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Unforeseen Consequences[©]

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INTRODUCTION

Every person on earth has an individual view of the world. This is influenced by the culture in which we are raised, by our education, and by individual experiences as we pass through life. Misunderstandings often arise when discussing a topic if we do not check out the other person's perceptions, or we do not clearly explain our own. I trained as a plant pathologist and converted myself into a plant breeder of both fruiting and ornamental plants. As a consequence, I have a heightened awareness of the need to balance potential benefits from importing plants against the risks.

I also believe in collective custodianship, rather than the notion that naturally occurring plants or animals can be "owned" by anyone. By this, I mean that we live in a global village and have a shared responsibility to preserve biodiversity worldwide. We do not just have responsibility for the plants and animals that happened to have evolved within New Zealand.

IMPORTANCE OF GERMLASM

Economically New Zealand's rural industries are almost totally based on exotic germplasm, whether this be pine trees (*Pinus radiata*), roses, or cows. As a consequence, New Zealand has frequently acted as an unwitting Noah's Ark. Cultivars of several genera that have been lost elsewhere in the world have survived in gardens here in New Zealand. A good example is *Cosmos atrosanguineus*, the chocolate-scented cosmos. This plant is a native of Mexico, but has died out in its country of origin. Fifty years ago this plant was normally raised from seed. With the advent of tissue culture propagation a single clone was disseminated worldwide, displacing other strains. Individual plants of many members of the Asteraceae are self-incompatible and without other plants that are genetically distinct they are unable to set seed. This is the case with the clone currently available commercially. All vegetatively propagated cultivars become less thrifty over time and the plant was potentially in danger of being lost to cultivation as well as in the wild. Fortunately Russell Poulter of Dunedin was able to locate some remnant plants of *Cosmos atrosanguineus* that predated the tissue-cultured strain and the possibility to reestablish and further develop the plant now exists.

Plant breeding depends on variation. Some genera exhibit a great deal of variation, while others show very little. I liken a gene pool to a box of toy bricks. The more bricks you have, the greater the possibility to produce something new. In horticulture a gene pool is simply a good collection of plants of a specific genus. However, it is important to recognize that it is extremely difficult to maintain and curate a collection over any length of time. We all lose cultivars, however careful we may be. Without constant topping up, all collections erode very quickly. It is also extremely important not to confuse the maintenance of wide diversity in a collection with simply stirring a diminishing gene pool. Very many of our garden plants have been developed from a very limited base. Often only just a few plants from a single location were introduced to cultivation and most variation that now exists has been created in cultivation.

In contrast, in nature, species have evolved over many millions of years and variant forms within species have developed that are especially well adapted to specific ecological niches. Such forms are called ecotypes and often the locations where they have evolved are very limited. In forestry it is recognized that matching a specific ecotype to specific areas where the trees are to be grown is very important, a concept known as provenance.

Provenance is equally important in ornamental horticulture and it is essential that an ongoing stream of ecotypes of species already here in New Zealand be maintained. In addition, it is essential that the ability to introduce and test species not yet established here be restored. Bear in mind that most ecotypes from the wild are very difficult to establish, let alone maintain in cultivation. Very few have any weed potential.

INTRODUCING PLANTS

There was a time when the introduction of new plants and animals was seen to be virtuous. Until recently Government Departments were actively engaged in the responsible importation and evaluation of species and crops new to New Zealand. I was engaged in such activity during the 1980s with the Department of Scientific and Industrial Research (DSIR). Equally Acclimatisation Societies were active through much of the nineteenth and twentieth centuries, but now bodies such as the Department of Conservation promulgate the dogma “Native good—Exotic evil.”

For me, breeding ornamental plants is an art form comparable to painting, sculpture, or music. In addition to their intrinsic values, all have a commercial component. It is curious that the current Government is doing much to promote and encourage popular music in New Zealand, but at the same time is doing all it can to make the breeding of ornamental plants nonviable. I feel sure that this cannot be deliberate, but has arisen through the inability to understand the time scales involved in breeding and to be able to see the wider picture. Various Acts have been put in place with good intentions together with huge bureaucracies to implement them. Currently the Ministry of Agriculture and Forestry (MAF), the Environmental Risk Management Authority (ERMA), Biosecurity New Zealand, the Department of Conservation (DoC), and Agriquality New Zealand are the key players, and others such as local authorities also seem keen to get involved.

The interaction of these authorities and subsequent iteration appears like a classic formula of chaos theory. Compliance costs and fees alone make the importation and testing of species untenable.

It is important to understand that there are no really big players involved in the ornamental plant industry in New Zealand. The larger nurseries can justify limited importation of relatively mundane plants developed overseas, as they can be sold and expenses may be recovered within a few years. In contrast, no one is able or willing to bear the cost of importing a little known species that may or may not offer some possibility of genuine innovation. It is interesting that plants that were to become the kiwifruit (*Actinidia*), and major export cut flower crops *Zantedeschia* and *Sandersonia*, were introduced to New Zealand by enthusiasts. Their establishment and initial screening for suitability to New Zealand conditions took place informally and at no great cost. In contrast, over three decades of planned introductions undertaken by the former Department of Scientific and Industrial Research were thrown away as a result of the establishment of Crown Research Institutes and their pseudo-commercial philosophy.

Currently border controls are so draconian that amateur enthusiasts cannot bring anything back from an overseas trip and are even denied the opportunity to participate in long established seed distribution schemes such as those run by the Royal Horticultural and Hardy Plant Societies in Britain. Many overseas seed companies will no longer supply catalogues to customers in New Zealand as the difficulties and costs involved in sending seed to New Zealand make it not economic.

THE FUTURE

New Zealand is a very small and remote country. Because of our European heritage, a wealth of plant material has been brought here from around the world dating from the very earliest days of settlement. This has enabled us to be a player on the global stage. If we continue on the current course we will become an insignificant horticultural backwater. Regrettably, as things stand, I have to say to any young people wanting to breed plants — “New Zealand is no longer the place to do it.” Negatives are always difficult to recognise and with the long time lines involved it will probably be a quarter of a century or more before the next generation is left wondering why New Zealand has nothing new to offer world horticulture.