

NEW ZEALAND



FOREST SERVICE

PUBLICITY ITEM No. 6

Reprinted from: N.Z. Journ. Agric. Vol. 91, No. 1, 1955

Trees on the Farm

Tree Growing on Sand Dunes

By W. H. JOLLIFFE, Officer-in-charge, Extension Forestry, New Zealand Forest Service

LONG stretches of the west coast of the North Island and other small areas of both islands are composed of sand. Some of it is under control by the careful use of grass or by a cover of marram grass and other sand-inhabiting plants, but much of it is more or less bare, even to the desert stage. This huge area, assessed not long ago at 290,000 acres, can be put to use, if not for pasture then for the growth of trees.

BEFORE trees can be planted in sand the sand must be stabilised by the growth of sand-loving plants so that the young trees will not be overwhelmed or exposed by subsequent wind blows. If the area borders the coast, the first work will be the building up of a protective barrier—the foredune—with brush fences parallel to high-water mark. When the first row becomes buried with sand another fence a little further back is erected and so on until the dune is 15ft. to 20ft. high.

The usual method of fixing the sand is by the planting of marram grass,

often in conjunction with the sowing of yellow lupin seed. The marram grass is planted at spacings of 2ft. x 2ft. to 4ft. x 4ft., depending on the degree of exposure to wind. The planting stock is dug from 2- or 3-year-old clumps, trimmed with a sharp spade to 10in. to 12in. long, and tied into convenient-sized bundles. Into each spade hole about three rooted pieces are inserted and well heeled in. Planting on dunes is done on contours and not in straight lines to avoid the formation of wind funnels, though this precaution is unnecessary on moist flats.

In exposed situations the planting of marram grass should be accompanied or followed by the sowing of seed of yellow lupin. This legume combines with the marram grass to form a very dense protective cover and at the same time it enriches the soil by the addition of nitrogen and humus.

Once planting of a sand area has begun all stock must be kept off it. Later, fire becomes the chief menace to reclamation work, especially as dunes have come to be regarded as public playgrounds. In addition to watchfulness against trespassing stock and the outbreak of fire it is necessary to inspect the area regularly for any blowouts after heavy winds. Gaps must be plugged with short lengths of permeable fence before they can develop into major rifts which can undo a lot of painstaking work. Until sand dunes are finally fixed with fairly durable forms of growth

Below—Marram grass planted in sand (and now in second year) is the first step in sand fixation before tree planting.



perpetual vigilance is required; the alternative is to leave unproductive many valuable acres.

TREE SPECIES FOR SAND COUNTRY

The Next Step

Two to 4 years after the planting of the marram grass the sand should be sufficiently stable to permit tree planting with safety. The amount of profitable tree growth depends on the degree of protection from strong, salt-laden winds afforded by the foredune. Along the west coast of the North Island there is always a belt of varying width where the trees are purely protective and not likely ever to have a timber value.

Where marram grass alone has been used to fix the sand, space for the trees can be cleared with a sharp spade, but where lupin occurs with marram grass planting lines have to be opened, either by cutting with a slasher or by crushing with a tracklaying tractor. In the latter method the tractor is driven forward and back over the area so that the near track on the back trip follows in the off-side track on the forward trip or vice versa.

The best planting tool in sand is a spade. Lines made with a tractor will be a little over 6ft. apart; if lines have to be hand cut, 8ft. or 9ft. apart saves a considerable amount of work and the plants can be put in at, respectively, 6ft. or 5ft. apart in the lines. Such spacings will, of course, entail thinning when the trees are 8 to 12 years old, depending on the species.

Suitable Species of Trees

There are not many species of trees which will tolerate salt-laden winds. The most tolerant of those ordinarily used in New Zealand is macrocarpa (*Cupressus macrocarpa*). Others which can be grown are radiata pine (*Pinus radiata*), Corsican pine (*P. laricio*), prickly coned pine (*P. muricata*), maritime pine (*P. pinaster*), and *Robinia pseudacacia*.

Protection

Trees growing on sand exhibit great resistance to wind blow. So deep do their roots go that they are more likely to lose their tops in a gale than to be uprooted. Another result of this deep-rooting habit is that they rarely suffer from drought.

Protection against fire is most effective if the sand is bounded by clean paddocks. This form of protection is more desirable on sand country than on other farm land, because it is much more difficult to maintain bare fire-breaks in sand. In fact where fire-breaks are necessary they must be clothed with some plant which will not carry fire and yet will stop the sand from blowing. Plants which are suitable include ice plant (*Mesembryanthemum*) and New Zealand spinach (*Tetragonia*).



Radiata pines planted in sand at Tangimoana, on the west coast of the North Island in Manawatu County. The tree being measured is 25 years old and 13in. in diameter.