

Effect Of Container Shape on Top Growth and Root Development of Selected Landscape Trees

A study by Hani A. Alzalzeleh

(Superroots Air-Pot formerly known as SpringRing.)

This research study looks at the effect of container type on root development to consider the longer term impact on tree survival potential. The objective is to aid in producing trees without deformed roots that have the potential to grow deep and free of deformity. The study covers: literature review; container grown trees; impact of container type; impact of container media; impact of root loss.

The experimental study investigates the effect of container form on tree root development and subsequent establishment. Data presented concentrate on the findings of one completed study testing the influence of different container shape on top vigour and root growth of *Acacia Saligna* and *Eucalyptus Viminalis*. The experiments were implemented in the Plant Science glass house. Plant top growth and root growth was manipulated by the use of three container types:

1. Conventional Nursery pots - denoted by **C**
2. Root Trainer - denoted by **T**
3. SpringRings (Superroots Air-Pot) - denoted by **S**

The data obtained in this report shows significant differences.

- Treatment S produced the highest plant growth, with the greatest performance recorded for *A.Saligna*.
- For leaf area, C and S were found to be better than T for *A.Saligna*, but there were no differences in *E.Viminalis*.
- Shoot weight was lowest for T but the opposite effect was found for *E.Viminalis*.
- Shoot weight was high in C and S as well as total top weight.
- Root length responded differently to all treatments.

The result also revealed that C significantly affected *A.Saligna* root weight and T gives better height value for *E.Viminalis*. In addition, root weight of *A.Saligna* relevantly affected total plant weight. This is not the same for *E.Viminalis*, no differences were found within the treatments.

Observations showed that roots of *A.Saligna* in SpringRing look denser, but roots of *E.Viminalis* in a Root Trainer appeared denser.

SpringRings encouraged the roots to grow outward in all directions towards the containers wall edge. Root Trainers and the conventional nursery pots forced the roots into certain paths. *The conclusion indicated that in order to have healthy nursery plant stock, it is very important to consider container shape.*

Further investigation is proposed to increase the awareness of root architecture and enhancing container plant growth.

Conclusion: Superficial evaluation suggests that SpringRings had better results on *A.Saligna* top growth whereas conventional pots give the highest in root weight and as a consequence produced greater total plant biomass.

Clear trends were less obvious for Eucalyptus, but tended to contrast with the findings of Acacia. However, it would be unjust to make any generalization until more data are available for different plant species.

An important issue that is to be addressed is "What is quality?". Nurseries may prefer to see greater height increment, but it may be that survival in the landscape is favoured by shorter stem growth and

higher investment in roots. On the other hand increasing root biomass is counter productive if the root produced is inefficient, has low regeneration potential or has faults such as girdling that in the long term will undermine tree performance.

It is important therefore to follow this experiment with longer term trials looking at how the plants grown under these three treatments will perform once transplanted. Another important variable is the timing at which the harvest was made. The longer the trees remained in the containers the more likely this treatment would become pot bound and the more a growth decline would be expected.

It may therefore be that one effect of the SpringRings or Root Trainers may be to prolong the shelf-life of the stock and to increase nursery flexibility.

The results of this study confirm the importance of new investigation in considering container form and seedling production. This could have a remarkable effect on the production methods for future trees.

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