AGRI LINK | EMPOWERING SUSTAINABLE GROWTH

Jan van der Wolf / Pexels

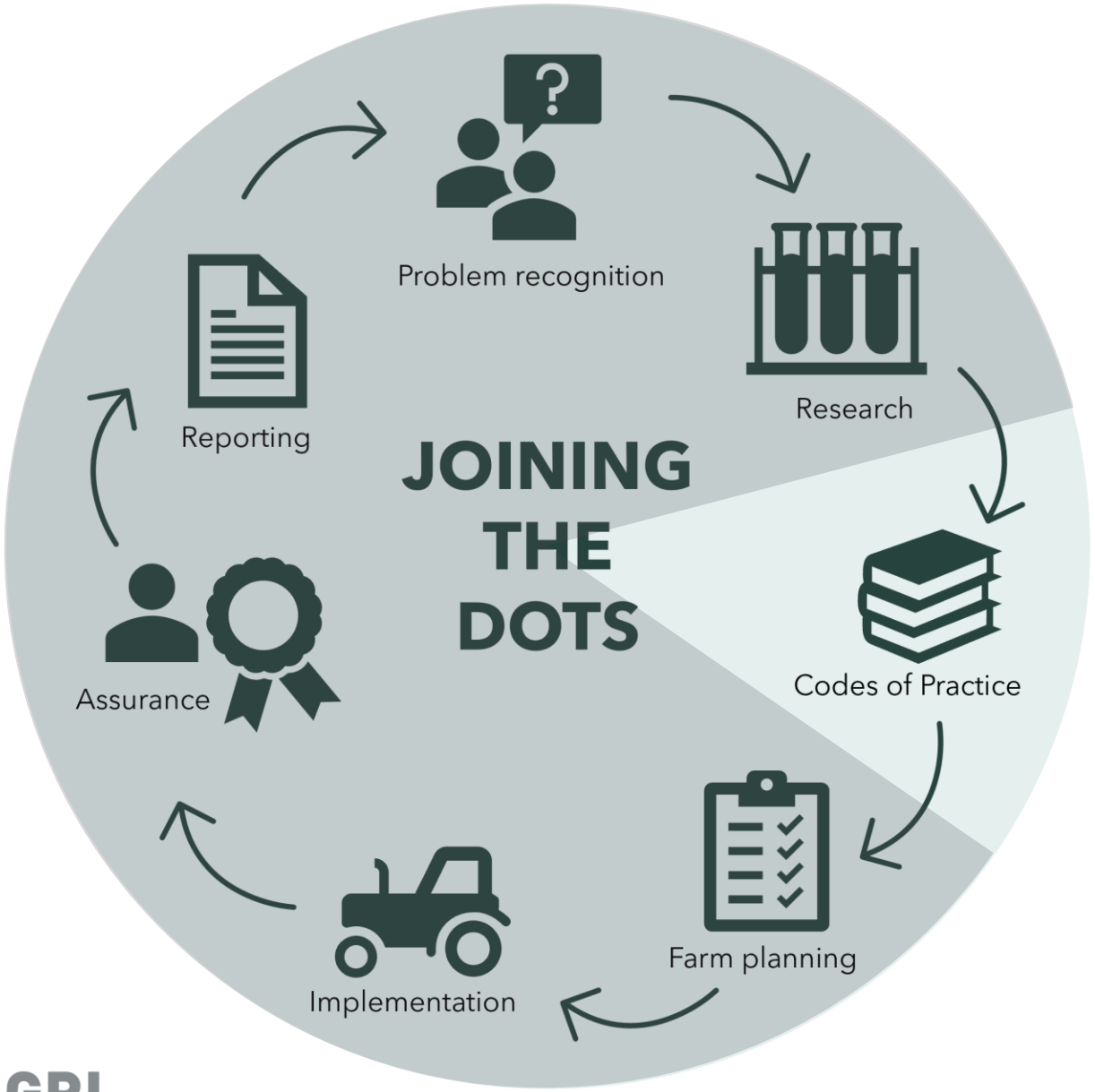
Making every drop count: Practical land application of drain nutrient solution

Andrew Barber | Covered Cropping Mini Conference 2026

Overview

Updated industry Codes of Practice

- Designed specifically for horticulture
- Refreshed after 10+ years (19 years for covered cropping!)
- Part of an integrated solution:
  - Codes of Practice
  - NZGAP EMS v2
  - Confidence for growers and regulators
- There is an opportunity to fill a vacuum: Who will fill it?


