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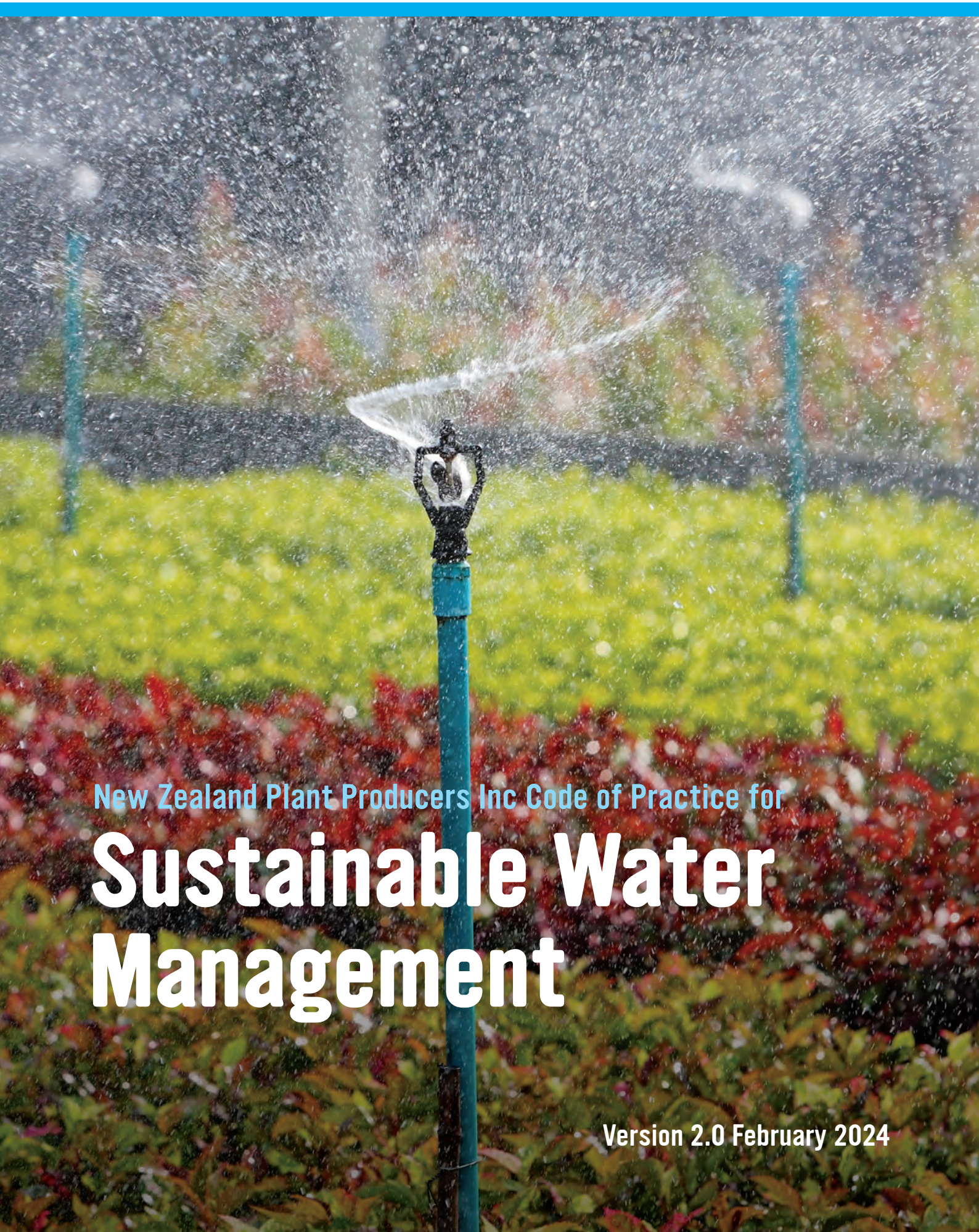
NEW ZEALAND PLANT PRODUCERS INCORPORATED



New Zealand Plant Producers Inc Code of Practice for

Sustainable Water Management

Version 2.0 February 2024

Acknowledgements

NZPPI (New Zealand Plant Producers Incorporated) acknowledges and is appreciative of the support from industry members and stakeholders who assisted in the development of the Industry Code of Practice for Sustainable Water Management (CoP).

Revisions

Revisions will be ongoing as experience and/or new practices inform the need for change.

