

## The Multiplication and Distribution of Improved Clonal Selections of Fruiting Plants

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### INTRODUCTION

To confine my view to the last 25 years I unhesitatingly nominate the multiplication and distribution of selected clones of fruiting plants as the most important development that has assisted our business. As supporters of schemes dedicated to improving quality and performance of fruit-bearing plants we are a vital link between plant breeders, research workers, and the Australian fruit industries.

Our nursery is located in the Sunraysia district, which is at the heart of the Murray/Darling river basin. We aim to service the needs of fruit growers in this basin. This river system supports Australia's two largest, fully irrigated fruit production industries, grapes (*Vitis*) and citrus. These two industries contribute significantly to our gross national product. It is fundamental to the sustainable success of these industries that we grow the most improved clones with the best possible health status.

The first 10 years of my working life were with the Commonwealth Scientific Industrial Research Organisation (CSIRO). During this time I was involved with their grapevine clonal selection program. This made me very aware of the genetic imprisonment a grower locked himself into when establishing a fruit producing plantation — which may be the source of his income for the whole of his working life, or at least until he decides to refurbish his original plantation — and the significance of this to the industry as a whole. There are many instances of a 25% to 35% yield increase from one clone to another in any one fruit variety.

When I left CSIRO in 1962 to further develop our small nursery I found, to my dismay, the only source of recommended propagules (bud wood, cuttings, and seed) was from vineyards and orchards considered "good performers". Obviously an individual plants' success was related to productive soil types and good farming practices and had nothing whatsoever to do with improved genetic performance and health status.

### INDUSTRY FRUIT IMPROVEMENT ASSOCIATIONS

Over the last 50 years Australian citrus production has increased by 50% per hectare mainly due to improved health status of high yielding clonal selections. Citrus industry involvement in the multiplication and distribution of selected propagules began in New South Wales in 1948. Of recent years that scheme has become part of the Australian Citrus Improvement Association and now serves as the Australian Citrus Propagation Association.

With these facts so apparent I have devoted the past 25 years to serving as a director on a number of fruit-improvement association boards. The Victorian and Murray Valley Vine Improvement Association (VAMVVIA) was established in 1986 to handle the gathering and distribution of cuttings from clonal selections of grape varieties to grape growers and nurseries. The Association is a nonprofit organisation

directed by representatives of various grapevine industry groups — dried fruit, table grape, and wine grape industries and their respective scientific support and advisory groups. Similar regional associations now exist throughout Australia. They are brought together under a national organisation titled the Australian Vine Improvement Association (AVIA). Its role is to import new and improved clones of grapevines and to hand the multiplication and distribution organisation over to the regional associations. It also supervises a national accreditation scheme which will ensure all players adhere to standard protocols.

All of these associations bring together industry and research people with the common goal of varietal improvement via selection, plant breeding, and plant health. This role model has now been adopted by most fruit industries such as citrus, stone, pome, nut fruits, etc.

The Australian Olive Industry Association (AOIA) is currently developing a similar organisation. Repositories of DNA-fingerprinted varieties are being established as the initial “mother plants” from which propagules will be distributed. Even the infant Australian Quandong Industry Association (AQIA) is part way down the same road.

## **HEALTH STATUS OF MOTHER PLANTS**

Giant steps forward are being achieved in the science of virus assay and elimination. Also inoculation to ward off severe strains, together with elimination of viroids, phytoplasmas, and bacterial organisms. The Nurseryman’s attention to plant hygiene plays a vital role in ensuring clean stock is being planted by our Australian fruit industries.

The role of the fruit industry improvement associations is to multiply the improved selections by establishing registered mother plantings which are monitored for “trueness to type” and health status. This is achieved in cooperation with our research organisations which provide the services of plant virologists, bio-physicists, entomologists, and the like. Monitoring is ongoing and usually mother plantings are visited twice annually by professional staff. The distribution of propagules — cuttings, bud wood, and seeds — requires the organisation of collection, grading, packaging, and shipment of propagules to nurseries all over Australia.

In the case of the AVIA the national repository of varieties, the gene bank, is planted on state owned land. Whereas the registered multiplication plantings are on both private and state-owned land. In the case of the Australian Citrus Propagation Association both the national repository and multiplication plantings are on state owned land.

Today we have the emergence of companies like the Australian Nursery Fruit Improvement Company (ANFIC) which not only concerns itself with the introduction of new and improved varieties of fruiting plants to Australia, but also brings together the plant breeder, propagule multiplication, the nurseryman, the fruit grower, and the fruit marketing chain.

## **CONCLUSION**

Today’s fruit growers are very aware of the genetic improvements of the clonal selections they grow, both in rootstocks and scions. They are also prepared, via a levy on fruit sold, to fund schemes which improve, monitor and maintain superior health

status of the mother plants from which their plants are propagated.

In the world of fruit production each commodity industry is at the forefront of plant selection and improvement. Growers are constantly refurbishing orchards and vineyards in response to market-driven demands.

I believe similar schemes could improve the planting material standards in ornamental horticulture. To the best of my knowledge we do not have an establishment similar to the English RHS Wisley Gardens in Australia.

As a consequence of my wife, Lois, and my deep involvement in the establishment of the Australian Inland Botanic Gardens, in the Sunraysia district, I propose to the Australian nursery industry that a sophisticated propagule multiplication and distribution organisation be established in concert with our Australian Botanic Gardens and/or our universities. We, the propagators, can make this happen.

Finally, I must comment that I have the greatest respect for the professional dedication displayed by all of the researchers with whom I have worked over so many years. Without this dedication I doubt we would have the standard of excellence which now exists in the grapevine and citrus propagule production and distribution schemes.