



Produce Safety Rule:

Regulación y Buenas Prácticas Agrícolas

Webinar 5

Good Practices in agricultural water of production: experience of Chile

Ricardo Adonis.
ASOEX – FDF. Chile.

June 15, 2021



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1.- Introduction

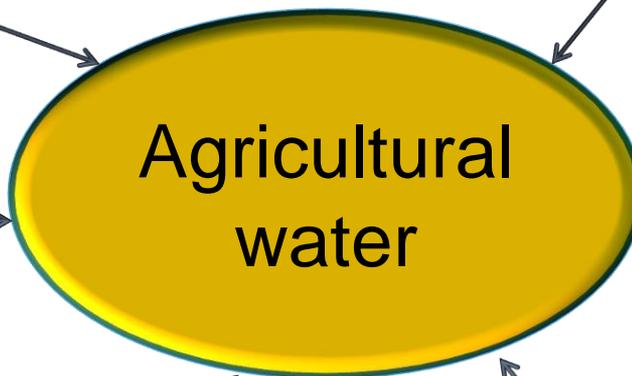
- Human pathogenic microorganisms can be present in water.
- They can be transmitted and transferred through the water.
- Water is often not under the farmer's control.
- Infected water can contaminate produce during farming activities.
- Contamination can affect the entire harvest.