Revisions will be published on NZPPI's website and participants advised of the updates to ensure that they are referring to the most recent documents. Those wishing to provide recommendations for change should send these in writing to NZPPI, PO Box 3443, Wellington 6041, or by email to office@nzppi.co.nz.

Disclaimer

This CoPs objective is to inform plant producers and garden retailers and encourage their use of best practice in sustainable water management. However, this CoP is for general information purposes only and must be applied considering the circumstances that prevail at any nursery or garden retailer. No liability is assumed or accepted by NZPPI for any losses suffered by any person or organisation relying directly or indirectly on, or impacted by, the information published in this CoP.

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INTRODUCTION

Access to water use is an increasing issue for our industry involved with plants. Water resources, climate variability, severe water restrictions, increased costs and social license continue to put pressure on our industry to manage water use efficiency.

The Industry Code of Practice (CoP) for Sustainable Water Management is an initiative by New Zealand Plant Producers Incorporated (NZPPI), aimed at addressing the responsible and sustainable use of water within the plant production and retail garden sectors.

New Zealand's plant production industry is diverse and includes plant producers (nurseries) that propagate and grow plants for garden retailers and home gardeners and others growing food, producing wine, planting forests, undertaking ecological restoration and revegetation, infrastructure, and urban amenity and landscape development.

The industry comprises some 500 businesses, contributing about $500 million per annum to GDP and, employing around 4,000 people. Most are small to medium enterprises, many comprising owner operators and a few workers.

The industry is among the most vulnerable to any disruption to water supply. Water is its lifeblood, critical for plant health and growth, and the wellbeing and livelihood of the business owners and the people they employ.

The CoP acknowledges the critical role of water in ensuring the health, growth, and sustainability of plant life, which in turn supports the livelihoods and well-being of all stakeholders within the supply chain and the community.

It recognises the important role that plants play in meeting the economic, environmental and wellbeing goals of our regions and communities, including horticulture, viticulture, greenlife, native and exotic reforestation, carbon sinks, urban regeneration and for the gardens that underpins food security and wellbeing.

THE GUIDELINES

This document lays out a framework for efficient, effective, and responsible water use, aiming to balance the need to access water for producing and maintaining plants without compromising the availability of water for others.

By adopting this Code, plant producers and garden retailers demonstrate their competence in efficient water usage, resilience in times of water scarcity, and environmental responsibility. Moreover, it shows the industry's collective action towards sustainable water management, contributing significantly to the well-being of communities and the preservation of natural resources.

The CoP describes appropriate and practical steps plant producers and garden retailers can take to sustainably manage their water use. It's intended to adapt to the needs of all plant producers and garden retailers and can be used by all, from the smallest to largest, by commercial and community nurseries and garden retailers irrespective of what they grow, how they grow it or who they supply

It focuses on putting the right amount of water on the right place at the right time.

The CoP encompasses best practice in management and worker responsibly, water sources and usage, measuring and monitoring, and increasing irrigation efficiency and reducing waste.

PART A: Governance
This section describes how plant producers and garden retailers can adopt the CoP.

PART B: Sustainable Water Management Fundamentals
This section identifies key components of best practice in sustainable water management.

PART C: Task Specifics
This section identifies specific tasks within a business' operation that impact on sustainable water management.

PART D: Record management
This section describes requirements for records management.

PART E: Public education
This section describes how plant producers and garden retailers can help raise public awareness and performance in sustainable water use.

Note, that for simplicity through the rest of this document, the industry that comprises plant producers (nurseries), garden retailers is referred to as the "industry", and the entities within the industry working under this CoP are referred to as "business(es)".

PART A: Governance

This section describes how businesses can adopt the Code of Practice.

Business details

Information is required to identify the business and the nature of its operation. This includes the sites where the business operates, the nature of the working environment and its production system.

Key demonstration

1. Business name, location and contacts.
2. The nature of your business, example nursery, retailer, grower/retailer ...
3. A list of sites where you operate and a brief description of the working environment, its production system and water sources.
4. Operational location maps showing key production and water infrastructure.

Management Responsibilities

Nursery management has a key role in planning, implementation and maintaining sustainable water management practices. It is also a critical driver in building awareness and a proactive culture through the business and among the team.

The business shall assign responsibility for implementing the CoP. This involves the planning, implementation, monitoring and maintenance of CoP procedures and the documentation of these in a manual or elsewhere.

The person responsible may assign responsibility for the day to day actions.

Key demonstration

1. Who is responsible for the implementing the CoP?
2. Does this include ensuring that staff are aware of their roles in responsible water use?
3. How is adherence to good practice monitored?
4. Are there opportunities for staff to report issues?

