

The Great Frost of 6 October 2022

Paul Cashmore

Frosts are not unusual in the Central North Island, even well into spring. However last season on 6 Oct 2022, the Central North Island had a relatively hard and widespread frost quite late in the season, which MetService recorded as a minus 3.5 degree frost at Rotorua airport weather station. This would normally be considered a hard frost for Rotorua even in winter, let alone well into spring.

By the end of October, reports that I received, and my own observations, showed the impacts of that frost starting to manifest on some of the indigenous species around the Central North Island.

The most obvious was 'brown off' of tawa (*Beilschmiedia tawa*) on the canopy of mature trees, which was noted in and around Pureora, Whirinaki (see Figure 1) and, to a lesser extent, on SH5 on Mamaku Plateau near Galaxy Road. I recall a similar widespread tawa canopy 'brown off' that I observed back in the early 2000s in and around Whirinaki and Ruatahuna, which was believed to be due to a particularly hard spring frost. I remember that the brown off remained highly visible across the tawa-dominated canopy for the entire year afterwards until it gradually disappeared with new growth in the following spring. Therefore, this is clearly an event which happens infrequently, maybe once every decade or two on average.

I also observed significant dieback of tree fuchsia (kotukutuku) (*Fuchsia excorticata*) along SH 30 through Pureora (Herekawe Scenic Reserve), a route I travel often, and also in Blue Lake Holiday Park at Lake Tikitapu. It appears that the frost killed the newly developing leaves and buds on the deciduous tree fuchsia in less sheltered areas. While not all trees were impacted, as Figure 2 and 3 show, a significant number of trees in more exposed sites, including the forest edge along the highway, were totally or almost totally defoliated. Upon closer investigation you could see the young emergent leaves completely browned off on each affected tree (Figure 3). I have continued to monitor these trees for the remainder of the 2022/2023 season and currently, as at May 2023, most remain partially or completely defoliated and have not recovered, looking as you would expect to see them in the middle of winter. The trees are not dead, as a quick check under the bark shows the branches are still green and some trees have a few or local patches of leaves often on lower more sheltered branches.



Figure 1: Tawa dieback in the Okahu Valley, Whirinaki, October 2022 (DOC Murupara)

These are two indigenous species that I have personally observed, that seem to be very susceptible to harder spring frosts across wide areas of the Central North island. Undoubtedly there will be other species. Many gardeners have also noted the negative impact of the same frost on flowering and leaf development and ultimately fruit production of their fruit crops this year.

It will be interesting to watch the impact of a whole season of individual tree fuchsia defoliation on flowering and then subsequently leaf development this coming spring.



Figure 2: Tree fuchsia dieback, SH 30, Herekawe Scenic Reserve, 19 November 2022



Figure 3: Close up of tree fuchsia dieback, SH 30, Herekawe Scenic Reserve, 19 November 2022 showing dead leaves on branches.