

ADDISON SERIES.

Addison soils occur chiefly along the main road from Charleston to Waimangaroa and include the high terraces along the foot of the mountains. The general drainage is northward to the sea, and the topography flat to very gently rolling, giving rise to ridges and hollows of very faint relief. The soils have been formed from disintegrating granite gravels. At Sargeant's Hill, a common profile is:—

4 in. to 6 in. black peaty loam.
12 in. clay loam.
1 in. fine quartz gravel.
 $\frac{1}{2}$ in. to 1 in. iron pan.
On cemented granite, greywacke, and quartz gravels.

From the Buller Bridge to the junction of the Nelson and Greymouth roads the soils are usually up to 3 ft. in depth, but from the junction towards Greymouth the pan is usually less than 1 ft. from the surface, and there is no clay layer. In many places there is no soil at all, the fine quartz gravels coming right to the surface.

On all types in this series the depressions are wetter and have a more peaty top. The Addison soils are all badly drained, partly because a pan lies beneath, and partly because the topsoil absorbs and retains moisture. Yellow-pine logs and branches embedded in the soil indicate the type of vegetation once carried. The present cover is chiefly pakihi rush and umbrella fern. Umbrella fern thrives best on the wetter types, while pakihi rush is the chief species on the shallower, better-drained areas. Associated with these, and occurring mostly in the wet spots, are numerous low-growing mosses, and occasional poor stunted type of flax-bushes; but on the drier parts flycatchers, danthonia, and stunted, flattened manuka appear.

The high level terraces are similar to Virgin Flat except for the 700 acres, known as Caroline Terrace, where the profiles are more like those at Sargeant's Hill.

WILSON SERIES.

The soils are formed from northerly-trending, dry, sandstone ridges, lying between the sea-coast and the Addison soils, bordering the Westport-Greymouth Road. These sandstone ridges are nearly parallel to each other, and between each two lies a strip of wet flat land, largely built up by detritus washed down from the ridges. On the dry ridges themselves there are small, wet depressions giving a similar profile to that obtained on the flats. Almost everywhere there is an iron pan about $\frac{1}{4}$ in. thick, resting upon the sandstone.

On the ridges the soils range typically from 6 in. to 20 in. of moist sandy loam or sands on an iron pan. Many exposed small knolls of sandstone have no soil upon them, the pan and parent substance being at the surface. The original cover was chiefly rimu, kahikatea, beech, and totara, and the best was milled for timber, but some ridges carried no bush.

The commonest profile on the flats is 18 in. of sandy loam resting on sands, but in places there is a pan at 18 in. to 27 in. from the surface.

Pakihi fern is not as abundant as on the Addison soils, but there is more danthonia, pakihi rush, and gorse in dry places, and more sphagnum and other mosses in wet areas.

BULLER SERIES.

Along the banks of the Buller River and beside some of the larger streams there have been deposited in recent times gravels, sands, and silts, from which have been formed highly fertile silt loams and sandy loams of varying thicknesses, resting on gravels. These soils are well drained, except for about six square miles of swampy land in the Nine-mile Valley, south of Westport, where rushes and second growth have come in thickly, and some bush is left standing. This wet strip would yield good land, but drainage and clearing would be costly. Analyses of samples from this locality indicate slightly acid conditions.

TAURANGA SERIES.

In very recent times a thin strip of sandhills has been formed along most of the sea-coast. The higher dunes, back from the sea, have a dull-grey top about 10 in. in thickness, resting on pale-grey sand. The original cover was chiefly ribbonwood, wineberry, and fuchsia and cabbage-trees. These high dunes are well consolidated and fixed, a good pasture of mixed species growing well. The low dunes near the sea have only about $\frac{1}{2}$ in. to 1 in. of black topsoil on loose pale grey sands. Marram-grass and lupins form the chief cover of these loose dunes, but there are some grasses, clovers, and flatweeds.

To the east of Westport, along Utopia Road, the soils are formed from slightly older sands, and being exposed to the leaching action of rain for a longer time have lost some of their plant nutrients and in places a pan has been formed.

FOULWIND SERIES.

This series has been formed from limestone which occurs chiefly at Cape Foulwind. The usual profile is chocolate-brown clay loam or clay topsoil resting on a darker-brown clay subsoil. Small pieces of limestone occur throughout the profile and the parent substance comes to the surface in places. The crumb structure is excellent and very good garden and orchard crops were grown when the sawmills were working. Heavy bush containing a high percentage of rata once flourished, but little remains, most of the area now supporting a good mixed pasture.