A Systems Approach

The business needs to understand the fundamentals of their water management approach and implement a system of best practice. This includes a basic understanding of water sources and consumption and position on sustainable water management.

A systems approach comprises repeated review, plan, do and check cycles.

- **Review –** Work through the CoP to assess current performance.
- **Plan –** What needs doing, who will do it and when.
- **Do –** Assign roles/responsibilities, act and build, undertake training, build document control and record keeping, communicate to stakeholders.
- **Check –** Monitor and measure how its working, do an annual review, self-assessment on the programme and/or procedures.

... and repeat. With incremental and continuous improvements, performance in sustainable water management will grow.

These processes should be documented in a "Nursery Manual" or stored in some such other method to provide a body of evidence and actions if required.

Key demonstration

1. Is irrigation and water use part of routine operational planning?
2. Measures in place to undertake routine task management reviews around water consumption.
3. Annual self-assessment against the CoP checklist, identifying non-conformances and undertaking corrective actions (if any).
4. Annual review of business environment to ensure sustainable water management practices are up to date and relevant for all parts of their operations. Creating new or updating procedures, and taking corrective actions as needed.

Water Source and Usage

Understanding water sources and usage is a critical component of sustainable water management.

List water sources, access rights (what are the conditions on any permit for overall use and rate of use), and current usage. This will set a baseline against which to plan and measure improvements and benchmark future performance.

Assess the risks and the environmental impacts associated with current water sources and consider alternatives. These may include:

- Reticulated (example, town supply).
- Groundwater (bores).
- Surface water (rivers and lakes).
- Rainwater harvesting and storage into dams.
- Rainwater – direct use of rainwater in uncovered areas, that is, irrigation via natural precipitation.
- Rainwater collection from roof / drain run off onto storage tanks.

Key demonstration

1. Where required by the water provider, meter(s) installed, and usage recorded regularly.
2. Up to date water consents, permits or other water rights are in place.
3. An understanding of the source of your water, your right to its use, and the risks and environmental impacts of using this water.
4. Measures to reduce water usage at peak times or when restrictions are in place.
5. Alternative water sources have been considered and utilised where possible.
6. Where water is re-used, water quality monitoring is undertaken.

PART B: Sustainable Water Management Fundamentals

This section identifies key components of best practice in sustainable water management.

Irrigation systems

Irrigation water can be sourced from a wide range of primary sources, with varying levels of capacity, cost, quality and environmental impacts. Ensure irrigation systems are operating effectively. An irrigation system check, e.g. through winter, provides an opportunity to get ready for peak demand in spring and summer.

Key demonstration

1. A map that includes water sources, storage, irrigation infrastructure and equipment the business has.
2. Annual inspection of the irrigation system (leak check) has been undertaken and recorded.
3. Weekly checks of the water infrastructure and irrigation systems are carried out in times of water scarcity, or restrictions.
4. Repairs are recorded and identified maintenance is monitored and completed.
5. Consider improvement opportunities or upgrades of equipment.

Increasing efficiency of existing irrigation systems

Correct design and operation of water infrastructure is critical for effective and efficient watering, and hence plant health.

Controls can include but are not limited to:

- Ensure even and efficient coverage.
- Adjust timing of irrigation so not to over irrigate and create run off.
- Change layout, rotation, or create zones that can be customised in order to minimise irrigation of empty space.
- Change layout of stock and displays to best match irrigation patterns.
- Install moisture meters and/or rain sensors and timers.

Key demonstration

1. Assessment of irrigation coverage, eg a "catch can test[4]"
2. A system to check efficiencies of the irrigation system.
3. Electronic timers adjusted to match season / weather conditions with a moisture sensor override.
4. Placement of plants into zones of like water needs enables efficient water use.
5. Irrigation monitoring equipment, such as moisture meters / rain sensors are in place and operating.

Crop Health Monitoring

Understanding a plant's water needs and timely monitoring of plant health, including moisture requirements will enable a business to optimise water usage. Crop monitoring is essential, so a business knows when to water.

Key demonstration

1. Procedures are in place to monitor plants for signs of water stress ... too little or too much water.

Additional uses of water

Aside from watering plants, businesses should also monitor, manage and ensure best practice of other uses of water in their working environment, including worker amenities and washing down activities.

Key demonstration

1. Workers are aware that they should avoid any wasting water in worker facilities and report leaks.
2. Where appropriate, hard surfaces are swept rather than washed down.