2 Definition of agricultural water

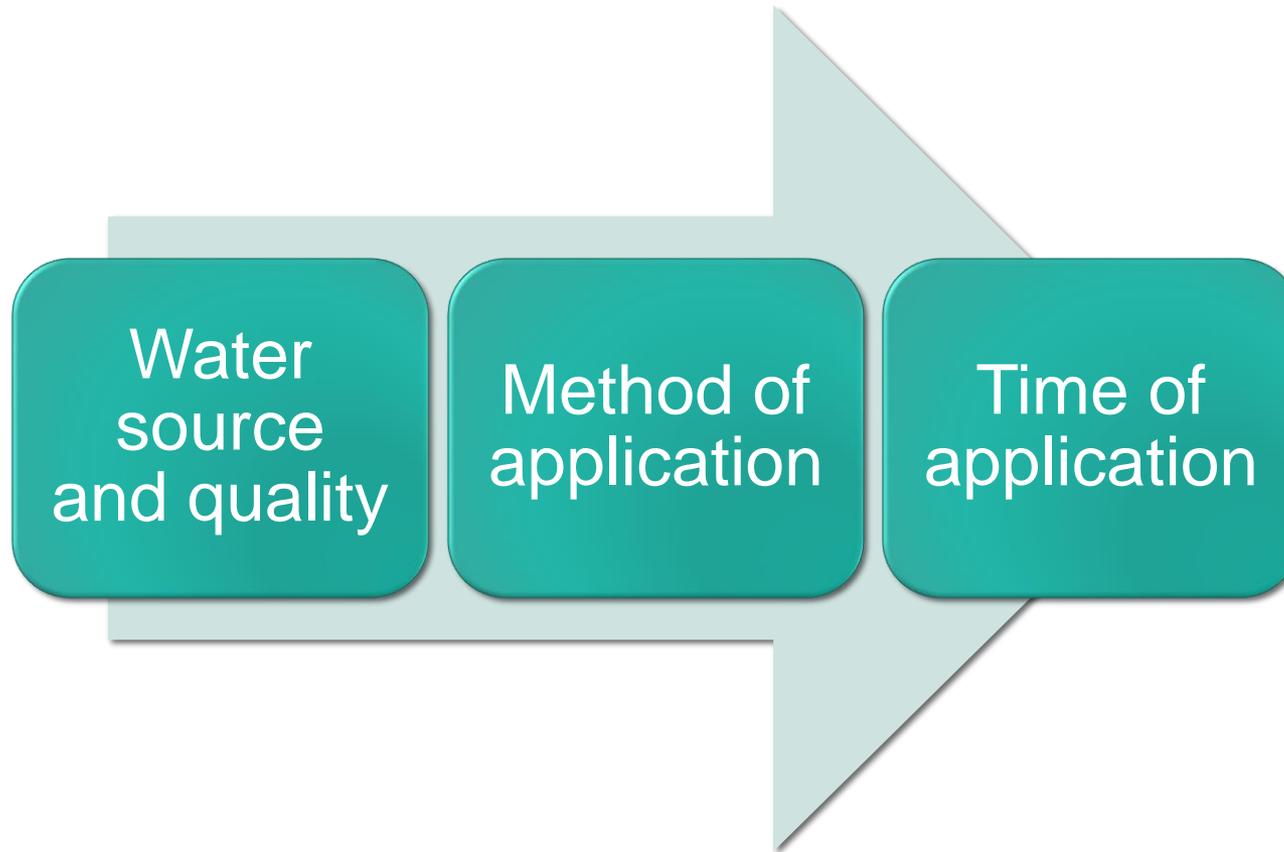
Agricultural Water*

Water used in covered activities on covered produce where water is intended to, or is likely to, contact covered produce or food contact surfaces, including water used in growing activities (including irrigation water applied using direct water application methods, water used for preparing crop sprays, and water used for growing sprouts) and in harvesting, packing, and holding activities (including water used for washing or cooling harvested produce and water used for preventing dehydration of covered produce).

What is agricultural water? Examples from Chile



3.- Three main risk factors for agricultural water:



3.- Three main risk factors for agricultural water:

The three main risk factors related to agricultural water are the following:

1. Water source and quality.

- Public water supply: lower risk but higher cost and not always a viable option
- Groundwater for contact with fruit
- Surface water: if used in contact with produce, it's likely to require treatment (based on analyses). In general, it represents a higher risk
- The above determines the frequency of analysis

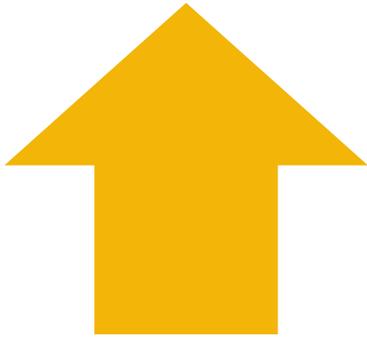
