

from the time of steam sterilization to the actual sowing of the seed. The steam-sterilized soil gave superior results to the unsterilized soil. In the latter case germination of tobacco-seed was reduced, growth of seedlings was slow, and foliage colour was poor.

Seed-germination Tests.

As in former years, germination tests have been made of the seed used by the companies for commercial plantings. The tests showed a variation in different lines of seed from 63 per cent. to 94 per cent. germination. In addition, germination tests have been conducted on five varieties of seed stored for two years and on two varieties of seed stored for three years. The results showed 65 per cent. to 99 per cent. in the first case, and 93 per cent. to 96 per cent. germination in the second case.

Effect of Disinfection on Seed-germination.—The effect of both rectified spirit and absolute alcohol on the germination of tobacco-seed has been examined in collaboration with the Tobacco Research Officer. The results show that no harmful effect on germination is obtained by immersion of tobacco-seed in either of these disinfectants for periods of five to ten minutes. Even when the drying of the seed, after immersion in these reagents, was delayed for thirty minutes no significant decrease in germination resulted.

During the course of the tests, however, it was noticed that if the tobacco-seed was not properly aired after treatment with rectified spirit a marked reduction in germination occurred.

The following figures illustrate the importance of thorough airing of tobacco-seed after treatment with rectified spirit :

| Treatment. | Percentage Germination. | |
|-----------------------------------|-------------------------|---------------------|
| | End of First Week. | End of Second Week. |
| Seed aired | 12 | 86 |
| Seed not aired | 2 | 49 |
| Control (not disinfected) | 3 | 73 |

Further experiments conducted with alcohol, silver nitrate, and Uspulun have shown that, provided airing and subsequent storage of treated seed are satisfactory, no adverse effect on germination results if the treated seed is held in storage for periods up to sixteen months.

Tobacco Wilt.—Several cases of wilt in tobacco have been observed in two localities during the present season. They appeared to be associated with low-lying areas where soil conditions were rather wet. The wilt is characterized by a yellowing of the leaves on the lower half of the plant. On individual plants, yellowing begins at the tip of the leaf and gradually advances to the leaf stalk, finally affecting the whole surface of the leaf.

Both bacteria and the fungus *Verticillium* occur in the affected plants, the former chiefly in the root and base of the stem and the latter in the stem and wilted leaves. No statement can yet be made as to the cause of the wilt.

PHORMIUM RESEARCH.

Investigations in connection with the phormium industry during the year were confined to two main activities :—

- (a) Botanical investigations under the control of the Botany Division of the Plant Research Bureau. These are reported upon briefly on page 15.
- (b) Mechanical Investigations: Work was concentrated upon improvement of the design of the washing-machines now in use in flax-mills, but after extensive trials were carried out the modifications made were found not to be feasible, and the work has therefore been discontinued.

The first installation of the flax-stripping machinery is now being made and will enable these locally designed and constructed machines to receive thorough testing under commercial conditions.

TIMBER PROTECTION RESEARCH.

Timber Protection Research Committee.—Mr. L. E. Brooker, State Advances Corporation of New Zealand (Chairman); Mr. R. L. Andrew, Assistant Dominion Analyst; Mr. F. J. A. Brogan, Assistant Secretary, Department of Scientific and Industrial Research; Mr. F. R. Callaghan, Chief Executive Officer, Plant Research Bureau; Dr. G. H. Cunningham, Director, Plant Diseases Division, Plant Research Bureau; Mr. H. C. Gayford, Chief Inspector, Housing Construction Department; Mr. N. A. Marris, Dominion Laboratory; Dr. D. Miller, Entomology Division, Plant Research Bureau; Mr. A. F. Clark, State Advances Corporation (Secretary).

The Timber Protection Research Committee, set up in June, 1938, by the Council of Scientific and Industrial Research to direct investigations relating to the preservation of timber from the attacks of insects and fungi, has had to devote special attention this year to the problem of termites in New Zealand. During the year the Committee arranged for the visit from Australia of Mr. F. N. Ratcliffe, of the Division of Economic Entomology of the Commonwealth Council of Scientific and Industrial Research, to report on the termite position in New Zealand. Mr. Ratcliffe presented a report on