Problem recognition
Research
Codes of Practice
Farm planning
Implementation
Assurance
Reporting
JOINING THE DOTS

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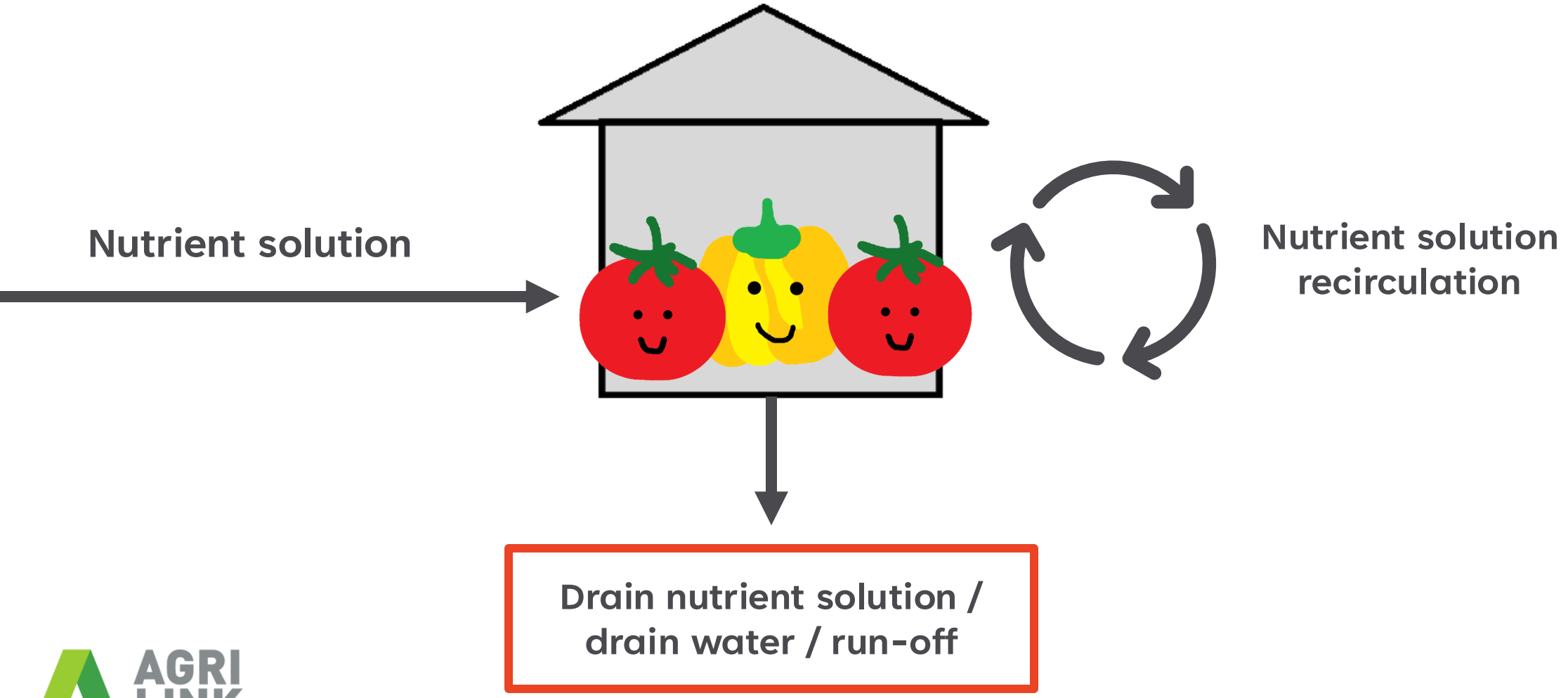
Drain nutrient solution



Why manage drain solution?