2. Method of application.

- Water that makes contact with the harvestable portion of a crop. In Chile, that includes from fruit set to ripening in the case of fruit (30 to 45 days pre-harvest).
- ~~• Water that does not make contact with the harvestable portion of a crop.~~

3. Time of application.

- The risk is higher as harvest approaches; infrequent in the case of fruit—only in the event of unusual climate events.

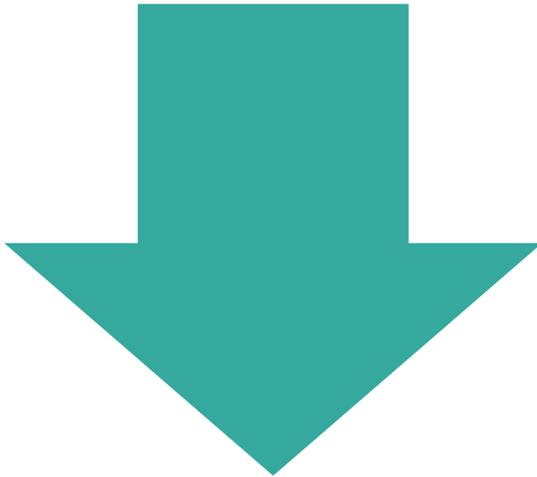
3.1 Source and quality:



HIGHER RISK:

Surface water, including:

- Water conveyed by canals or stored in reservoirs
- Underground water from closed wells stored in open ponds
- Water from open underground sources (watersheds)
- Harvested rainwater



LOWER RISK:

- Public water supply (assuming the system is in good condition)

- Underground water, including water from closed wells that is kept enclosed up to the point of use

3.1 Source and quality: Good practices for mitigating risk in the public water supply

Ensure the system is free of risks, including:

- Possibility of back-siphonage (backflow valve)
- Improper connections
- Risks of contamination

Note: If the public water supply is stored in open ponds, it is considered surface water.