Trigger nozzle and hose usage

A hose is an effective, selective and targeted method when used correctly. It can be used to apply water directly onto the roots/rootball of plants that need water, while avoiding those that do not.

Key demonstration

1. Nozzles, connectors and hoses are checked regularly.
2. There are standard procedures in place for hand watering.
3. Staff undertaking hand watering have been trained and this is recorded.

Capillary matting

Capillary matting provides a reservoir that plants in pots can draw upon as they dry out. It's an effective means to making sure the right amount of water is available as needed.

Mats however need to be checked and replaced from time to time to ensure evenness of wetting.

Key demonstration

1. A system to check and monitor capillary mat efficiency.

Note: If capillary matting is used for successive crops, clean between crops to ensure plant pathogens are not spread from prior to new crops.

Water loss reduction practices

There are several soft operational practices that can slow water evaporation and provide protection for plants. Controls can include but are not limited to increased use of:

- Shade
- Ventilation
- Windbreaks.

Key demonstration

1. A self-check that alternative systems have been explored and implemented where practical and relevant.

Worker training

A key element of sustainable water management is awareness amongst management and workers, of their roles and responsibilities across the water use issues and processes.

Awareness can include but is not limited to training in:

- How and when to water plants
- How to use equipment efficiency.

Key demonstration

1. Worker induction processes.
2. Worker training processes.
3. A record of training.

PART C: Task Specifics

This section identifies specific tasks within a business's operations that have impact on sustainable water management.

Growing media or Soil type

Growing media should be selected with the method of irrigation in mind as water absorption rates vary with media components.

For field nurseries, an understanding of the soil type(s) present and the water retention properties of this soil are critical for effective water management.

Key demonstration

1. A review of the water application rate in relation to the absorption rate of the growing media has been undertaken. One methodology for this is provided in the Australian's "Nursery Industry Water Management Best Management Practice Guidelines", see footnote.
2. For field production, soil samples have been taken, and maps of the nursery showing contours, drains, wetter and drier areas are shown. The irrigation system is designed based on the soil type and is specific to different blocks with different water needs.

Plant stock for propagation

Ensure that propagation stock is managed with sustainable water use in mind.

Key demonstration

1. A record of stock plant locations and the irrigation system used (if any) to water the stock plants.
2. Any water usage limitations of this system - this could include but is not limited to:
    - Overwatering due to uneven application.
    - Irrigation system discharge rate in excess of the growing media absorption rate.
3. Steps taken to minimise these limitations - this could include but is not limited to:
    - Wind protection.
    - Timing of irrigation.
    - Use of shade or ventilation for cooling, rather than water.
    - Re-using water.
    - Nozzle selection.

Integrated water management: Principles and best practice for water utilities | Water Services Association of Australia (wsaa.asn.au)

Containers (pots, bags, trays ...)

Ensure that plant containers are suitable for the irrigation method used. For example, containers used for effective capillary systems may be different to those best suited under overhead irrigation. In addition, operational issues can influence water use or waste.

Good potting practices

- Not filling pots to the top, allowing water to pool and seep in rather than overflow straight off the soil.
- Repot rootbound plants.

Key demonstration

1. An understanding of how to select the right container for your irrigation system.
2. Management strategies (such as grouping similar sized containers and plants that have similar water needs) to manage differing water needs of varying plants and container sizes.

Growing areas – all types

Plants in growing areas (greenhouses, container standing out beds, in the field etc) usually consume the largest amount of water in a nursery. Verify the irrigation system used to water plants in growing areas is the most efficient and appropriate. Include an assessment of the frost protection system (if any) in this process.

Key demonstration

1. A process to check and monitor growing area and frost protection irrigation systems.

Dispatch, plant distribution and transport

Plant dispatch processes are the last step in ensuring that a plant is healthy, not under/over watered and/or heat stressed. It is common practice to allow plant media to dry reducing the weight of the plant prior to transporting; take care not to over dry.

Key demonstration

1. Measures to avoid excessive drying or heating of plants during the dispatch and transport process, so that customers do not receive plants that are too dry.

Trusted suppliers and the inwards goods supply chain

Anything that is sourced off site is likely to have been produced using water. A business shall source materials only from suppliers who are committed to appropriate sustainable use of water.

Key demonstration

1. Knowledge of how trusted suppliers are assessed and established so that the producer has confidence that their supply chain is using water sustainably.
2. That plant suppliers (including carriers) have steps in place to avoid plants being under water stress on arrival.

