

The following summary illustrates the measure in which forestry operations have assisted in relieving unemployment during the past three years throughout the Dominion.

TABLE 10.

SUMMARY OF LABOUR COMPLEMENT EMPLOYED DURING THE PAST THREE WINTER PERIODS.

Month.	1926.			1927.			1928.		
	Number of Unem- ployed.	Number of other Labour.	Total.	Number of Unem- ployed.	Number of other Labour.	Total.	Number of Unem- ployed.	Number of other Labour.	Total.
May	50	319	369	60	368	428	340	402	742
June	98	331	429	120	360	480	630	403	1,033
July	137	308	445	330	320	650	720	468	1,188
August	158	321	479	460	326	786	740	499	1,239
September	164	319	483	480	324	804	880	415	1,295
October	128	284	412	140	325	465	530	379	909

These figures do not include the permanent field staff of some seventy controlling officers, but include the semi-permanent standing labour complement of from four to five hundred men who are employed practically all the year round upon general maintenance work, fire patrol, &c., in the summer, and during the winter period form the basis of planting crews as foremen, leading hands, &c.

CHAPTER III.—RESEARCH AND EXPERIMENTS.

1. FOREST ENTOMOLOGY.

The past year has been marked by several outstanding changes of organization, and will probably in future be regarded as the beginning of intensive forest entomological research work. Dr. David Miller, the Government Entomologist, attached to the Agriculture Department, who had been giving his services for forest entomological work as an addition to his normal duties, was appointed to the staff of the Cawthron Institute, and shortly afterwards, Mr. A. F. Clark, Dip.For., who had been working for the Forest Service during part of the previous year under Dr. Miller's direction in Wellington, was transferred to Nelson. Fortunately, however, arrangements were made with the Cawthron Institute, whereby Mr. Clark's work would still be carried out in conjunction with Dr. Miller, and it was thus possible for the Forest Entomological Officer to have full facilities for use of the laboratories, library, and insectaries of the Cawthron Institute, and to keep in touch with all allied lines of research which are going on there. This is an extremely satisfactory arrangement, and cordial thanks are due to the Cawthron Trust Board and to the Director of the Institute for the very complete way in which they have assisted the Forest Service in this matter.

The work that has been carried on has consequently extended from the previous matters of routine identification and general surveys of insect conditions, and the following definite programmes have been put in hand: (a) Systematic examination of all tree-seeds imported for the Forest Service; (b) an intensive forest survey from the insect point of view; (c) a systematic examination of imported hardwood poles.

Besides these matters actual contact has been maintained with the whole of the parasite work carried out by the Cawthron Institute, including, what is most important from the Forest Service point of view, the introduction, rearing, and liberation of the ichneumon parasite of wood-wasp (*Sirex juvencus*).

Results to date prove clearly that insect-life is freely imported with all tree-seed. Very few lots were found to be absolutely free from infestation, and it was definitely established that the chips and litter that are present in most seed lots are as great a source of danger in this respect as actual seeds. The source of danger in imported poles, particularly in unbarked poles, was proved beyond shadow of doubt.

The forest insect survey was completed for (a) the northern portion of Canterbury; (b) Taranaki to a line twenty miles north of New Plymouth; (c) portion of Nelson Province.

The conclusions to be drawn from the survey to date may be expressed in general terms as under:—

- (1) The silvicultural conditions obtaining in privately and publicly owned plantations are unsatisfactory, and from the entomological viewpoint they are extremely unsatisfactory.
- (2) The factors affecting the attack of *Sirex juvencus* are: (a) Site; (b) silvicultural condition of the stand; (c) probable fungus attack; (d) attack by *Chermes pini*.
- (3) The attack of *Chermes pini* is more serious than is usually supposed.
- (4) The life-cycle of *Chermes pini*, from field observations, does not follow the European cycle. The apparently slow spread of *Chermes pini* is probably caused by the absence of winged migrants, the insect reproducing continuously upon pines.
- (5) The growing of spruce in New Zealand is not possible without *Myzaphis abietina* being controlled and greater care being exercised in choosing the site for this tree.
- (6) The growth of eucalypts in New Zealand is becoming increasingly difficult, and work upon the major pests should not be relaxed.