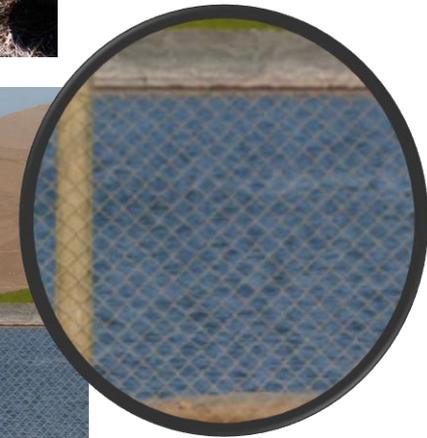


3.1 Source and quality: Good practices for mitigating risk in surface water

- Water conveyed by canals



- Water stored in reservoirs.



- Underground water from closed wells stored in open ponds
- Harvested rainwater



3.2. Method of application of water

Water in contact with produce or food-contact surfaces.

Risk depends on the crop species and agricultural practices.

Factors to consider when assessing method of application-related risks:

Will the water contact produce?	During what activity does the water contact produce?	When does the water contact the plant or contact surfaces?
No:	--	--
Yes.	<ul style="list-style-type: none"> -Irrigation by aspiration → -Product sprays → -Frost protection → -Temperature control → -Washing, etc. → 	<p>Does it contact the produce? System status</p> <p>Timing: winter applications vs. closer to harvest</p> <p>Does it make contact when there is fruit?</p> <p>Is there sanitary water management?</p>

3.3.- Time of application or use of water

Time of application. Why is it important?

For timely microbiological analyses.

What type of water to use and when to sample?

a) The water to be analyzed is representative of use

b) The sample be taken as close to harvest as possible

Other good practices



Water tanks located at a distance. Enclosed and locked.

A) AGUA DE BEBIDA

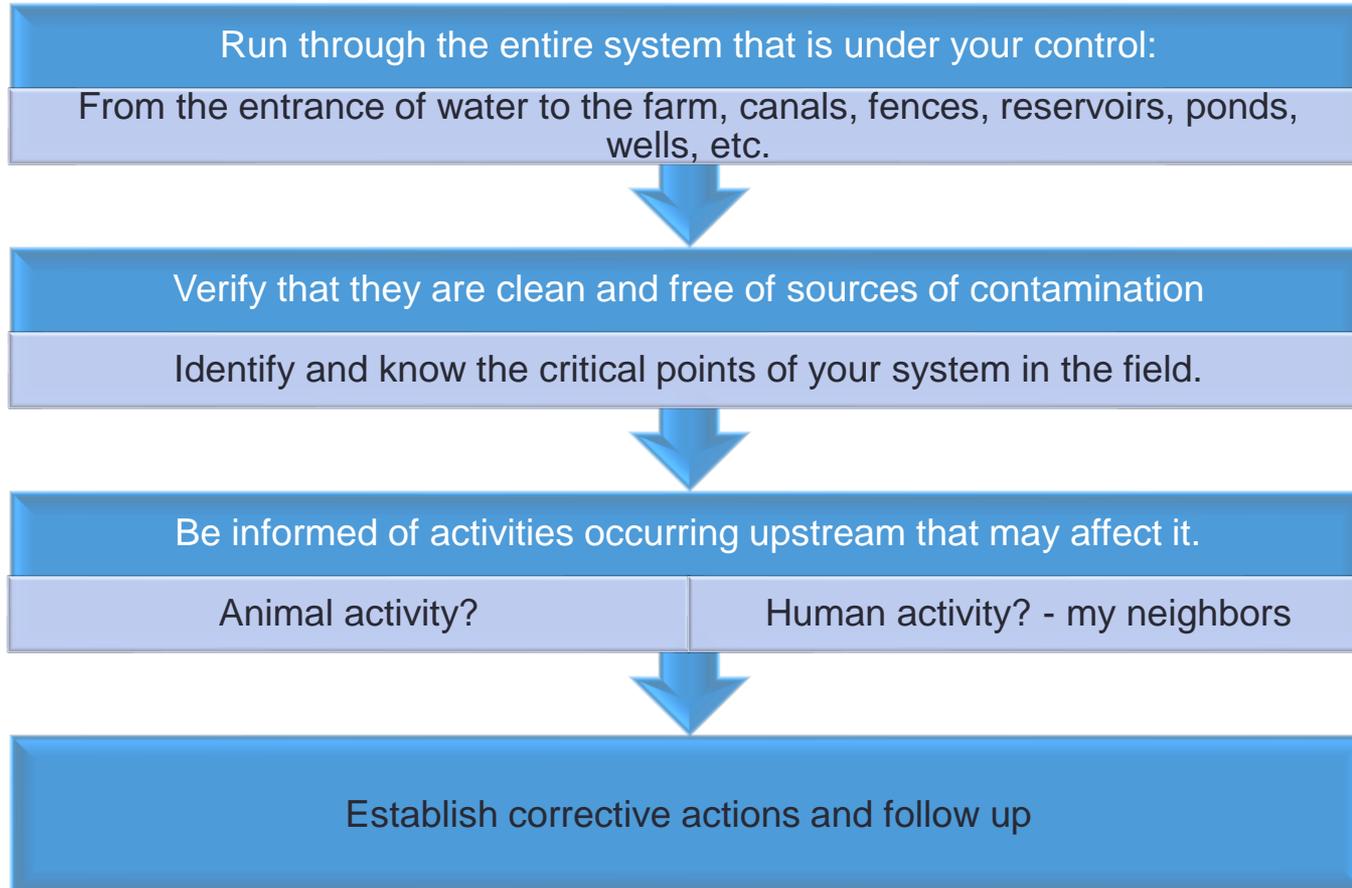
- En los campos se construyeron centros para:
 - Lavado de bidones (diario).
 - Agua proveniente de APR o sistemas de potabilización propios.
 - Carga de bidones con agua filtrada a través de máquina AMAWA.
 - Distribución de bidones con agua a todas las áreas operativas de los campos.
 - Agua con muestreo microbiológico.



