

ORCHARD WATER MANAGEMENT PLAN FORM

The purpose of this plan is to identify practices that mitigate environmental impacts of orchard activities (including water use) on water sources and the surrounding environment/ecosystems.

Management plan for: Konayuki / Makaira
3390 / 8000

KPIN/s:

WATER MANAGEMENT PLAN INSTRUCTIONS

- Review the set of water management actions listed in the table below
- Tick (✓) any that *you are already doing*. Circle or highlight any specific aspects that apply to your KPIN(s)
- Cross (x) any that *you are not doing* or are *not relevant* for your KPIN(s)
- Tick (✓) in the CI column any actions that you may plan to do or have identified as an opportunity for improvement in the future
- Add any additional actions relevant to your KPIN(s) in the blank action rows
- In the comments column, add action notes and/or details for transfer to the Continuous Improvement Plan. This column can also be used to explain KPIN variations

Note: Items marked * are specific Zespri GAP Principal Levels; Major or Minor

CONTINUOUS IMPROVEMENT PLAN REMINDER: Tick in the CI column any actions that you may plan to do or have identified as an opportunity for improvement. Move only action(s) you intend to act on in the next 1-3 years to your continuous improvement plan form (The continuous Improvement plan is in Part B: Section 1.6 of the Grower Manual).

Operating Context (Optional)	CI ✓
<p>Note here any known environmental water quality concerns or community/collaborative catchment management projects in vicinity of these KPINS*</p> <p style="margin-top: 20px;">Konayuki - private water scheme</p>	

Strategy	Action	✓ / X	Comments	CI Continuous Improvement ✓
Water management plan	Develop and implement a water management plan that identifies practices to mitigate environmental issues associated with use of water and on water (as per this template) *	✓		
Water quality - ensuring the quality of the water source				
Identify and control sources of water applied to orchard	Develop a site map to show all water sources and all permanent fixtures, including wells, gates, reservoirs, returns and other above ground features *	✓		
Select appropriate water sources for the task	Do not use high risk water for irrigation, frost protection or spray applications *	✓		
	Test water supply regularly as per water testing procedures. Cease use if test indicates contamination *	✓		
	Never use chemically contaminated water	✓		
Ensure trucks delivering water are clean	Check on previous contents of trucks delivering water	✓		
Monitor water condition after drought or flood	Control water usage in relation to drought (concentrates contaminants), or flood (washes contaminants in).	✓		

Strategy	Action	✓ / X	Comments	CI Continuous Improvement ✓
Good system design & maintenance	Where possible, water storage facilities are covered and have appropriate filter and treatment systems if/where needed.	✓		
	Check and maintain good design of water storage and transport system in the orchard.	✓		
Ensure water used for plant protection products is pure	Some chemicals react with soil and other contaminants in the water. Always check labels for specifications.	✓		
Water contamination prevention - to prevent orchard activities contaminating waterways				
Ensure no chemical leakage from any stores or machinery on site	Secure agrichemicals and other potential contaminants away from flood-prone areas, no leaking into waterways *	✓		
	Equipment maintenance procedure as per GAP requirements *	✓		
Design mixing and handling areas so no contamination	Develop effective spillage control in chemical/ fertiliser/fuel handling areas *	✓		

Strategy	Action	✓ / X	Comments	CI Continuous Improvement ✓
Monitor transport systems	Ensure no spillage of chemicals/fertilisers etc. while in transport *	✓		
Control animal access to water areas	Both domestic and wild animal faecal matter contaminates the water with bacteria, debris, and other diseases. Also damages physical environment. Restrict animal access (e.g., grazing stock) to critical source and riparian areas	✓		
	Fence off waterways	✓		
Control timing of watering	Do not water too soon or too much after fertiliser, compost or chemical applications that could contaminate water (e.g., via leaching or run-off)	✓		
Prevent run-off	Sediment can hold bacteria and chemicals that may contaminate the water and damage the environment	✓		
	Minimise erosion * and prevent water runoff in order to conserve water for the orchard and eliminate contamination of waterways. See good practice	✓		
	Vegetation around open water sources See good practice.	✓		
	Controls in place to capture and treat or safely dispose of wash water as per Waste and Pollution Management Plan *	✓		

Strategy	Action	✓ / X	Comments	CI Continuous Improvement ✓
Follow best practice spray application	Spray as per rules of CPS including only in appropriate conditions, with appropriate equipment and qualified applicators *	✓		
Protect and maintain water use structures	Install and maintain protection around vulnerable pipework and infrastructure	✓		
	Clearly mark/identify vulnerable structures and regularly brief/remind orchard workers and contractors to avoid damage	✓		
	Check condition of water use structures regularly. Repair and replace system components when needed	✓		
	Maintenance and cleaning of bore system(s) to prevent ground water contamination from seeping into it	✓		
Follow good practice fertiliser management	Follow the Four R's of fertiliser use to avoid excess fertiliser use (right rate, type, place and time) See good practice	✓		
	Rationalise fertiliser use based on crop need and orchard properties including soil type and vine age *	✓		
	Avoid fertiliser application ahead of heavy rainfall	✓		
Care with compost	Apply compost as soon as possible after receiving but avoid application ahead of heavy rainfall	✓		