Plant receipt by retailers

Where practicable, when plants arrive from a grower keep them in a location that protects them from water stress before they are brought into store.

Controls can include but are not limited to:

- Keeping on trolley or pallet in shaded area.
- Unpacking to a shaded area.
- Selectively watering if required.
- Visual check of plants wellbeing.

Key demonstration

1. A system to check and monitor procedures for receipting plants.
2. Where practicable plants are offloaded to a location that reduces heat/stress.

Retail sales

While plants are displayed for short periods, it's important to merchandise them by their water requirements. Dry loving plants will tolerate a sunny location. Moisture loving plants in a shady, cooler location – to lessen evaporative loss. Try to group plants by their water needs too, that way irrigation can be optimised without some plants getting too little water, and others getting too much.

Consider temporary base watering systems, for example trays, capillary matting, drippers ...

Controls can include but are not limited to:

- Merchandise plants by their requirements for sun or shade.
- Adjust locations to suit plant types their water requirements.
- Worker training - when and how to water plants.
- Daily walks and observations on plant status.
- Educate, influence and inform our customers on sustainable water management.

Key demonstration

1. A system to check and monitor procedures for merchandising plant types by water needs.
2. Where practicable plants are allocated to locations that reduce heat and water stress and save water.
3. Worker induction and best practice training processes.

PART D: Record Management

This section describes requirements for records management.

Record requirements

Good governance of this sustainable water management programme relies upon key records being maintained to demonstrate due process.

A good record and document control system provides the facility to maintain records for:

- Internal review.
- Crop monitoring details and findings.
- Training registers.

Key demonstration

- Records pertaining to the following should be kept for a minimum of 3 years:
  - Worker Training Register.
  - Water consumption data.
  - Internal review records.
  - Water test records.
  - Annual pre-season system check.

Where there is equivalence with another programme that requires a longer period, or a customer requires a longer period, then that period should apply.

PART E: Public Education

This section describes how plant producers and garden retailers can help raise public awareness and performance in sustainable water use.

Public education

An important component to successful garden planting is effective and efficient water usage.
As an industry, we have a role to educate the customer/consumer about sustainable use, including:

1. Explaining any local restrictions that are in place.
2. Provide information from the industry or water suppliers, e.g. posters and brochures.
3. Provide advice on how and when to plant plants.
4. The importance of how garden design, including species selection, impacts water use.
5. Soil, composting and mulching.
6. Rainwater tanks / re-harvesting – grey water use and management.

Annual Water Audit

Date: **Business:**

Address:

Person:

Area	Issue	Good to Go	Needs work	Action	Person responsible for action / Timeframe to implement
Management responsibilities	Have you designated a manager responsible for implementing the Code of Practice?	○	○		
	Is there a water management policy endorsed by senior management?	○	○		
Water source and usage	Have you identified all water sources and documented any water rights or restrictions?	○	○		
	Are water meters (or similar devices) installed and readings regularly recorded?	○	○		
Irrigation and water efficiency	Do you have a map detailing water sources, storage and irrigation infrastructure?	○	○		
	Have you conducted an annual inspection of your irrigation system for leaks or inefficiencies?	○	○		
	Is there a system in place for monitoring irrigation efficiency (e.g. catch-can test)?	○	○		

Area	Issue	Good to Go	Needs work	Action	Person responsible for action / Timeframe to implement
Crop and plant water needs	Have you established procedures to monitor plants for signs of water stress?	○	○		
	Are procedures in place to ensure that water is always available for high value plants, stock plants and propagation areas?	○	○		
Operational water use	Are you utilising water-efficient equipment? Have opportunites for improvement been considered?	○	○		
	Are regular checks for leaks been undertaken?	○	○		
	Have any leaks identified been addressed?	○	○		
Worker training and awareness	Have staff been trained on water policies and practices?	○	○		
	Are water policies and practices part of induction for new staff?	○	○		
Documentation and record keeping	Do you maintain records of water use, staff training and irrigation system maintenance?	○	○		
	Have you conducted an annual review of water management practices, identifying areas for improvement?	○	○		

Area	Issue	Good to Go	Needs work	Action	Person responsible for action / Timeframe to implement
Public and customer education	Does the business provide information to customers and the public about responsible water use? For example, website, social media, brochures.	○	○		
	Does the business provide information to the public relating to garden water use if there are regional water restrictions in place?	○	○		
Continuous improvement	Is there an action plan in place for addressing areas of improvement identified in your annual review?	○	○		