- Recover nutrients and maximise resource use
- Meet changing regulatory expectations
- Reduce nutrient losses to the environment
- Improve resource use efficiency

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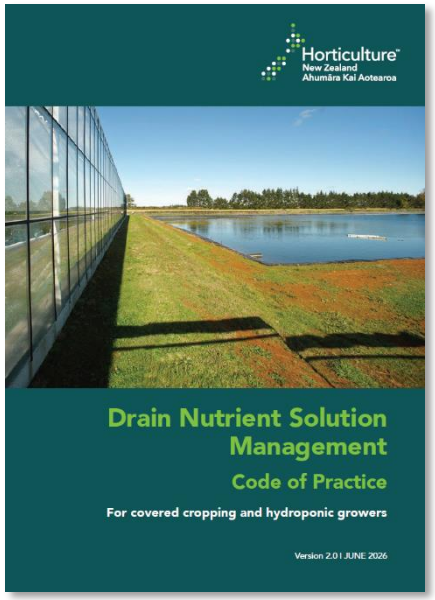
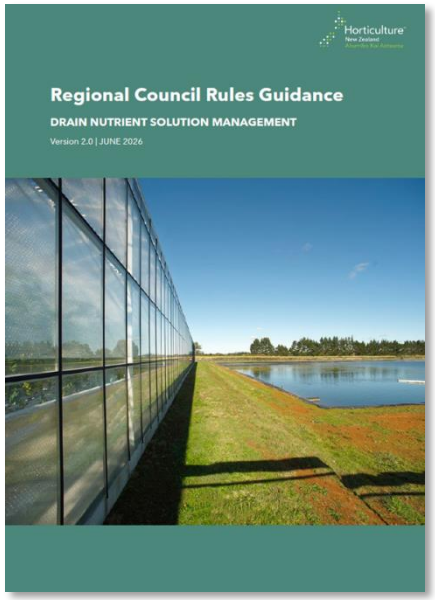
The industry solution for your solution



Code of Practice



Regional rules guidance

Drain Solution Management Plan Excel workbook

Management hierarchy

(Page 6 of the Code of Practice)

Eliminate

- Eliminate the production of drain nutrient solution in your operation

Minimise

- Minimise the volume of drain solution generated
- Practices include water filtration/treatment, high purity fertilisers, staff training, maintenance programme

Manage

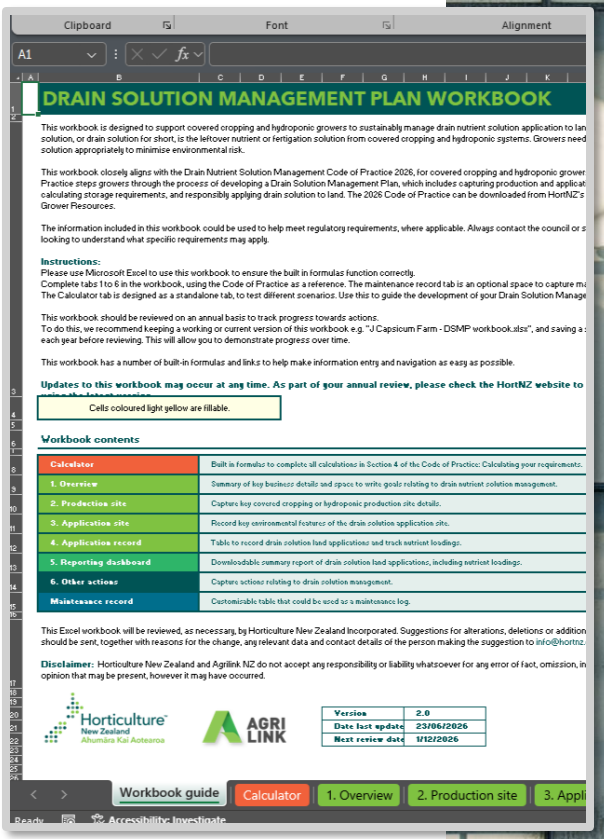
- Manage your drain solution through responsible application to land, avoiding application to surface or ground water
- Develop and maintain a drain solution management plan