Strategy	Action	✓ / X	Comments	CI Continuous Improvement ✓
	If unable to spread immediately, store compost away from water run-off areas and cover ahead of significant rainfall (to prevent leaching from the compost)	✓		
Fertigation management	Avoid fertigating saturated soils or ahead of significant rainfall	✓		
	Ensure system is designed in a way to avoid the over delivery of nutrients	✓		
	Ensure system has a means of preventing the backflow of chemicals into the water source	✓		
Maintain/improve soil health	Ensure good soil structure to retain water and nutrients * See good practice	✓		
Safe sewage storage or distribution *	Monitor condition of sewerage or distribution systems	✓	septic - emptied when required	
	Ensure toilets comply with regulatory/ council requirements See BOP regulations	✓		

Strategy	Action	✓ / X	Comments	CI Continuous Improvement ✓
Water use control - to conserve water / minimise wastage *				
Calculate water requirements/	Calculate water requirements for crop based on evapotranspiration (ET) rates and canopy cover * See good practice	✗	No irrigation	
Obtain water use permits as required	Keep record of process to obtain permits as required. Keep a copy of the permit on file *	✓		
Monitoring water use	Measure/monitor the amount of water used in the orchard from each water source in accordance with regulatory requirements, and ideally through use of telemetered water meter(s). Manual meter readings (ideally weekly, minimum monthly) or pump records could be used as an alternative data source. Include spray mix, irrigation, frost protection, cleaning *	✓		
Keep records of water use	Include date, cycle duration, actual or estimated flow rate per hour, and the volume updated on at least a monthly basis*	✗	No irrigation	
Keep records of rainfall	Use an on-site or nearby weather station/rain gauge to gather data for informing irrigation on/off decisions and/or water budget*	✓	weather station at konayuki utilise local weather stations on neighbouring orchards for makaira	

Strategy	Action	✓ / X	Comments	CI Continuous Improvement ✓
Comply with permitted activity and water consent requirements	Ensure compliance with water use regulations and consent requirements*	✓		
Water budget	Create a water budget for the orchard that balances crop needs with rainfall or irrigation inputs (ideally weekly) and if required, schedule irrigation *	✗	No irrigation	
Monitor soil moisture	In conjunction with orchard observations and/or instead of a water budget, use a correctly installed and accurately interpreted soil moisture monitoring system to inform irrigation on/off decisions * See good practice	✗	No irrigation	
Irrigation system	Design/install efficient irrigation and/or frost system. See good practice		No irrigation	
	Where possible, use covered water storage systems to minimise evaporation losses.			
	Install and maintain protection around vulnerable pipework and infrastructure.			
	Clearly mark/identify vulnerable structures and regularly brief/remind orchard workers and contractors to avoid damage.			
	Check the irrigation system. Repair leaks, clean filters and clear line blocks. See good practice			


Strategy	Action	✓ / X	Comments	CI Continuous Improvement ✓
Schedule irrigation/ frost protection for minimum wasted	Time for minimum wind, evaporation loss.		No irrigation / frost protection fan only	
	Tailor irrigation application rate, depth and frequency to soil type/infiltration rate.			
	Don't apply irrigation when soil at or above field capacity and significant rainfall imminent.			
	Reconsider irrigation auto-settings daily.			
	Ensure frost system thermometer is calibrated and on/off settings adjusted correctly.			
Train staff on effective use and maintenance of the irrigation system	Ensure all staff using the irrigation system know how to use and maintain it effectively *		No irrigation	
Store water in times of maximum availability*	Store water in legally authorised, good condition storage systems if required. See good practice	✓		
	Collect and recycle water e.g., from roof *	✓		
Soil water-holding capacity	Understand/measure and consistently improve the soil water-holding capacity if required * See good practice .			

Strategy	Action	✓ / X	Comments	CI Continuous Improvement ✓
Environmental water conservation - includes protection of mahinga kai (edible species) and wildlife/habitat				
Follow all water quality requirements	Water quality processes also ensures minimal environmental damage.	✓		
Follow all water use requirements	Minimal drawing of water ensures minimal impact on the water environment.	✓		
Select water source	As much as possible, choose a water source with the least environmental impact.	✓		
Plant and protect appropriate vegetation	Plant and protect appropriate vegetation to shade/cool water, support water ecology and prevent erosion of soil * See good practice	✓		

Strategy	Action	✓ / X	Comments	CI Continuous Improvement ✓
	Ensure earthworks or other works near waterways (including wetlands), complies with regulatory requirements.	✓		
Prevent over-watering	Prevents leaching of soil as well as wastage.	✓		
Protect/maintain water intake structures/screens	Ensure intake structures and fish screens comply with regulatory/council guidelines to avoid fish/eels entering water use system* See regulations	✓		
	Install and maintain protection around water intake screens to avoid damage to fish screens*	✓		
	Regularly check and maintain intake structures *	✓		
Good culvert design & maintenance	Ensure culvert and drain design/install complies with regulatory/council guidelines and enables fish passage * See regulations	✓		
	Regularly check and maintain culverts and drains in good repair to maintain fish passage and avoid sediment release to waterways * See regulations	✓		

Strategy	Action	✓ / X	Comments	CI Continuous Improvement ✓
<i>Other</i>				

Review:

Date: 30/10/202	Sign: 	Date:	Sign:
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