Weekly Water Audit

Date:

Site: **Completed by:**

Area	Issue	Good to Go	Needs work	Action	Person responsible for action / Timeframe to implement
Water sources and usage	Are all water sources functioning correctly and efficiently?	◯	◯		
	Is water storage and usage within expected limits? (provide %)	◯	◯		
Irrigation efficiency	Are irrigation systems, hoses etc free from leaks?	◯	◯		
	Has the irrigation plan / schedule been set for the week?	◯	◯		
Plant monitoring	Are plants routinely monitored for signs of water stress or overwatering?	◯	◯		
Equipment and infrastructure checks	Have check been undertaken for leaks and damage in all water infrastructure (pipes, hoses, taps?	◯	◯		
Worker practices	Are workers following procedures for irrigation and watering as trained?	◯	◯		
	Are issues followed up?	◯	◯		
Public education	Is up to date information on responsible water use available to customers and the public?	◯	◯		

Appendix 2: Stakeholders

Stakeholders and those who will use this Code of Practice include the following.

Stakeholder	Function and Interest
Local government	Responsible for Policy. Assessor of best practice fit. Usually responsible for giving effect to water restrictions under Council Bylaws. Sometimes also the supplier of water.
Water utility company	Implement policy, directly responsible for water management can Influence change with policy maker.
Industry body NZPPI	Provide leadership and governance oversight through the working group. Influence change with members, set up resources for best practice, govern implemented practices and advocate to decision makers.
Industry body working group	Development of best practices and behaviours.
NZPPI member nurseries in the food production chain	Recognition of food production nurseries as an essential service to the horticultural sector.
NZPPI plant producer members - revegetation, ornamental, amenity, forestry, food production and other nurseries	Directly impacted by water restrictions. Implementation, sharing and communicating best practice and behaviours both internally and externally.
NZPPI members - garden retailers	Directly impacted by water restrictions. Implementation, sharing and communicating best practice and behaviours both internally and externally.
Nursery and garden retail supply chain	Indirectly financially impacted by water restrictions. Make sure good supplies of "water saving" products. e.g. mulch, water timers ...
Nursery and garden retail customers	Seek cooperation and adoption of change.
Landscapers	Master Landscapers. Customers of many plant producers and directly impacted by water restrictions.
Horticultural training	Primary ITO.
Irrigation suppliers - Installation	Advance irrigation, Water force, Irrigation NZ, Advance irrigation.
Non-NZPPI member nurseries and garden retail	NZPPI consultation.
Communities	Other business that significantly impact water usage.
Media	Create awareness and co-promote to consumers.

Appendix 3: Sustainable Development Goals

The Sustainable Development Goals (SDGs) are governed by the United Nations and world leaders.

In 2015, this group agreed to uphold 17 goals for a better world by 2030. These goals have the power to end poverty, fight inequality and stop climate change. The SDGs are the blueprint to achieve a better and more sustainable future for all.

Countries and companies can align their plans and objectives to these international goals. To provide a self-check of our Code of practice, we have linked to five of the SDGs that directly align with and influence our plan and vision for sustainable water management in the plant production and garden retail industry.

SDG 6: Clean water and sanitation

Ensure availability and sustainable management of water and sanitation for all. Clean, accessible water for all is an essential part of the world we want to live in and there is enough fresh water on the planet to achieve this.

SDG11: Sustainable cities and communities

Making cities sustainable means creating career and business opportunities, safe and affordable housing, and building resilient societies and economies. It involves investment in public transport, creating green public spaces, and improving urban planning and management in participatory and inclusive ways.

SDG 13: Climate action

There is no country that isn't impacted by the effects of climate change. Greenhouse gas emissions are 50% higher than in 1990. Climate change is causing long-lasting changes in our climate system, which has irreversible consequences.

SDG 15: Life on land

Protect, restore and promote sustainable use of ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

SDG 17: Partnerships for the goals

A shared vision among multi-stakeholder partnerships and implementation of the goals for sustainable development. This goal binds the other goals together.

The Sustainable Development Goals Report 2023 | Department of Economic and Social Affairs (un.org)

Notes

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NEW ZEALAND PLANT PRODUCERS INCORPORATED

New Zealand Plant Producers Incorporated
Level 2, 23 Waring Taylor Street, Wellington
PO Box 3443 Wellington 6140
P: 04 918 3511
F: 04 499 9589
E: office@NZPPI.co.nz
W: www.NZPPI.co.nz