

Case study: University of Auckland, School of Engineering greenroof plants

- *Acaena microphylla* - bidibid
- *Coprosma acerosa* 'Hawera' - a prostrate variety of sand dune coprosma
- *Cotula australis*
- *Crassula sieberiana* - succulent sourced from scoria rock walls
- *Disphyma australe* - New Zealand iceplant
- *Festuca coxii* - a type of tussock grass
- *Libertia peregrinans* - New Zealand iris
- *Mazus pumilo*
- *Pyrrosia eleagnifolia* - sourced from scoria rock walls, planted in the second winter
- *Selliera radicans*

The greenroof was constructed in late spring 2006. After one year *Disphyma australe* and *Crassula sieberiana* have established large numbers of new seedlings across most of the roof, including areas where they were not originally planted. *Crassula* may not provide year-round cover. We wait to see if the new iceplant seedlings will survive summer. Vegetation data quantifying performance after the first year has yet to be analysed, however, species that have highest survival are iceplant, crassula, fescue, sand-dune coprosma and NZ iris. Some individuals of all plant species survive on the roof - no species has failed entirely, however, survival appears to be highest on areas with more shade and deeper substrate (plots are either 50 or 75 mm depth).



Fig. 1 Native plant section of Plot one, spring 2007, about one year after establishment, showing *Crassula sieberiana* (right and background) with iceplant (light green succulent in foreground), NZ iris (orange spikey foliage on left) and fescue (blue tussock grass in the centre). Two sedum species have invaded the plot (bright yellow *Sedum mexicanum* upper left and a cultivar of *Sedum album* - the blue succulent within iceplant in centre foreground and left)

Case study: Waitakere Civic Centre Greenroof plants

About 50% of the plants were the following three species, (* = sourced from the Waitakere Ecological District source):

- *Disphyma australe** - New Zealand iceplant
- *Coprosma acerosa** - sand dune coprosma (prostrate and upright forms)
- *Libertia peregrinans* - New Zealand iris

Smaller proportion:

- *Calystegia soldanella** - sand dune convolvulus
- *Dichondra repens** - Mercury Bay weed
- *Selliera radicans**
- *Leptostigma setulosa*
- *Acaena microphylla* - bidibid (green form)
- *Pimelea prostrata* - New Zealand daphne
- *Festuca coxii*
- *Muelenbeckia axillaris* and *M. complexa* (in an area with substrate to 200 mm depth)

The greenroof was constructed in winter 2006. After one year *Disphyma australe* has established large numbers of new seedlings. Vegetation data quantifying performance after the first year has yet to be analysed, however, species that have highest survival are iceplant, fescue, sand-dune coprosma and NZ iris. Some individuals of all plant species survive on the roof, however, the diversity and cover of plants is highest on areas with deeper substrate (100 to 150 mm depth); two areas with thin substrates (c.70 mm depth) have had moderate to high plant mortality. Mercury bay weed, Selliera and Leptostigma died back in summer but have spread dramatically since autumn rains have fallen - these species may be best suited to deeper substrates or areas with afternoon shade.



Fig. 2 Waitakere greenroof in spring 2007, just over one year after establishment. A 1 to 2 m wide strip of deeper substrate along the left hand side is planted in *Muehlenbeckia* species, white-flowering NZ daphne (*Pimelea prostrata*) and rounded mounds of *Leptostigma setulosa*. The remainder of the roof is visually dominated by the tall spikey fescues (blue tussocks, *Festuca coxii*) and NZ iris (orange, *Libertia peregrinans*), and lime-green iceplant.