

- 6) Environment. Initially after potting, plants need to be kept under low light with high humidity to reduce any transpiration stress.

Extremes of temperature need to be avoided as well.

Once plants are established and growing well, they are regularly inspected and screened for disease. Virus indexing, if required commences in spring. Herbaceous indexing is completed in 6 to 8 weeks whilst woody indexing may take between 1 to 2 years depending on the crop being tested. Plants are recommended for release when all of the active testing and disease screening is completed with negative results and the minimum growing time has been achieved.

SUMMARY

Post-entry quarantine as described at the Plant Quarantine Nursery, Knoxfield, allows agricultural and horticultural industries access to imported plant material without introducing exotic pests and diseases into Australia. In the previous year (2001) at PQN, Knoxfield, exotic diseases were detected on chestnuts (chestnut blight), blueberries (blueberry rust), and grape vines (corky bark). All of the infected plants were destroyed. Plants released in the previous year (2001) include 102 cultivars of stone fruit, 48 cultivars of berry fruit, and 97 cultivars of grapevine.

Successful disease screening is dependent on successful horticultural practices and the number of plants failing to "grow away" after arriving in post-entry quarantine is minimised by the techniques performed.

Plant Importation[®]

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The papers by Australian Quarantine and Inspection Services (AQIS) staff outlined many of the legal and formal issues covering importation, as well as what happens to the plants when they come into the country. I am going to cover the actual importation of the plants from a growers perspective.

Plants can either be bought in by person as accompanying baggage or by mail/freight. It is much better to accompany the plants as life will be easier if you are present when the plants are inspected. It is also cheaper.

AQIS is charged with protecting our environment. They will look at plants as a possible disease host and as a potential weed. With the recent discoveries of fire ants, the problems with foot and mouth in the U.K. and the threats of terrorism, AQIS has increased its level and intensity of inspection. Whereas in the past some parcels may have come through the postal system without inspection, it is unlikely this will occur now.

There are three ways that a plant can be imported: seed, plant, and tissue culture. The restrictions vary from one plant variety to another and may also be dependent on the originating country. The level of restriction is related to the level of risk. John explained that there are three risk levels based on the weed potential, disease potential, and relationship to plants of significant economic importance.

The easiest method is via seed. An import permit is not required for seed although there are still restrictions (these are detailed in the ICON database). In general seed will be inspected for contamination and where possible identification. The

AQIS inspectors are much happier if the seed is sourced from a professional and reputable seed supplier. They feel that there is less chance of misidentification and contamination if the seeds are collected and packed by professionals. If there is any doubt about the quality, health, or identification the seed will be destroyed.

The second way is via tissue culture. This is the best way to introduce new taxa as restrictions are less and chances of survival substantially higher than with live plants. Tissue-cultured plants require a permit and the level of risk will be detailed on the permit. Most low- and medium-risk plants can be released to the importer after inspection, which means that large quantities can be imported and numbers quickly bulked up.

Tissue-cultured plants must be growing in the agar, in rigid containers and have no contamination. It is sensible for the supplier to inspect the tubs prior to dispatch as contaminated containers can be withdrawn at this stage. If there is low level contamination on the agar the individual container will be kept. If the contamination is on the plant then the individual batch will be held in quarantine for 5 days. If there is greater than 5% of the containers with contamination then all the plants of that taxa in the consignment will be held for 5 days.

It is also wise for the importer to check the import conditions prior to ordering the cultures. Some taxa have to be grown in a charcoal-based media. This is usually dark in colour and is not allowed without prior approval from AQIS. Other taxa may have a requirement that the local quarantine department inspects them prior to departure. Simple problems to solve prior to dispatch but impossible to solve once the plants are here.

There is a series of laboratories around the world that have been accepted by AQIS as being of a high standard and are allowed to deflask the plantlets prior to dispatch. These are referred to as washed plants and come under the same requirements as the ones in the agar. The only exception is that they require a phytosanitary certificate stating that they were grown at the specified laboratory, were washed under supervision from their local quarantine service, and were then packed and sealed.

High-risk varieties will have certain conditions imposed. These may involve simple deflasking and growing in a private quarantine facility, or may involve the plants being deflasked in a government quarantine facility, virus indexed, and grown on for several years. In this case it is not a quick or cheap way of bulking up stock. Although if the rules are this strict for the tissue-cultured material, it will be even harder for the live plants.

Finally, plants can come in as "live plants". There are quite strict conditions on the importation of live plants. The worst is that the majority of plants will be gassed with methyl bromide. Over the years AQIS has developed a list of plants that do not have to be gassed but are closely inspected and if found to be completely free from insects and disease will be dipped in an approved dip. This is because these plants will die when treated with methyl bromide. One of our main lines is lavender. In 1994 they were approved for dipping and since then there have been numerous taxa imported. A couple of times we have had an insect or two on the plant and these were sent off for gassing. The gassed plants were dead by the time they got to the nursery.

In an ideal world the plants should be healthy and nonstressed prior to packing. If this were the case there would be much higher survival rates. Bare-rooting a plant results in severe stress to the plant, especially if they have been grown in a "heavy" mix. By the time you are ready to prepare the plants for packing they have usually traveled a considerable distance, are often water stressed, and have been physically knocked about. Bare-rooted plants do give you a chance to see how well they have been grown. I have found that so often the original root ball is still present, i.e. the shape of the initial tube is quite obvious.

The plants need to be packed with a moist cloth around the roots to prevent desiccation. However the foliage needs to be kept dry. For many plants, wet foliage in a dark, cool environment for several days is a fatal combination. These plants will not survive the gassing and subsequent potting. It is best if you do the packing yourself, as you can ensure that they are cleaned properly and, most importantly, labelled correctly. Many a plant has been imported into Australia with an incorrect name. This has caused great problems both for the users of the plant and for professionals, as the description in texts never matches the plant. I suggest that at least two labels are attached to each plant to help avoid this problem. They are your plants and your future. You will take much greater care than another nursery or shipping agent.

A full list of the plants should be placed in the box. It is also advisable to send a copy to the relevant AQIS office so that they can prepare themselves. Give them the full plant name and all flight details. Anything that can be done to make their life easier will save you time, money, and hassle. It is also advisable to inform the relevant gassing company that their services will be required, as they do not all run their chambers every day. Others only run them once a day and may hold the run until your plants arrive, if they know they are coming. The aim is to get your plants back into pots as soon as possible. One trick is to ensure that your return flight is on a week day morning.

Precooling the plants prior to packing seems to be beneficial. I suspect that it reduces the sap flow and slows down any biological activity. It is best if the packing can be done as close to departure as possible.

Be prepared to lose a good percentage of the plants. The best I have had is about 90% survival, the worst 0%. On a trip to South Africa every one of 30 taxa died. It is extremely disheartening but there is nothing that can be done. I firmly believe that it is worth going and getting the plants in person. I recently bought a collection of 40 lavenders from a collector in New Zealand. When he packed them there were two bugs in the box. AQIS then sent them all off for gassing and they promptly died. The exercise cost me several hundred dollars and I ended up with nothing. If I had been there I would have packed them differently and made sure there were no bugs.

In summary, yes plants can be imported but it is hard work and requires careful attention to detail. If everything is done properly there is still no guarantee of success. However if we did not have people travelling the world to find new and wonderful plants, our gardens, businesses, and culture would be so much the poorer.