been the invention of apparatus for testing the burning qualities of cigar tobaccos. The arrangement of score cards for the comparison of physical characteristics of the fermented leaves, of both cigar wrapper and filler tobaccos, has been undertaken and considerable progress

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has been made in devising a satisfactory plan for definitely scoring the products of the individual plants.

The discovery of the variability of the nicotine content of different plants, has opened a most interesting field for breeding strains of tobacco of high and low nicotine content. Experiments have been undertaken in Connecticut, Ohio, and Florida to determine the possibility of securing varieties of tobacco with a low percentage of nicotine, but retaining the qualities of flavor and aroma to be desired.

A nematode-resistant strain of the Uncle Sam Sumatra tobacco has been produced in Florida by breeding. In view of the widespread and increasing loss due to the presence of the nematode in the shade fields of Florida and Georgia, this resistant strain is of tremendous importance to the tobacco industry of this section. Several new and improved Florida varieties have been tested the past season on an extensive scale, with most satisfactory results. The increase in yield due to the use of the improved tobaccos has amounted on the average from 200 to 450 pounds per acre, and the proportion of high-grade wrappers increased about 20 per cent.

In Texas and Alabama acclimated strains of Cuban filler tobaccos are being developed by seed selection. Owing to the effect of the change of soil and climatic conditions, the imported Cuban variety has been found to break up in type when grown in Texas and Alabama, and many of the types are unproductive and undesirable. It has been found that by saving the seed of the best plants under bag, and propagating this seed in Texas under favorable conditions, the yield per acre of the filler tobacco can be increased from an average of about 400 pounds to an average of about 800 pounds per acre. The quality of the crop grown from the improved strains is better than that of the unimproved types.

In Maryland the results of the breeding work begun in 1904 have been very striking and important. Several improved strains of the native tobacco have been produced by seed selection, and a new variety the result of a cross of the Maryland tobacco and the Connecticut Broadleaf variety, have given increased yields of an improved quality of tobacco. Seed of these improved varieties have been distributed to the growers in response to their requests, and have generally given most satisfactory results.

Tobacco breeding investigations are now being conducted in the cigar wrapper districts of the Connecticut Valley, Florida and Georgia; in the cigar binder and filler district of New York; in the cigar filler districts of Ohio, Texas and Alabama; and in the smoking, plug, export or heavy tobacco districts of Kentucky, Tennessee, Maryland, and Virginia. In Connecticut, Maryland, Kentucky, Ohio, and Virginia the breeding work is conducted cooperatively by the State experiment stations of these States and the U. S. Department of Agriculture, while in Florida, Georgia, Texas, Alabama, and New York the breeding investigations are carried on by the
Department with individual tobacco growers. The active cooperation of the Department of Agriculture and the State experiment stations has been found to be the most effective means of achieving breeding results, and in the introduction of the improved methods by breeding and seed selections. It is hoped that practically all of this work can be carried on cooperatively wherever the conditions make it possible to do so.

The experimental tobacco breeding fields in the different districts have for the most part been located where the conditions are most favorable for the production of the established varieties, and with successful and progressive farmers. In this way it has been possible to carry on the breeding experiments under normal conditions and where the results have applied to practical farm conditions. The growers with whom this work has been conducted have for the most part become interested in the breeding work to such an extent that they have begun systematic tobacco breeding work on their own account. In many cases growers have set aside breeding fields for the production of seed of improved varieties on a commercial basis, so that reliable sources of seed are being established.

In following out the policy of presenting individual papers as the committee report, the following three papers are submitted:

TOBACCO BREEDING IN THE CONNECTICUT VALLEY.

By J. B. Stewart, Tariffville, Conn.

The Connecticut Valley tobacco district includes all of the tobacco sections in the New England States and that part of New York State known as the Housatonic Valley. This district grows annually about 22,000 acres of tobacco, producing approximately 38,000,000 pounds, having a valuation in round numbers of $6,000,000.

CLASS OF TOBACCO PRODUCED.

The class of tobacco produced in this district is cigar wrapper, and the value of the product is determined by the percentage of cigar wrappers of good quality the crop contains. The growers, therefore, spare no expense in fertilizing and cultivating the soil to produce the highest quality of tobacco possible. In this district are grown many varieties of tobacco, each differing in some minor characteristic from the others, but, as far as plant breeding is concerned, the class of cigar-wrapper tobacco can be divided into two groups: (1) The native tobaccos, which are grown in the open; and (2) the foreign tobaccos which are grown under shade.

The native tobaccos have been grown in the Valley for a great number of years, and the types are well established with the exception of the variation due to cross pollination. This variation has been easily overcome by the method of seed selection under bag. The foreign tobaccos were introduced into the Valley by seed from

\*This method is fully described in Bulletin No. 96, Bureau of Plant Industry, U. S. Dept. of Agr.