

## PROGRESS OF GULF STATES PINES AT WAIPOUA.

(A. D. McKinnon.)

Trial plantings at Waipoua, North Auckland, include the four species of southern yellow pines, or Gulf States pines, *P. palustris* (longleaf), *P. echinata* (shortleaf), *P. taeda* (loblolly), and *P. caribaea* (slash pine).

The first planting of these species was made in 1926, on soil which varies from a sandy loam to a heavy clay, with an ironstone pan at a varying depth below the surface.

Judging from the remains of wood in the ground, and the way in which the ground has been dug over for gum, kauri was once very plentiful. Fires have been frequent in the past, and the plant covering now is characteristic of the gum-land areas of North Auckland, *Leptospermum scoparium*, *Pomaderris phyllicaeifolia*, *P. Edgerleyi*, *P. elliptica*, *Leucopogon fasciculatus*, *Dracophyllum Lessonianum*, *Pteridium esculentum*, *Gleichenia circinata*, and stunted *Weinmannia sylvicola* being the predominant species.

All of the four species show best development where the soil conditions are good, but both *P. palustris* and *P. echinata* are progressing satisfactorily on less favourable sites.

### Rates of Growth.

*P. caribaea* and *P. taeda* are growing very rapidly, and at much the same rate; *P. echinata* comes next and *P. palustris* is the slowest of the four.

At the present time, 8 years after planting, the following are dimensions on a medium soil type:—

<i>P. caribaea</i> —	Maximum height	.. ..	22 feet
	Average height	.. ..	19 feet
<i>P. taeda</i> —	Average D.B.H.	.. ..	5 inches
	Maximum height	.. ..	25 feet
	Average height	.. ..	18 feet
<i>P. echinata</i> —	Average D.B.H.	.. ..	5½ inches
	Maximum height	.. ..	14 feet
	Average height	.. ..	11 feet
<i>P. palustris</i> —	Average D.B.H.	.. ..	3 inches
	(5 years after planting; sample trees from an area showing slightly better growth than the average.)		
	Maximum height	.. ..	7 feet
	Average height	.. ..	5 feet
	Average D.B.H.	.. ..	1½ inches

A "rogue" in the same area, considered to be *Pinus Sondereggeri*, was 9 feet in height.

On exposed sites with a westerly or southerly aspect, all species are scorched by the strong, saline winds.

*P. taeda* and *P. caribaea* are growing so rapidly that the soft shoots and branchlets frequently suffer from wind damage. Excessively long leading shoots, 7 feet to 8 feet long, with no side branches, similar to those seen in *P. radiata*, occur in the above two species.

*P. echinata* and *P. palustris* have harder and tougher needles and these species give an impression of hardness.

*P. caribaea*, *P. echinata*, and *P. taeda*, up to 8 years of age at least, when cut down, send up a vigorous growth of young shoots from the stools, and, judging from several 8 year old trees that have three or four leaders, 8 feet to 10 feet high, coming from ground level, it seems that these stool shoots are capable of developing.

*P. palustris* appears to be fire resistant when young. A fire which killed a *P. radiata* 20 feet high, also killed the leading shoot of a *P. palustris* 3 feet high. Subsequently the latter sent forth fresh shoots from ground level and is now as vigorous as ever.

*P. palustris* grows very slowly to begin with, and is rapidly covered over with a vigorous growth of bracken (*Pteridium esculentum*). It appears able to tolerate this shade in moderation, continues to develop, and with its long needles presses back the fern, thus forming an opening through which the leading shoot can develop.

Nursery Notes—*P. palustris*.

In the nursery 1 year old, unwrenched seedlings form suitable planting stock, the root system being a strong tap with short laterals. When lifting such unwrenched plants, if a trench from 12 to 18 inches deep is dug alongside the trees to be lifted, the roots can be cut well below the surface, and ideal planting stock results.

Early in the second year vigorous "rogues" frequently appear in the seedbeds, and, by the end of the year, are two or three times the size of the average. Some of these "rogues" can be identified as *P. taeda*. The others, more robust and vigorous, combine the rate of growth of *P. taeda* with the sturdiness of *P. palustris*. These apparently are a hybrid between the two, known as *P. Sondereggeri*.