Putting the Code *into* Practice

Developing a Drain Solution Management Plan (DSMP)

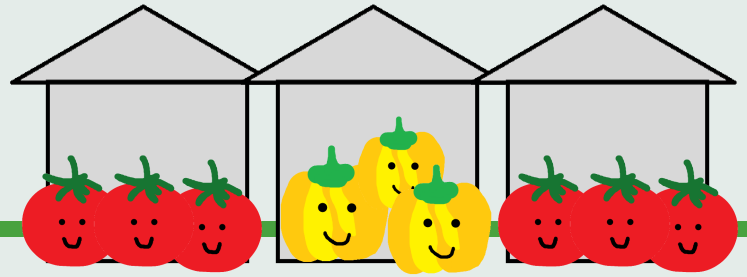
What does a DSMP include?

1. Overview of growing operation and production site
2. Description of drain solution application site
3. Nutrient loss risk factors for the application site and mitigations
4. Land application:
   - Pre-application checks
   - Records of volumes and nutrient loads (nitrogen, phosphorus)

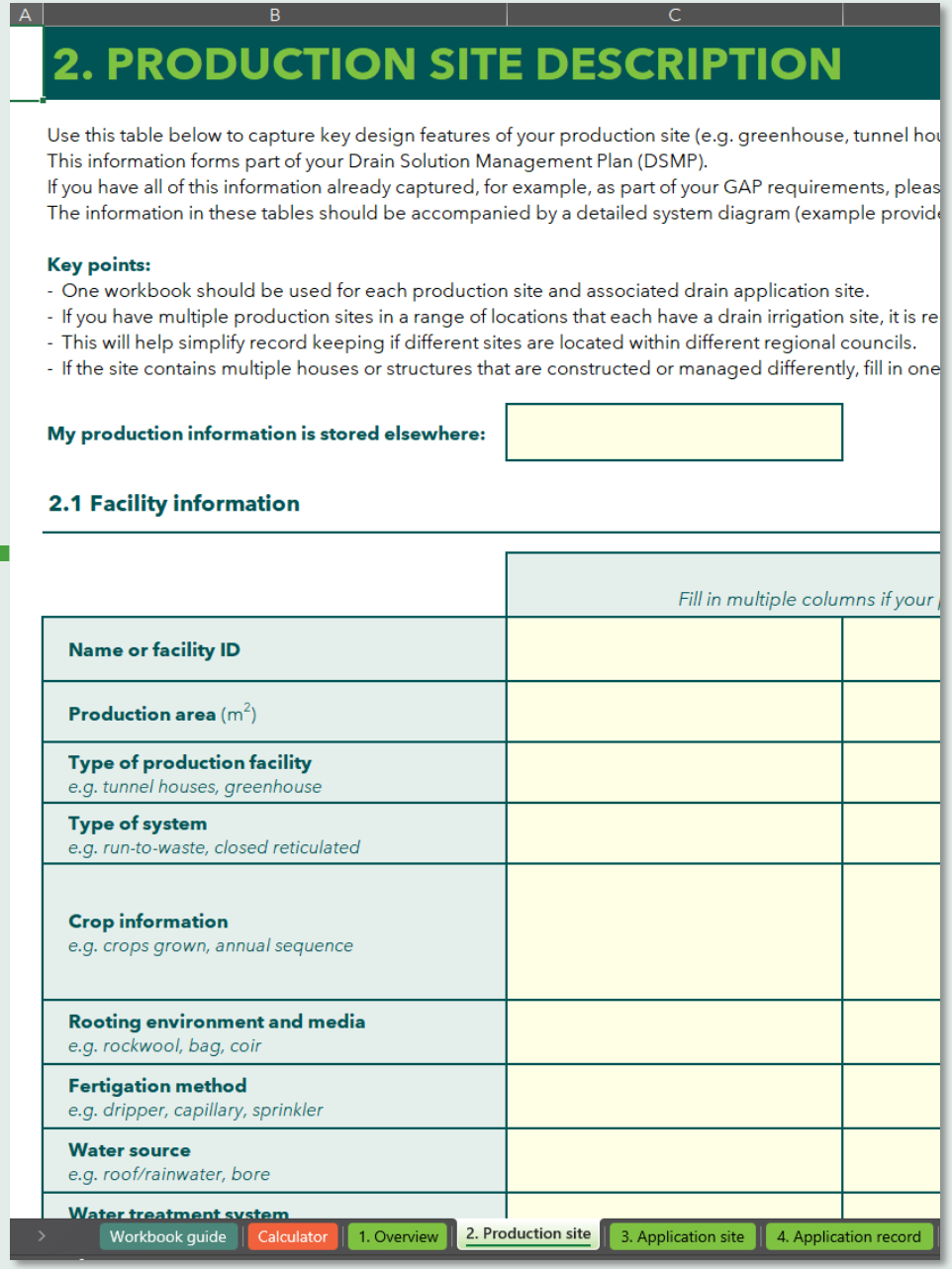


DSMP Excel workbook

1. Growing operation



- Tomatoes and capsicums across 3 structures
- 5 hectares in total
- 3.5 m^3/day of drain solution collected from the production site needing further management
- 400 ppm total nitrogen / 100 ppm total phosphorus
- Outdoor pond storage



A B C

2. PRODUCTION SITE DESCRIPTION

Use this table below to capture key design features of your production site (e.g. greenhouse, tunnel hou
This information forms part of your Drain Solution Management Plan (DSMP).
If you have all of this information already captured, for example, as part of your GAP requirements, pleas
The information in these tables should be accompanied by a detailed system diagram (example provid

Key points:
- One workbook should be used for each production site and associated drain application site.
- If you have multiple production sites in a range of locations that each have a drain irrigation site, it is re
- This will help simplify record keeping if different sites are located within different regional councils.
- If the site contains multiple houses or structures that are constructed or managed differently, fill in one

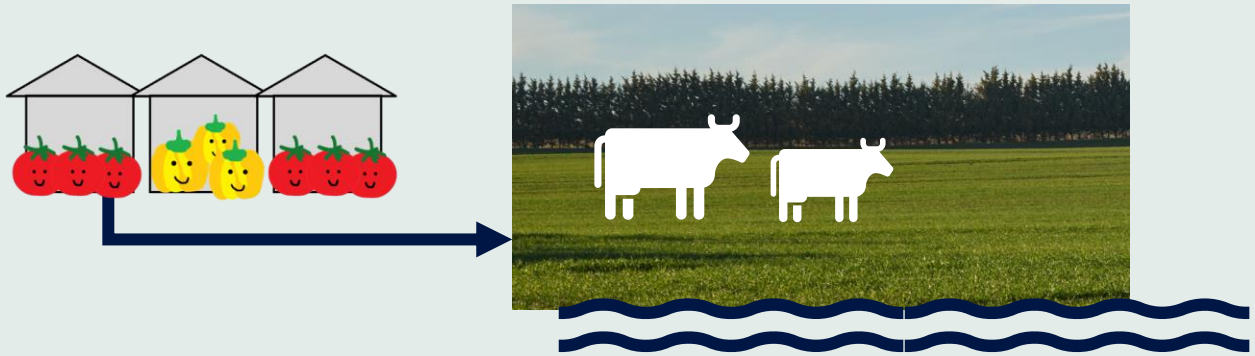
My production information is stored elsewhere:

2.1 Facility information

	Fill in multiple columns if your	
Name or facility ID		
Production area (m^2)		
Type of production facility *e.g. tunnel houses, greenhouse*		
Type of system *e.g. run-to-waste, closed reticulated*		
Crop information *e.g. crops grown, annual sequence*		
Rooting environment and media *e.g. rockwool, bag, coir*		
Fertigation method *e.g. dripper, capillary, sprinkler*		
Water source *e.g. roof/rainwater, bore*		
Water treatment system		

Workbook guide | Calculator | 1. Overview | 2. Production site | 3. Application site | 4. Application record

2. Application site



- Flat paddocks next to glasshouses
- 4 hectares in total
- Mix of grass silage and cattle grazing
- Nearby stream
- Clay loam soil, moderate to high soil profile available water

