

Growing and Propagating Conifers®

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BEGINNINGS

Noeline and David started Cedar Lodge Nurseries over 30 years ago, developing it from a hobby. We had an interest in conifers, and thought that by specializing in only conifers we could handle it quite easily. What we soon found out is that we had taken on the world's largest family of plants. This created many challenges since every continent has its native conifers, with climate requirements varying from the tropics to close to the Arctic Circle. These climatic requirement variations didn't prove much of a problem from a propagating point of view but the continuing management of the young plants through to sale required a lot of experimentation with varying plant husbandry techniques, which continues today. We are blessed with a wonderful temperate climate in our locality, which allows us to handle this challenge and produce plants that can survive and thrive in their preferred climate range, which can be found in most cases within New Zealand.

THE CONIFER FAMILY

We have found out these plants are not one of the glamour plants and don't attract a lot of passion amongst the majority of the New Zealand gardening public. But may I suggest that it is the most important family of plants in the world today. For those that champion global warming it is the conifer that will provide most of the forests of the future to soak up the harmful carbon dioxide gases, it is the conifer that will provide most of the cover to protect the world's land from erosion and improve the quality of our precious waterways, and it is the conifer that will provide for most of the world's future wood requirements. There is no genuine substitute for wood in the world, and with the diminishing reserves, the humble conifer will play a huge part in saving our environment as well as provide for our future needs. Cedar Lodge produces a lot of the fancy conifer cultivars, but we also have and produce many of the species. It is these species that I believe will become more important as time goes on. It is with pleasure that I now ask our son Greg, who has taken over our business 3 years ago, to continue.

PEST AND DISEASE CONTROL IN THE PROPAGATION OF CONIFERS

I find it more than a little ironic that I have been given the job of delivering a paper at this conference, as I have never actually partaken in propagation to any degree. So here I go, the blind preaching to the experts.

Sciarid Fly (*Lycoriella* Species) in Propagation. A pesky little beast that we've had problems with for many years but only realized what the problem was about 6 years ago. We thought these little white larvae were a secondary infection of the soft fleshy tissue of *Cryptomeria japonica*. I'm actually not convinced yet that they aren't a secondary problem in some cases, but we tried several treatments using a range of insecticides as a drench with no success. Then we tried using the sciarid fly predator mite (*Hypoaspis* species), fantastic little creatures that move very fast.

The problem was even the smallest piece of dog biscuit in the house was smothered in mites, so I decided that the all or nothing approach was required until the mites had finished with the caviar and moved onto the main course. We firstly had a major clean up of the propagation house, removing all algae and moss, renewing sand beds, then dusting the tops of the root trainers with Vecto Bac (*Bacillus thuringiensis* subsp. *israelensis*) (Nufarm, New Zealand). I then started a spray programme of three sprays per week using Karate (lambda-cyhalothrin) (Syngenta Crop Protection), Attack (permethrin and pirimiphos-methyl) (Nufarm, New Zealand), and Decis Forte (deltamethrin) (Bayer Crop Science) in rotation. At this point we hung several yellow sticky tapes in the house to monitor the adult population. Almost over night we had results, with the adult population showing a sharp decline. This in turn almost stopped any new infection, so to this day we have stayed with this spray programme.

The Use of Fungicides in the Propagation House. For the last 10 years, we regularly applied fungicides in the propagation house every couple of weeks. We then introduced the Trichoprotection (Agrimm Technologies Ltd., Christchurch) range of products. We started introducing Trichopel (*Trichoderma* sp.) (Agrimm Technologies Ltd., Christchurch) into our propagation mix and introduced Trichorhiza (*Trichoderma* sp.) (Agrimm Technologies Ltd., Christchurch) into our growing on line mix. We then topped up the Trichorhiza at every repotting, bearing in mind we are dealing with at least a 3-year crop in most cases. This meant the yearly inoculation was required. Unfortunately Trichorhiza is no longer produced or available in New Zealand. The interesting result we found in propagation was that the use of Trichopel in our propagation mix dramatically reduced the need for fungicides to the point that now we no longer spray fungicides in the house at all. There is always a drawback, and in our case it came in the form of mice as they seem to quite like Trichopel. Mice bait seems to fix that problem easily. Following on with the use of Trichopel in the nursery we have continued its use throughout production through to point of sale with a view to improving general plant health especially with *Phytophthora* in mind.

The Control of *Phytophthora* in the Nursery. To keep up with the control of *Phytophthora* we have found several strings to the bow are needed. Bearing in mind *Phytophthora* thrives in warm temperatures and moist media, all susceptible plants are placed in one area of the nursery.

In this way we are able to manage these plants in such a manner as to reduce the occurrence of *Phytophthora* by limiting watering through the summer months to one heavy watering every 10 days or so if we've had no significant rain fall. We are also able to apply shade to plants to reduce the temperature of the pots. In the case of PB 2 or 14-cm grades, leave a gap between the pots instead of having them placed hard together so as to facilitate air movement between them, therefore keeping the pots cooler. We also use Aliette (fosetyl-aluminium) (Bayer Crop Science) as a preventive spray with *Taxus*, *Chamaecyparis lawsoniana*, and *Araucaria araucana* (monkey puzzle) being our most troublesome subjects. Bearing in mind root damage is likely to happen during this handling procedure, repotting *Phytophthora* susceptible plants should only be done in winter. The plant is given time to heal before *Phytophthora* becomes active in the growing medium. The efforts to promote autumn planting would help this cause since a customer planting in spring, often

late spring, puts the plant under real stress, particularly the modern trend of automatic watering systems pumping water on in summer can be a death sentence. At this point I have suddenly realized, as I prepare to move onto my next subject, that I seem to have a subconscious problem with all things fungi.

Cypress Canker (*Seiridium* Species) in Conifers. I think this would be the biggest single issue with growing conifers in New Zealand if not throughout the world. The first and most important issue is the health of the stock plant that cuttings are to be collected from, because these stock plants must be disease free. I don't consider collecting cuttings from an infected plant or collecting only from the healthy or what appears to be the uninfected portion of the plant, to be good enough. To say, "These cuttings are clean and free of cypress canker" is misleading, because I think everyone is aware that cypress canker is a fungal disease of the sap flow system and therefore may well be translocating throughout the plant with only minimal visual effect being shown. Now I would like to move into what maybe a slightly contentious view I have, looking at a species that is most susceptible to this disease and may be most grown, or most propagated, *C. lawsoniana* cultivars. A fantastic plant for most areas of the South Island but almost useless in most areas of the North Island. So why do we see this plant in the North Island garden centres and more especially those in the upper North Island?

To put a global slant on the situation we need to look at Europe as a good example. Are all plants grown in the Netherlands sold throughout Europe? No, the Dutch nurseries target markets like Italy with plants that are suited to the Italian climate, just as nurseries in the United Kingdom have target markets throughout Europe, but all are dependent on the climate they are selling to. I believe we, in little old New Zealand, think "no worries, grow it here, sell it there," but I don't think we can. In a lot of cases this species shows the devastating affects of cypress canker all over the upper half of the North Island and most of these are, I'm sure, propagated and grown on in the South Island. Only a small percentage of conifers are susceptible to *Phytophthora* and cypress canker attack, but many of them are planted outside their preferred climate range, with disastrous results, giving all conifers a bad reputation. I recommend that more attention from propagators be given to cutting selection and nurseries should offer plants for sale into areas more suitable for their survival.