

Ruatahuna Block, about thirty-four miles east of Rangitahi Block, contains 12,181 acres. Of this area somewhat less than 5,000 acres is in pasture, the remainder being in heavy bush. About 2,500 acres of the area in pasture, mainly in the valley-bottoms, is classed as flat and rolling. The remainder of Ruatahuna, including that covered with bush, is practically all steep country. The soil profile on Ruatahuna is—

- 7–9 in. grey to white coarse sands (Kaharoa).
- 6 in. brown, fairly compact sands (Taupo).
- 15 in. cream, loose pumice gravel.

This profile is found on all classes of country, so that only one soil type is needed for the subaerial deposits. Water-sorted beds, which consist chiefly of pumice with a small amount of greywacke, are not important, as they are less than 100 acres in area.

On Waerenga Block (north shore of Lake Rotorua) 1,097 acres are classed as rolling and flat country and 595 acres as steep. The soils are derived almost entirely from Kaharoa subaerial deposits, the texture of which is that of a gravelly sand. On the eastern corner Rotomahana coarse sands, 3 in. thick, overlie the Kaharoa ash, at one mile to the west they thin to 2 in., and on the western boundary are $\frac{1}{4}$ – $\frac{1}{2}$ in. thick. On steep slopes the Kaharoa gravelly sands have slumped and are mixed with the underlying Rotokawau sandy loam. Water-sorted beds, mainly resorted Rotomahana ash, cover about 100 acres.

Rangiuru and Maketu Blocks have a much better climate than Rotorua. Winter temperatures are higher, and consequently there is a much earlier growth of pasture. There are no data on climate for Rangitahi, but its climate is probably between that of Rotorua and Maketu. Ruatahuna has a high rainfall, more than 80 in., and snowfalls are common in winter.

As is to be expected, the moisture content of the sandy soils of this group is in general low during dry weather. The pasture on Kaharoa medium sands at Rangitahi suffers badly owing to the presence of the loose gravelly sands 5 in. below the surface. The coarse sands, stony sands, and gravels on Rangitahi dry out even more than the Kaharoa medium sands. At Ruatahuna the high rainfall keeps the soil moist during summer.

The “available” iron in the soils of Rangitahi and Waerenga is considerably lower and on Rangiuru and Maketu a little higher than in the Taupo pumice. Bush sickness is to be expected on all these blocks if the stock are confined to the Kaharoa soils, though on the Maketu and Rangiuru Blocks the trouble may be confined to sheep. But there are large areas of healthy water-sorted beds on Maketu, Rangiuru, and Rangitahi, and if each farmer gets a portion of them in his section or, if this is not possible, as is the case on Maketu, has the use of a section of healthy land reserved for common grazing, he can keep his stock healthy. The thin coating of Rotomahana ash on Waerenga will have a beneficial effect as far as bush sickness is concerned, for on areas where this ash is thick anæmia in stock does not develop. Judged by the experience of a settler in the district there will be a slight amount of sickness in sheep where the ash is less than 3 in. thick. Maori farmers state that sheep grazing on Ruatahuna do not go sick; this year the Department of Native Affairs took off fat lambs in April.

Group (3).—The areas to be developed on which grey Rotomahana ash forms the soil contain in general a high proportion of steep land. On Taheke nearly two-thirds of the land not covered with bush is classed as steep, on Tikitere one-sixth, on Puketawhero slightly more than half, and on Wharenui almost three-fifths.

The climate on these blocks is similar to that of Rotorua.

Rotomahana ash, deposited during the Tarawera eruption of 1886, is a mixture of fragments of rhyolite and of basalt. It is thickest on Wharenui and Puketawhero, where it ranges from 6 in. to 9 in.; on Tikitere it is between 3 in. and $5\frac{1}{2}$ in.; on Taheke the 4 in. on the southern boundary thins to 2 in. on the northern boundary. The texture of the soil is that of a sandy loam on Puketawhero and Wharenui, and a coarse sand on Tikitere and Taheke. On most of the steep slopes the grey ash is thin or absent, having been washed into the valley-bottoms, where it forms water-sorted beds of relatively small area. Underlying the grey ash are the gravelly sands and sands of the Kaharoa shower. The Kaharoa ash is the most important soil-forming bed on the steep-slopes at the northern end of Taheke.

The Rotomahana sands contain a low percentage of moisture during dry weather. The sandy loam holds the moisture fairly well.

The grey ash contains more “available” iron than the Taupo pumice, and bush sickness is unknown on soils derived entirely from it. Over much of Taheke the Rotomahana ash is between 2 in. and 3 in. thick, and since the Kaharoa ash underlies, a slight amount of sickness in sheep is to be expected.

GALATEA ESTATE.

Galatea Estate, which lies 30 miles south-east of Rotorua, is eight miles long by four miles and a half wide, and has an area of 21,694 acres, of which 21,000 acres is easy to flat country. It occupies the greater part of a flattish basin, 600 ft. to 700 ft. above sea-level, lying between the Kaingaroa Plains to the west (1,800 ft.) and the Tawhinau Range to the east, which rises abruptly to 3,300 ft.

Streams draining the Tawhinau Range have built up a series of gravelly fans, which give the estate a gentle west-north-west slope. Much of the water of these streams soaks into the gravels of the fans and appears farther west as springs. Swamps occupy slight depressions between the individual fans, the largest, which is known as “No Man’s Land,” being 400 acres in extent.

The Rangitaiki River, which bounds the estate on the east and the Whirinaki on the south, are entrenched about 50 ft. and are bordered by a belt of low terraces. The northern two-thirds of the estate is well watered; the remainder is poorly watered, but large supplies of good water are close at hand.

At two points the Whirinaki and Rangitaiki rivers show signs of changing their courses, and if this is not prevented 240 acres of river-flat may be lost to the estate.