

FROST DAMAGE TO NATIVE PLANTS 1982

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The winter of 1982 produced the heaviest frosts experienced over much of the North Island for many years. The sight of plants devastated by harsh frost indicates the role that frost can play in determining plant distribution. Nevertheless the interplay between frost and plant species is complex. Some plants are very frost sensitive, and their cells are killed by even a light frost, whereas others can tolerate many degrees of frost. Such differences between species are a result of their differing genetic makeup. But environment also plays a role and previous exposure to cold will "harden" a plant enabling it to tolerate more intense frosts than it could otherwise have.

Of course the intensity of frost on an area depends a lot on topography - valley bottoms get intense frosts, ridges and higher slopes are less affected. Features such as overhanging rocks, or since man's debut walls and buildings, can protect plants from the extremes. Frosts are more intense nearer the ground and thus trees may escape the effects of severe frosts whereas nearby saplings of the same species may be killed.

The effect of topography was well illustrated at the Waitaramoa Reserve, Auckland, which lies in the valley by Portland Road along the foot of a steep ridge with Victoria Avenue along the top parallel to it. During the 1982 frosts mangrove (Avicennia resinifera) and pohutukawa (Metrosideros spp.) were noticeably affected and much young leaf growth killed in the Waitaramoa Reserve whereas pohutukawa and many frost sensitive exotics in Victoria Avenue were quite unaffected.

The following list collects together some miscellaneous observations made during the winter.

L. Barrier = Little Barrier and R.O. = Royal Oak, Auckland City.

- * Slight damage, often only a few leaves affected, usually at the tips.
- ** Extensive damage; many leaves both young and old browned. In some instances the plant may have been killed.

Ferns

- ** Cyathea medullaris, Waikato; Rotorua; Taranaki; Auckland.
- * Dicksonia squarrosa, Cult. R.O. ex Waitakere Ranges; Taranaki, but nearby D. fibrosa not affected.
- * Blechnum capense, Taranaki.
- ** Marattia salicina, Cult. Epsom, Auckland. Blanche Wormald reports that fronds unprotected by overhanging trees were extensively damaged.
- * Paesia scaberula, Taranaki.
- ** Pteris tremula, R.O., weed.

Monocotyledons

- ** Arthropodium cirratum, Cult.R.O.
- * CollospERMUM hastatum, Taranaki, exposed plants in damaged forest.
- * Freycinetia banksii, Taranaki.
- * Rhopalostylis sapida, Cult.R.O. ex L. Barrier and Waitakere Ranges; Taranaki.

Dicotyledons

- ** Avicennia resinifera, Hobson Bay, Auckland, although only in some parts of the Bay.
- ** Beilschmiedia tawa, Waitomo; inland Taranaki. Leaves often extensively burned even on tall canopy trees.
- ** Brachyglottis repanda, Waitomo.
- * Coprosma repens (variegated form), cult.R.O., leaves brown mainly in the white regions.
- ** Elatostema rugosum, Waitomo, growing in shade but nevertheless extensively frosted.
- ** Entelea arborescens, Cult.R.O. ex L. Barrier.
- * Geniostoma ligustrifolium, Cult.R.O. ex L. Barrier.
- ** Heimerliodendron brunonianum, Cult R.O. ex L. Barrier.
- ** Hibiscus diversifolius, Cult. R.O.
- ** Macropiper excelsum, Waitomo, affected in exposed spot but not nearby under a sheltered overhang; Cult. Royal Oak ex Bank's Peninsula, East Cape, Muriwai, North Cape, Mayor Is., Poor Knights, Kermadecs.
- * Metrosideros carminea, Cult.R.O.

- * Metrosideros excelsa, M. kermadecensis, R.O., wild seedling badly damaged, lower leaves of a cult. 3 m tall tree slightly damaged; Portland Road, Auckland, row of street verge trees of mixed M. excelsa, M. kermadecensis and putative hybrids were all damaged on upper and outer leaves.
- ** Meryta sinclairii, R.O. cult.; Sandringham cult; Auckland Zoo cult. The first two records are for small plants 2-3 m tall whereas at the Zoo large specimens, 6-9 m tall, showed browning on exposed leaves.
- * Myrsine australis, Cult. R.O. ex L. Barrier.
- * Rhabdothamnus solandri, Cult. R.O. ex L. Barrier

The following species cultivated at Royal Oak were not damaged although the nearby plants mentioned above were.

Astelia banksii, Astelia ?grandis, Coprosma 'kirkii', Cordyline ?kaspar, Dianella nigra (enhanced bronzing), Fuchsia procumbens, Griselinia littoralis, Hoheria populnea, Leptospermum scoparium, Podocarpus nivalis (enhanced bronzing of leaves) Pomaderris oraria var n.3., Pittosporum crassifolium, Sophora tetraptera.