

## PASPALUM.

*Single Plant Study.*—From observations made on single plants raised from commercial Australian and New Zealand samples it would appear that there is very little variation between New Zealand and Australian lines.

## AGROPYRON SPECIES.

During the year a number of inquiries relative to the above have been received. Eleven lines of various species have been planted out as spaced single plants and these are being tested for their suitability for New Zealand conditions. The following species have been recognized: (1) *A. cristatum*, (2) *A. tenerum*, (3) *A. Smithii*, (4) *A. divergens*. *A. Smithii* may be regarded as a possible danger on account of its strong rhizomatous growth and its coarse foliage; it has nothing to commend it. The remaining species, while not dangerous, cannot yet be regarded as promising fodder or lawn grasses. Broadcast trials under dry, arid conditions are necessary before these species can be viewed as worthy of much consideration.

## WHITE CLOVER.

*Certification Trials.*—Four hundred and fifty-seven lines sown in the spring of 1931 have been finally reported on; 550 plots were sown in the spring of 1932 on the Station area. Within eight months of sowing definite and final reports have been issued on all except forty-three of these last-mentioned plots. This autumn a further thirty-five plots have been sown.

*Original Broadcast Trials.*—After three years of close study this experiment has been finalized. Throughout the whole term of the trial the New Zealand certified types were outstanding.

*Single Plants.*—Of the original 4,000 plants planted out in November, 1929, the ten best have been kept and used to build up a selected line now being multiplied. This original single-plant study has now been finalized. From the 3,460 single plants from superior lines previously tested seventy-one plants have been selected and planted out under the tiller row and single-plant system. A total of eighty-nine plants, all exceptionally good, has been put under this system of testing. Eight hundred and twenty individual white-clover plants were studied through the seedling stages to determine how soon type could be identified from the seedling stage onward.

*Elite Strain Production.*—Four separate elite lines have been seeded. Plots from these lines are proving superior to ordinary mother-seed lines, the best of these being 45 per cent. better than a standard certified mother-seed line. This selection has yielded a very good seed crop, which will be sown out, for further seed production, at the Pure Seed Station, Lincoln.

*Genetical.*—During the late spring and early summer thirty-three pairs of plants were caged, a pair to each cage, at flowering time, and reciprocal crossing was carried out by introducing humble bees. Eight of these crosses consisted of pairs of plants superior in performance and alike in growth form. These crosses are intended to test the breeding abilities of the parent plants. Seven crosses were carried out with pairs of plants of similar type and similar HCN value in order to study the inheritance of HCN content in the plants resulting from the crosses. Four types of crosses have been made—namely, (1) good type plants high in HCN content, (2) good type plants low in HCN content, (3) poor type plants relatively high in HCN content, (4) poor type plants relatively low in HCN content. The remaining eighteen crosses completed consisted of crossing each of our ten best plants with one of three other plants. Owing to differences in flowering times, and insufficient cages, it was not possible to complete the thirty crosses as originally planned. The seed resulting from the successful crosses has now been sown out in boxes under glass frames, and later the seedlings will be planted out as single plants for further study and selection.

## RED CLOVER.

*Certification Trials.*—Seventy-five lines of red clover have been sown. The majority of these lines are imported Montgomery lines or once-grown Montgomery lines which have come in under test for certification purposes. Reports have been issued on most of these lines which were sown in the spring.

*Single Plants.*—In September 1,600 seedlings were planted out as spaced plants. These represent three lines—two Station-selected lines and a good commercial line. These have been put out as a possible source of superior plants suitable for later strain building. At the same time a further 900 plants were put out. These consisted of 100 plants of nine different lines. Three of these were mother-seed lines, and the other six consisted of two first-harvest lines grown in New Zealand from one or other of the three mother-seed lines. The mother-seed line has been planted between its respective first-harvest lines so as to aid the comparison of the mother-seed lines with their first-harvest progeny. A note on the types of growth forms occurring in these lines has been taken. In August the best 109 plants of the extra later-flowering type in the 2,200 single plants put out in May, 1930, were picked out and replanted on the Station area.

*Elite Strain Work.*—The seed harvested from the seventy plants selected and planted in a block on the Station area has been sown broadcast and as single plants. A heavy seed crop has been harvested from the spaced single plants, and this will be available for field plot work. The plots of this line under trial are proving to be very dense, more leafy, and better producers than the average commercial mother-seed Montgomery lines. After seeding, some of the seventy plants died, so the remainder were blocked together, and to these were added the 109 plants selected from the 1930 plantings. This block was allowed to seed this year, and this crop will be tried out further as an elite strain.

*Genetical.*—Four exceptionally good plants have been crossed in pairs, in each possible combination of pairs. The seed harvested will be sown, and the progeny will be closely studied.

## SUBTERRANEAN CLOVER.

The block of fifty plants of each of twenty lines planted out last year was seriously spoilt by flooding, so this block has been discarded and a fresh series has been planted out under better conditions. Three more lines have been included in this single-plant trial. The trials so far have shown the existence of important strain differences. A small block of single plants of a dense leafy line was grown for seed, and a very good crop has been harvested. This will give a good supply of seed for further trials.