

other planting techniques, follow-up weed control is essential to ensure that the seedlings become trees.

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NON-ASTRINGENT PERSIMMON PROPAGATION IN SOUTHEAST QUEENSLAND

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INTRODUCTION

The persimmon (*Diospyros kaki*) is native to China and Japan. Most of the development of the crop has been done in Japan where the persimmon has been considered as its national fruit. In 1987, domestic production of the persimmon in Japan was 309,000 tonnes; the fruit is consumed both as a fresh fruit and a processed product. Persimmon industries are now being developed in Australia, New Zealand, California, Israel, and Italy.

Evaluation of the persimmon in southeast Queensland has primarily been aimed at making better use of frost-prone, marginal, horticultural land unsuited to most other tree crops. There is the potential for exporting "out-of-season fruit" to Japan, other Asian countries, and Europe as the fruit is much sought after in these countries.

At this stage there are approximately 15,000 trees planted in southeast Queensland and market prices in Brisbane for 1987 have been firm. The use of top quality, uniform planting material is critical in the establishment of any orchard. In southeast Queensland there have been variations in the success of persimmon propagation techniques.

PROPAGATION TECHNIQUES

Rootstock Selection. There are three rootstock species commonly used for persimmons in the world.

1. *Diospyros kaki*—Japanese/oriental persimmon;
2. *Diospyros lotus*—date plum (native to China);
3. *Diospyros virginiana*—American persimmon (native to midwest and southeast United States).

Of the three rootstock species used, *D. kaki* is the most preferred in southeast Queensland due to its compatibility with all cultivars. In southeast Queensland, there are more than twelve local selections of *D. kaki* which show adaptation to their local area. There have been sporadic incompatibility problems with some nonstringent persimmon cultivars, such as 'Fuyu', grafted onto date plum (*D. lotus*). This has not been evident in all cases and it seems to be related to different strains of both rootstocks and cultivars.

There is one method of determining the identification of a particular rootstock species (1). A sample of bark or portion of an old root found well below the soil surface is placed in a test tube with 15 times its weight of distilled water. The test tube is left to stand for one or two hours. At this stage a slight colour change will occur denoting a difference among species, namely: *Diospyros kaki*—amber; *Diospyros lotus*—yellow; *Diospyros virginiana*—light yellow to colourless.

By decanting off the liquid and adding a few drops of a weak sodium hydroxide solution, the colour change becomes more pronounced, i.e.: *Diospyros kaki*—wine red; *Diospyros lotus*—light amber; *Diospyros virginiana*—light yellow to colourless (1).

The identification of a rootstock species can be accurately determined using this method.

Seed Collection and Germination. Seed should be collected from mature but not decomposed fruit, as seed from decomposed fruit has a low to nil germination rate. Generally persimmon seed should be stratified at 10°C for 60 to 90 days (2) although upwards of 80% success has occurred if seeds are sown immediately after extraction from the fruit. Seedling variation in both vigour and uniformity can be large especially with local selections. The source of seed becomes a very important consideration for uniform rootstocks. Seed is generally collected from a known local selection or imported from Japan.

Budding and Grafting. Persimmon scion cultivars can be propagated by either budding or grafting. Grafting is more successful than budding but should be done before the commencement of sap movement which occurs in late August/early September (late winter to early spring). Whip or cleft grafting is the most successful with a greater than 95% success rate. High humidity (70 to 80%) favours a good take and this can be achieved by placing plastic bags over the entire scion and graft union after taping. Callus forms very rapidly under warm conditions (22 to 25°C) and the bag also protects the soft new shoots from the drying effect of the wind. After 14 to 20 days the plastic bag is untied but not removed until 36 to 48 days. Once removed the plants are grown on and hardened off for planting.

Budding can be done in the early autumn period (late

February/early March). Chip budding has been more successful than T-budding (70% and 50%, respectively). Even with a lower success rate from budding in early autumn, there is the added advantage of producing enough growth for planting out in winter.

Cutting propagation. There has been no work carried out in southeast Queensland on the use of cuttings or tissue culture in the propagation of persimmons. A major benefit which could come from these methods would be in the production of uniform rootstock material.

The potential of these methods in reducing variability among plants is still to be realised in southeast Queensland.

CONCLUSIONS

The persimmon industry in Queensland is still at a very early stage in its development and aspects of orchard production are still being evaluated.

High density orchard plantings, specifically for earlier and higher yields, require a less vigorous tree capable of performing well in all situations. This could be achieved through the use of low vigour or dwarfing rootstocks, clonally propagated to ensure uniformity.

The selection of rootstocks may rely on a local selection with good adaptation to local conditions (drought tolerance, salt, waterlogging, climate).

As the persimmon industry in southeast Queensland starts to develop further, the direction for future propagation needs will be more adequately assessed.

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