Drinking water for humans

4.- Inspection of water sources

It is a Good Practice to inspect the entirety of the water system(s) at least once a year



4.1. Things to consider when inspecting surface water systems



Cleanliness of canals and water intake systems



Condition of protective barriers

Some examples of possible contamination factors to consider include:

- Overall condition of canals and reservoirs
- Cleanliness: accumulation of trash or manure
- Protection against animals
- Protection in residential areas or from septic tanks
- Possibility of flooding
- Proximity to animal breeding or grazing sites
- Possible contamination from use (such as the application of manure)

4.1. Things to consider when inspecting underground water systems



Cover and protection of underground water systems, accumulation systems, etc

Some examples of possible contamination factors to consider include:

Overall condition

Wells in close proximity to:

- Flood areas
- Septic tanks
- Accumulation of manure
- Animal breeding or grazing sites

5.- Water treatment

Water treatment should be done using products authorized locally or by the EPA for use on food-contact surfaces.

Important things to consider:

- Where the disinfectant is added and its resistance time
- Read the supplier's label
- How will the treatment be controlled (quantity of disinfectant, concentration, etc.)
- Keep records to verify that the water is treated appropriately

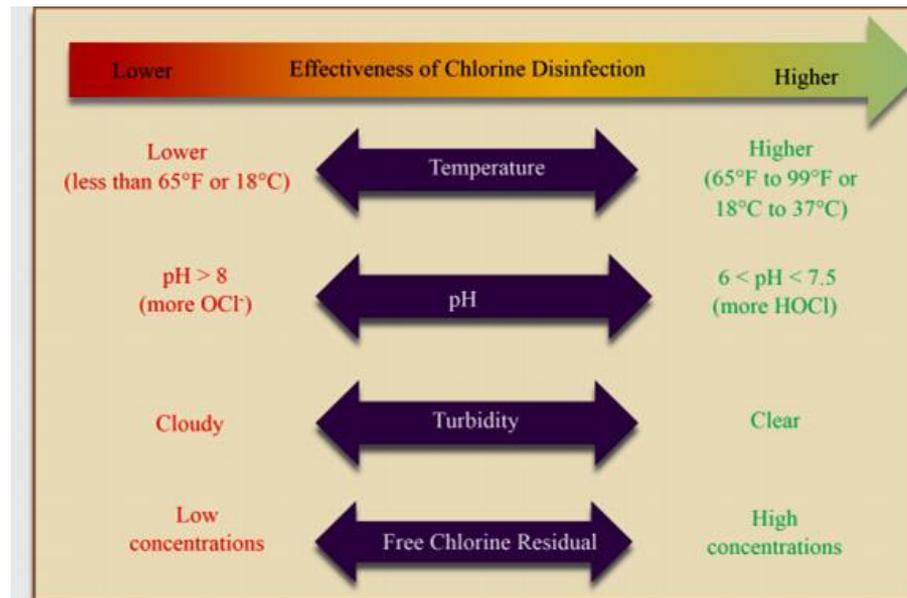


Figure 4. Factors that influence chlorine efficacy.

University of Arizona : Dery, Jessica:
Minimizing Risks: Use of Surface
Water in Pre-Harvest Agricultural
Irrigation; Part II: Sodium and Calcium
Hypochlorite (Chlorine) Treatment
Methods

Water treatment: Surface water example



Decanter tanks

Quartz sand filter

Water with no turbidity

Disinfectant added

6.- Review of analyses

- Informe Resultados N°.

1 de 1

Lab.: MICROBIOLOGIA

Este Informe consta de 1 muestra(s)

RUT del Cliente : 7

Este Informe fue emitido el 13 de oct de 2015 a las 10:58:03 am

Original: Cliente

Identificación del Cliente

Nombre : *[Faint text]*
 Atención : *[Faint text]*
 Dirección : *[Faint text]*
 Ciudad : *[Faint text]* Comuna : *[Faint text]*
 Teléfono : *[Faint text]* Fax : *[Faint text]*

Datos de la Solicitud

Condición de Pago : *CONTRA FACTURA*
 Plazo de Entrega : *15-10-2015*

Muestra :

Clave : *AGUA APLICACION CASETA PARCELA 1*
 Tipo : *AGUA*
 Subtipo : *DE APLICACION*
 Muestreado por : *EL CLIENTE* Fecha de Muestreo : *NO INDICA*

ANALISIS SOLICITADOS:

COLIFORMES TOTALES
COLIFORMES FECALES
ESCHERICHIA COLI

RESULTADOS

300 NMP/100 ml
240 NMP/100 ml
240 NMP/100 ml

FECHA DE RECEPCION DE MUESTRA: 07/10/2015 HORA: 12:55

FECHA DE INICIO ANALISIS: 07/10/2015 HORA: 17:30

FECHA DE TERMINO ANALISIS: 11/10/2015 HORA: 14:45

Observaciones:

NMP/100 ml: Número más probable por 100 ml.

Método:

Determinación de Coliformes Totales, Fecales y E. coli. Método del Número más Probable: Standard Meth

Producers should know how to read the certificate of analysis issued by the lab.

- What it means
- What to look for

7.- Documentation

- Recommended records:
 - Water system inspection findings: date, findings, corrective actions
 - Water analysis results
 - Corrective actions taken, if any
 - Monitoring of water treatment
 - Scientific data and information to support treatment, calculations, and analysis

Summary

Water that contacts produce or food-contact surfaces is one of the main risks to food safety given the ability of water to transport microorganisms.

The farmer must take measures to prevent safety hazards derived from the water under his control, for which the farmer must take into account several considerations, among others:

What type of water do I have? Do I use municipal, ground or surface water?	✓.
How do I use it?	✓.
Have you analyzed all the possibilities of water contact with the product?	✓.
At what stage of the crop does water contact occur?	✓.
Can I disinfect the water?	✓.
What evidence do I have that disinfection is adequate?	✓.
How carefully are you checking and maintaining the sanitation of your water systems?	✓.
Are the water systems well maintained to avoid water contamination?	✓.
Is there activity nearby that could contaminate the water?	✓.
Does the farm keep detailed records and are they checked daily?	✓.



Thank you very much