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Rooting of Karoo shrub cuttings

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Introduction The Nama Karoo biome of South Africa is dominated by Karoo shrubs (bushes), which are mainly utilized by extensive sheep farming. Seed of Karoo shrubs is not readily available and information on its germination is limited. Rooting of plant material can be used for mass production of plant species that usually have poor seed germination or for the production of clones of selected individual plants of the same species. Therefore, a pilot trial was conducted to test the ability of vegetative propagation, through stem cuttings, of some Karoo shrub species. Production of these species might be useful for reclamation purposes (Burke, 2005).

Material and methods Plant material were collected during autumn at Grootfontein Agricultural Development Institute in the False Upper Karoo (South Africa) and included the following species: *Tripteris sinuata*, *Salsola calluna*, *Limeum aethiopicum*, *Nenax microphylla*, *Plinthus karooicus*, *Hermannia cuneifolia var glabrescens*, *Phymaspemum parvifolium*, *Pentzia incana*, *Eriocephalus ericoides* and *Walafriida saxatilis*. Three replicates of 15 cuttings per treatment were used. Stem cuttings were treated with three hormonal regimes: 0 g/kg (T1), 1 g/kg (T2) and 3 g/kg (T3) IBA [4-(indol-3-yl)-butyric acid]. Treated cuttings were placed in two growth media (filter sand and hygromed seedling mix) in a mistbed for six weeks. After six weeks the cuttings were removed from the growth media. Those with one or more roots longer than 10mm were counted as rooted cuttings.

Results No significant differences ($P < 0.01$) were found between the growth media. On average, T3 showed the highest rooting at 27%, while T1 were the lowest at 20% (Table 1). The rooting of T2 was intermediate.

Table 1 Percentage rooting of each Karoo shrub species for the different treatments.

Species	Rooting (%)			Mean rooting per species (%)
	IBA [4-(indol-3-yl)-butyric acid]			
	0 g/kg (T1)	1 g/kg (T2)	3 g/kg (T3)	
<i>Limeum aethiopicum</i>	0	0	0	0
<i>Salsola calluna</i>	0	0	0	0
<i>Phymaspemum parvifolium</i>	10	7	23	13
<i>Eriocephalus ericoides</i>	4	14	24	14
<i>Walafriida saxatilis</i>	10	10	23	14
<i>Tripteris sinuata</i>	16	22	3	16
<i>Plinthus karooicus</i>	10	20	20	17
<i>Hermannia cuneifolia var glabrescens</i>	5	20	30	18
<i>Pentzia incana</i>	72	76	66	71
<i>Nenax microphylla</i>	72	77	79	76
Mean rooting per treatment	20	25	27	24

The rooting percentage of *N. microphylla* (76%) and *P. incana* (71%), were significantly ($P < 0.01$) higher than that of the other species, while *L. aethiopicum* and *S. calluna* showed no rooting at all. Rooting of the other six species was very poor and varied from 13% for *P. parvifolium* to 18% for *H. cuneifolia var glabrescens*.

Conclusions Rooting of *N. microphylla* and *P. incana*, species with a prostrate growth form, was satisfactory and might be increased with further refinement of the rooting procedure. *Limeum aethiopicum* and *S. calluna*, species with an upright growth form, were at a seed set stage during collection of plant material, which might explain the no rooting at all. As this trial was conducted during the autumn, it is recommended to be repeated during the other seasons, while the Karoo shrubs are in different phenological stages, which might show different results. If rooting is still not increased, other species could be tested. Other concentrations of IBA might also be investigated, as well as different portions of stem used for cuttings and age of stems used (Malan & Rethman, 2001).

References

- Burke, A., (2005). Best practice guidelines for minimising impacts on the flora of the Southern Namib. *EnviroScience and Namibia Nature Foundation*, Windhoek, 52pp.
- Malan, P.J. & Rethman, N.F.G., (2001). Use of stem cuttings to propagate *Atriplex nummularia* (oldman saltbush) vegetatively. *Grootfontein Agric*, 3 (1), 4-6.