

ESTABLISHMENT RATE OF 12 ORNAMENTAL GROUND COVER SPECIES FOR WEED CONTROL



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Introduction:

- Less herbicide is required in urban areas if weeds are suppressed using ground covers.
- However, information is lacking on the relative performance of species used as ornamental ground covers.
- One aspect of interest is how rapidly ground cover species can establish, and thus become capable of smothering weeds soon after planting.
- This study measures the rate of establishment of 12 ground cover species selected for differences in growth forms and habits.

Materials & Methods:

- Plants of 12 perennial ground cover species (Fig 1, right) were established from transplants into plots of bare soil in November 2008 at Massey University, Palmerston North.
- Three plots (each 2m x 2m) of each species were established in a randomised block design, with each plot containing three plants in an equidistant triangle pattern 1.0m apart from each other (Fig 2, below).
- The soil type was a Manawatu fine sandy loam. All plots had ammonium sulphate applied (200 kg/ha N) then sawdust was laid to 7 cm deep.
- Measurements made over subsequent months included plant diameter, height and estimate of percentage coverage of soil by each plant.

Results & Discussion:

- After 20 weeks, *Polygonum capitatum* had established the most rapidly (Table 1 below), completely covering the plots in dense growth and seeding prolifically, but then it suffered a sudden die-back, apparently from sensitivity to frost. None of the other species were badly affected by frost.
- *Ajuga reptans* produced the tallest plants after 20 weeks, and also produced the best foliage density due to its large leaf size and tight rosette arrangement.
- *Sedum mexicanum* had the greatest increase in relative size over the 20 weeks, but it was the smallest at planting which may have skewed this parameter. It produced good foliage density because of dense interlocking of its succulent leaves. However, it was the most prone to rabbit damage with nearly half of the plants being repeatedly damaged.
- Two other species exhibiting rapid establishment ability over the first 20 weeks were *Grevillea lanigera* and *Acaena inermis*, both producing plants over 80 cm in diameter.
- *Juniperus procumbens*, the most woody of the 12 species, was also the slowest to establish, though its woody nature may make it a more permanent ground cover once established than many of the herbaceous ground covers.
- Although measurements presented here were from 20 weeks after establishment, the plants continued to expand after this time. The ground covers are being monitored for the next 1-2 years to determine their long-term ability to out-compete weeds. Results obtained will facilitate selection of the most useful ground cover species for urban weed control.

Table 1: The mean diameter, height, and foliage density (percentage of soil covered) for 12 ground cover species 20 weeks after planting. The initial diameter of plants at transplanting and percentage increase of plant diameter are also shown.

Species	20 week diameter (cm)	Initial diameter (cm)	Diameter increase (%)	Height (cm)	Foliage density (%)
<i>Polygonum</i>	158	26	513	5.0	88
<i>Ajuga</i>	89	33	174	23.2	100
<i>Grevillea</i>	86	31	176	16.0	83
<i>Acaena</i>	81	17	391	9.8	90
<i>Pimelea</i>	65	22	188	7.9	85
<i>Veronica</i>	63	25	154	9.1	90
<i>Coprosma</i>	62	34	84	9.9	77
<i>Juniperus</i>	59	43	41	10.6	47
<i>Muehlenbeckia</i>	56	15	279	8.3	90
<i>Sedum</i>	53	8	614	8.4	79
<i>Lithospermum</i>	50	23	126	10.5	70
<i>Ophiopogon</i>	41	26	60	10.2	67
LSD _{0.05}	14.8	6.0	144	2.8	19



Figure 2: An overview of some of the plots, shown three days after planting.

Acknowledgements:

We wish to gratefully acknowledge the financial support received from Massey University, the Dan Watkins Scholarship in Weed Science and the Sir Victor Davies Foundation, and also the assistance from field technicians Mark Osborne and Peter Jessop.

Figure 1: The 12 ground cover species assessed for rate of establishment after transplanting.



Acaena inermis 'Purpurea' (Rosaceae)



Ajuga reptans 'Caitlin's Giant' (Lamiaceae)



Coprosma acerosa 'Taiko' (Rubiaceae)



Grevillea lanigera 'Little Drummer Boy' (Proteaceae)



Juniperus procumbens 'Nana' (Cupressaceae)



Veronica peduncularis 'Oxford Blue' (Scrophulariaceae)



Muehlenbeckia axillaris (Polygonaceae)



Lithodora diffusum 'Grace Ward' (Boraginaceae)



Ophiopogon planiscapus (Ruscaceae)



Pimelea prostrata 'Anatoki' (Thymelaeaceae)



Polygonum capitatum (Polygonaceae)



Sedum mexicanum 'Acapulco Gold' (Crassulaceae)



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