

Government Regulations and Nursery Accreditation

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There have been many changes to government regulations and operational strategies and policies which may have significant impact on nurserymen throughout Australia. I will discuss accreditation and water management regulations and their implications for nurserymen through examples.

The Eltham Shire in Victoria is introducing a Pest Plants Local Law to ban or restrict sales of environmental weeds from nurseries. Similarly, there have been government initiatives on a national weed strategy and more rigorous policing on noxious weed regulations. There has been more emphasis on health and safety issues and the environment. Examples include changes to pesticide regulations and safe work practices.

Government organisations and, in particular, the Australian Quarantine Inspection Service, have changed significantly. This will influence the importation of PVR plants and the development of plant exports.

There is obviously an emphasis on the environment and regulations that will minimise pollution. Probably the most significant development is the NSW Clean Waters Act and similar legislation proposed in other states.

HISTORY OF NURSERY ACCREDITATION

I will first discuss nursery accreditation and the implications and benefits for nurserymen.

There have been various plant improvement programs and accreditation schemes. Of the current state accreditation schemes the Victorian and Northern Territory schemes are the longest running. The Minister for Agriculture launched the Victorian scheme on the 11 July 1989. Now there are 18 accredited nurseries, including two specialist propagation nurseries.

Western Australia and Queensland have more recently developed accreditation schemes and Tasmania, South Australia, and New South Wales are working towards accreditation. In August 1992, representatives of all state nursery associations met to discuss the introduction of a national accreditation scheme. The administrative requirements and the first draft of the technical criteria have been prepared.

ADVANTAGES AND BENEFITS OF NURSERY ACCREDITATION

The ultimate advantage of any scheme should be increased profits. This will come from improved nursery practices and increased consumer confidence in products sold by accredited nurseries and allied trades.

In Victoria, the aim was to improve the quality of nursery stock and to minimise diseases including those caused by *Phytophthora* species. This scheme has applied only to production nurseries. The Victorian scheme was based on quality management throughout the production process. Similar schemes in the past have failed because of the emphasis on a regulatory approach. In Western Australia, the state government applied pressure to stop the spread of *Phytophthora* root rot to native

forests. The Queensland scheme was based on the Victorian and Western Australian schemes. It has a greater emphasis on *Phytophthora* species control, though this is not due to government pressure as in Western Australia.

The state nursery industry associations administer accreditation, however, they all have government involvement in the establishment and maintenance of standards. Participation is voluntary in most state schemes.

The national Nursery Industry Accreditation Scheme of Australia will operate through the Nursery Industry Association of Australia and state industry associations. It will be open to all nurseries and will be voluntary.

ACCREDITATION ASSESSMENT

The assessment criteria include:

General criteria

- General appearance of the nursery
- Growing structures
- Storage areas—pesticides, containers, media
- Propagation plant material
- General hygiene
- Plant protection practices, plant nutrition, and safe handling of pesticides—spray program, equipment, safe handling
- General vigour and appearance of plants
- Irrigation and water supply
- Disposal of waste

The emphasis and importance of these criteria may vary with the type of nursery. For example, propagation facilities, practices, and hygiene are emphasised in specialist propagation nurseries.

Nursery accreditation is not another name for government regulation. It is self regulation by the industry, and should be based on quality management throughout the production process. Elimination of *Phytophthora* species from the nursery industry is a commendable objective, but probably not achievable in practice. The improvement in productivity and quality achieved through participation in accreditation is a real and achievable objective.

WATER TREATMENT AND RECYCLING

The recycling of nursery runoff and treatment to control pathogens is a significant issue locally and overseas.

LOCAL WATER MANAGEMENT LEGISLATION

You should all be aware of the NSW Clean Waters Act and the implications for all nurserymen. In NSW, it is an offence to pollute any waters. The Act establishes limits for various substances—including insecticides, fungicides, herbicides, and fertilizers—contaminating surface and groundwater.

Other Australian states have environment protection legislation that can apply to nursery runoff. In Victoria, government inspectors have investigated complaints of tree damage downstream from nurseries, with particular emphasis on herbicides used in the nursery. This is a significant issue for most states and the relevant

government departments are developing policies and eventually regulations to control the discharge from nurseries.

In the United States, private individuals have taken court action against organizations involved in polluting local rivers. Many of these cases have resulted in multimillion-dollar settlements against the offenders. This is possible under local legislation.

In the United States and Europe there are very strict controls on drainage from nurseries and water recycling is becoming more common.

IMPLICATIONS OF REGULATIONS FOR NURSERYMEN

For the reasons outlined above, it is becoming more important for nurserymen to consider water conservation and recycling.

Recycled water should be treated to control plant pathogens. The incidence and extent of *Phytophthora* and other water-borne pathogens in nurseries are such that water recycling without treatment will lead to increased losses due to root rot.

