

Progress in different branches of the investigations is indicated below :—

EASTON AREA.

As a result of extra grants made available during the year, the area planted in special strains has been increased approximately from 25 acres to 47 acres. The main varieties now represented and the areas planted with them are roughly as follows :—

	Acres.		Acres.
Ngaro	20	No. 56	1
S.S.	7	No. 313	1
Paretaniwha	7	No. 314	1
No. 273	3	Ngaro × S.S. hybrids	1

The other varieties, which are in smaller quantity, include Nos. 301, 302, 310, 311, 312, 315, &c. All the varieties with numbers above 300 were new to this work during the year, and include some particularly promising ones, such as Nos. 301, 311, and 313. These were found in the course of searching conducted to find plants for the 22 acres planted during the season. The varieties S.S. and Paretaniwha, of which we now have 7 acres each, yield fibre of particularly high quality. Further supplies of suitable plants were found which should be sufficient to plant from 60 to 100 acres, if these plants can be procured. If the industry is to cater for a market demanding higher quality, these, and if possible other plants, should be secured and propagated as rapidly as possible.

Growth of the plants in the Easton area has been good, particularly in the newly planted area. This is probably due to the very wet summer, which has also promoted abnormal weed-growth and rendered cultivation very difficult. As a result of experience in this area, it is felt that tall fescue (*Festuca arundinacea*) is by far the worst weed of cultivated as well as of natural *Phormium* areas in the district. Experiments on controlling it by grazing with sheep should be initiated.

Flood damage was suffered in June, in the highest flood which the Manawatu has experienced for several years. The bank is now in much better order than at any time since we took possession. Considerable willow-planting has been carried out to protect the more exposed parts from severe wave action.

COLLEGE AREA.

The Ngaro fibre, mentioned in last year's report, won high praise from overseas spinners, and a quantity has now been sent to the Imperial Institute, London, for complete rope tests. A bale of S.S. fibre is also being sent, and smaller quantities from varieties 56 and 313, all of which are expected to give better results than Ngaro in strength tests.

Milling tests, as anticipated last year, were carried out in May and June by Messrs. Ross, Rough, and Co., Ltd., Foxton, to whom the greatest thanks are due. The milling of a hundred or so samples of leaf, which must be kept separate through all processes, is an exacting task, and causes much loss of time in a commercial mill.

The leaf tested came from plants of three types, namely :—

- (a) Pedigree plants resulting from the inbreeding of good varieties, such as Ngaro, S.S., No. 212, No. 37, No. 22, Paretaniwha.
- (b) Varieties collected and grown on the College area but previously not tested.
- (c) Hybrids between some of the good varieties, such as Ngaro × S.S., and Paretaniwha × S.S.

Particularly pleasing results were obtained from plants in groups (c) and (a). Over thirty plants tested were Ngaro × S.S. hybrids, and almost without exception these gave heavy, strong fibre of very good colour, possessing a better combination of desirable qualities than the fibre of either parent. In addition to appearing thus to combine the better fibre characters of each parent, these plants are also vigorous and tall in their growth, thus overcoming the objection to the better fibre plant (S.S.) of the parents that it is somewhat short of growth.

It must be emphasized that the hybrid plants which were milled had previously been selected from a larger number by hand-stripping tests. Nevertheless, it can confidently be said that, with reasonable culling at the nursery stage, hybrids between Ngaro and S.S. will crop heavily and produce fibre which, in quality, is much above that obtainable from natural stands of *Phormium*.

These hybrids can readily be produced in large numbers, and seem particularly suitable for such commercial planting as must be done before large supplies of vegetatively propagated plants are available. About 100,000 have already been grown for commercial planting. Unfortunately, the past summer was remarkable for the fact that *Phormium* flowering was extremely sparse, and it was impossible to cross these varieties. In the coming summer, given temporary assistance, it should be possible to produce hybrid seed sufficient for 500,000 to 1,000,000 plants. This estimate is based on the expectation that 1 per cent. of the Ngaro plants at the Easton area will produce flowers.

The hybrids mentioned above (Ngaro × S.S.) produce fibre of the general type which has been sought in past years—easily cleaned, of good colour and strength. As mentioned above, present-day trends are towards the employment of *Phormium* as a "semi-soft" fibre, and it is therefore desirable to investigate the production of finer-fibred varieties and hybrids. In the last annual report it was recorded that hybrids between Paretaniwha and S.S. had given especially good results in fineness, combined with other good features of fibre and growth. Unfortunately, these two varieties are not so easily crossed as Ngaro and S.S. The proportion of plants with poor fibre in the hybrids is also high. For these reasons it appears improbable that these hybrids can be supplied as seedlings for commercial planting. Selected seedlings can be and are now being multiplied vegetatively for ultimate commercial use.