

The following is the record of rainfall and temperature for the year:—

Record of Rainfall and Temperature at Waiotapu Plantation.

Month.	Rainfall.	Number of Days Rain fell.	Highest Reading of Thermometer.	Date.	Lowest Reading of Thermometer.	Date.
1901.	Inches.		Degrees.		Degrees.	
April ...	1.16	11	76	2nd	22	11th
May ...	1.20	6	64	3rd	20	26th
June ...	6.25	19	62	19th	20	26th
July ...	7.74	14	56	19th	18	16th
August ...	5.88	11	64	31st	18	4th
September ...	2.68	11	68	26th	24	20th
October ...	2.15	11	76	28th	22	8th
November ...	0.71	6	78	27th	26	25th
December ...	4.54	14	82	28th	34	18th
1902.						
January ...	3.28	12	92	19th	32	25th
February ...	5.09	7	89	2nd	32	18th
March ...	6.76	10	80	3rd	28	15th
Totals ...	47.44	132				

KAINGAROA PLAINS PLANTATION (EXPERIMENTAL), ROTORUA DISTRICT.

On the four separate enclosures (in all 25 acres) the trees which have proved unsuitable for the trying climate of these plains were removed, after which some five thousand conifers remained. The whole area was then cleared of tussock, and pits were made at 4 ft. 6 in. apart, in which 44,275 trees, comprising spruce, English birch, and three varieties of pines, were planted. Birch and *Pinus insignis*, being fast-growing, were planted in the form of a break-wind around each enclosure.

The loss in transplanting amounted to 10 per cent. all round, but in this locality, where late spring frosts and high drying winds are so prevalent, the rate is not a high one.

The individual specimens of larch, Oregon pine, and Norway spruce planted in 1898 have made splendid growth during the year, the last-named species succeeding better here than in any other locality yet tried in the hot-lakes district. Some of these are grand specimens 6 ft. in. height, and during the season have made fully a foot of upright growth, with horizontal growth in proportion, which is more than the average with this somewhat slow-growing tree, especially in a high and exposed position. Larch have made in some instances quite 3 ft. in vertical growth, and Oregon pines have averaged over 2 ft.

EXPERIMENTAL GRASS Paddock, RANGITAIKI, KAINGAROA PLAINS.
(Area, 50 acres.)

Some thirty-five species of grass and fodder plants were sown here in October, 1897, for the purpose of testing their growth on this barren pumice land. Although no very satisfactory results were anticipated at the time of sowing—owing chiefly to the extremely poor and light nature of the soil and the rather high elevation (2,500 ft.)—the result of four and a half years' experiment goes to prove that no grass or fodder plant at present in cultivation in this colony will succeed here. On this extensive wind-swept plain extreme frosts seem to play an important part in the non-success of these experiments. After heavy rains the open, porous nature of the land allows the frost to penetrate to a greater depth than the roots of any of the grasses sown reach to, and the soil to this depth is thus lifted by expansion and sunk again by contraction as the temperature rises, leaving the individual plants either on the surface if small, or raised up above their natural level if large. It is obvious, therefore, that a succession of frosts will eventually throw out of the ground any plant whose roots do not descend below the level that frost affects. That this statement is correct can be proved conclusively by observing the vigorous and healthy growth of the native *Poa australis*, var. *laevis*, compared with less robust and more shallow-rooting grasses experimented with. The former plant has a very deep root system reaching below the level affected by frost, and is thus undisturbed by the alternate rising and falling of the top soil, whereas the exotic species are affected as before mentioned.

On the sides of roads and along the numerous horse-tracks where the soil is consolidated by tramping, many exotic grasses and clovers flourish luxuriantly, as on these parts rainfalls do not saturate the top soil to such a degree as the untrampled portions, and consequently frosts do not penetrate to such a depth. Want of consolidation is therefore the primary cause of failure of grasses on these plains. It is practically impossible to consolidate any extent of these plains by means of tramping with stock, as there is no available food to sustain them meanwhile, and the cost on cartage of fodder from long distances (as would be necessary here) is prohibitive.

It has been asserted by visitors passing through this country that if grass and clover grow on the horse-tracks with such good results the whole plain could be made similarly productive. It must, however, be remembered that this growth in such places is the result of many years of consolidation by the droves of wild horses frequenting the plain, and, as I have pointed out, this result would be practically impossible by any other means.