Potting media may be suppressive to *Phytophthora* and other pathogens. However, the presence of these pathogens will cause losses during periods of water stress or after planting in the garden. Effective treatment of recycled water and other hygiene practices can eliminate this problem. To comply with regulations, production areas could be covered to collect and direct water to tanks for recycling. Concrete, bitumen, or heavy grade black plastic covered by screenings could be used to prevent water entering the soil. It may be necessary to store the first 35 mm of rain falling on the nursery site.

CHALLENGES IN WATER MANAGEMENT IN NURSERIES

Fertilizer and pesticide residues in nursery runoff may not contribute significantly to contamination of ground and surface water compared with discharge from industrial and domestic sources. However, the regulations will still apply. Research has commenced to evaluate fertiliser runoff from various agricultural and horticultural situations to help clarify the situation.

There are other water management problems facing nurserymen. There is increasing pressure to improve the efficiency of water use due to the increasing cost of water and the associated labour and equipment costs. In response to government pressure, some industries have made significant savings through recycling and improved production practices.

PRACTICAL SOLUTIONS TO WATER MANAGEMENT PROBLEMS

Some problems facing nurserymen include:

- Reduce waste water from container standing areas
- Reduce water cost and labour associated with hand watering
- Increasing water supply by collecting runoff
- Maximise irrigation efficiency but maintaining growth
- Concerns over nitrate and phosphate content in runoff
- Regulations or impending Regulations controlling runoff
- Reduce fertilizer use by monitoring plant needs

Possible solutions include:

- Grade pot standing areas to direct runoff to a tank
- Use of drip irrigation systems
- Increased size of dams to collect all runoff
- Optimise potting media and water use
- Use of "water-saving" polymers and wetting agents
- Computer control of irrigation management and fertilizer addition based on environmental monitoring
- Use of more efficient irrigation equipment and practices and relating use to need
- Pulse watering allows water to soak in before more is applied
- Growing drought tolerant plants
- Grass strips between rows to filter runoff
- Use of antidesiccants and wetting agents
- Monitoring nutrient levels in recycled water and adjustments to supply the plants needs
- Adopt capillary or ebb and flow watering systems
- Use and management of appropriate controlled-release fertilizers which only supply the plant requirements

WATER TREATMENT IN ACCREDITED NURSERIES

Treat recycled water before use. As propagators, you should be aware of the potential problems caused by water-borne pathogens and the need to minimise or eliminate disease. There are many water treatment systems available; however, they are not equally effective in treating irrigation water.

Some recent installations have concentrated on the engineering required to mix the treatment chemical or gas with the irrigation water. It is important to first evaluate the efficacy of the technique proposed and then consider the installation. In my experience, each nursery situation is unique and what may be effective and economic in one nursery may be totally inadequate in another.

Consider the source of water, the chance of serious pathogens, the amount of suspended particles, the amount of organic matter, and the use of the treated water.

Chlorine will kill plant pathogens if the concentration (minimum 2 ppm) and contact time (minimum 20 min) are sufficient. However, increasing organic matter or suspended particles will reduce the efficacy of treatments.

AVAILABLE WATER TREATMENT SYSTEMS

The following are readily available water treatment systems that may have application in nurseries. The price may range from \$2000 to \$30,000 for an average nursery. Efficacy and reliability of these systems may also vary significantly. The following lists some available systems.

Liquid Chlorine

- Usually sodium hypochlorite
- Inexpensive to install if flow is constant (<\$1000 depending on available equipment e.g. tanks)
- Injection rates can be controlled automatically, though this adds significantly to the cost

- Best used with storage tanks to provide sufficient contact time
- Higher concentrations required for “dirty” water supplies
- Equipment will rapidly corrode at higher concentrations (>3 ppm)
- Sodium hypochlorite is alkaline and may cause problems with alkaline water supplies
- Chlorine is less effective in alkaline water and the dose must be increased to be effective

Chlorine Gas Injection

- Similar to liquid chlorine, though it will acidify water
- Chlorine gas is dangerous and requires special precautions

Brominators (Erosion Feed System)

- Bromine is more effective than chlorine at higher pH
- Some equipment on the market may be unreliable and inaccurate
- Inexpensive (<\$2000)

UV with Ozone

- The amount of ozone produced by UV tubes may be too low to be effective
- Very expensive for higher flow rates (\$20,000 to \$30,000)

Ozone

- Ozone is generated by corona discharge
- Ozone in sufficient concentration is considered the best method for sterilising water
- Very expensive to install (> \$30,000)

Microfiltration

- Filtration to less than 5 microns is effective though generally not practical for most nursery situations
- Expensive for higher flow rates

Chlorine Dioxide

- Widely used overseas for water treatment
- More effective for controlling *Phytophthora cinnamomi* than liquid chlorine at low doses (unsubstantiated nursery trials)
- Moderately expensive though systems are well engineered and likely to be very reliable (\$10,000 to \$15,000)

As nurseries move towards water conservation and recycling, the need to effectively control water-borne pathogens in irrigation water has become increasingly important. Consider why you are installing the system and ensure that it is likely to be effective. Ensure that the suppliers and installers of equipment are aware of the biological requirements for controlling plant pathogens and then consider whether they can provide and install well engineered and reliable equipment.