(Section 3 of the Code of Practice)

3. APPLICATION SITE DESCRIPTION

Each drain solution application site needs to be assessed for suitability to apply drain nutrient solution. Many factors contribute to
Sites with features that may increase that risk e.g. highly free-draining soils, steep slopes, may be unsuitable for drain solution appli

Instructions:
Use the tables below to capture key information about your application site that is used to apply drain solution from your producti
The site information will inform what risk factors are present on your site, which need to be managed to reduce the risk of nutrient
Use the guidance in Section 2: Nutrient loss risk factors in the Drain Nutrient Solution Management Code of Practice.

If the application site is split into several blocks or paddocks, list all blocks, along with their areas, soil type, and ground cover in the
Even if you only have one block, enter this into the top row, as the Block ID and Area columns are linked to the application record t

The information in these tables should be accompanied by property maps, which contain the following information:
- Application site block boundaries
- Terrain
- Soil type
- Waterbodies, incl. lakes, streams, rivers, drains
- Other information that may be required by applicable regional council rules (e.g. distances from bores)

I have maps of the application site(s) available:	

3.1 Drain solution application site overview

Address	
Total application site area (ha)	0.0
Property description & land use *e.g. owner/occupier, leased for dairy*	
Delivery system for drain solution application *e.g. set sprinklers, moveable sprinklers*	

3.2 Biophysical features

Annual rainfall (mm)	
Soil profile available water [PAW] (mm)	
Description of topography *e.g. gently rolling*	
Site soil description *e.g. heavy clay, some blocks with lighter soils*	

3.3 Environment and freshwater

Description of nearby freshwater and	

3. Nutrient loss risk factors

What nutrient loss risk factors need to be managed on the site?

Risk factor	Mitigation
Flat topography increases risk of ponding.	Reduce application rates to allow solution to infiltrate soil.
Additional nutrients supplied by cattle increases risk of nutrient loss.	Use of a nutrient budget to match supply with crop demand.
Stream nearby increases risk of nutrient loss to surface water.	Plant a riparian strip between stream and application site.

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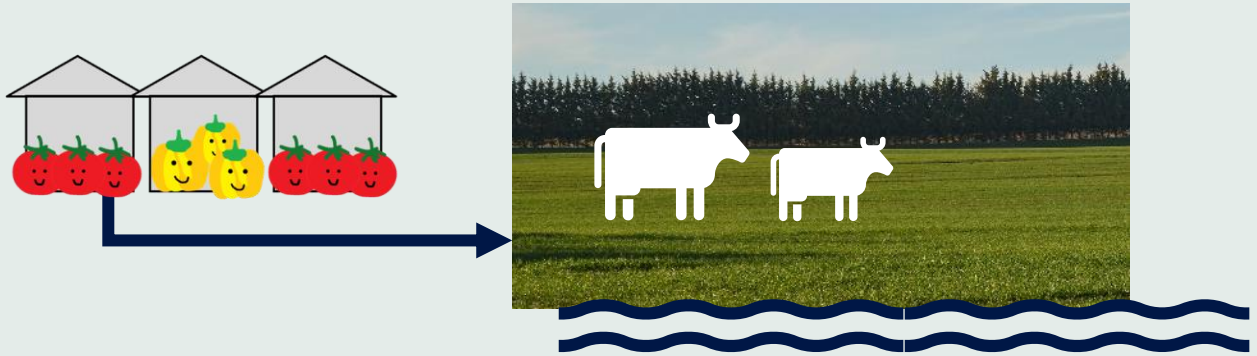
(Section 2 of the Code of Practice)

4. Land application

Pre-application check



	GO	NO-GO
Are weather conditions suitable for land application today and later this week?	Yes	No
Do soil moisture levels indicate irrigation demand?	Yes	No
Does my crop growth indicate a demand for nutrients?	Yes	No
Will this land application comply with consent conditions or permitted activity rules that apply to my operation?	Yes	No
Is the delivery or irrigation system set up to apply the volume of drain solution planned to the application site?	Yes	No

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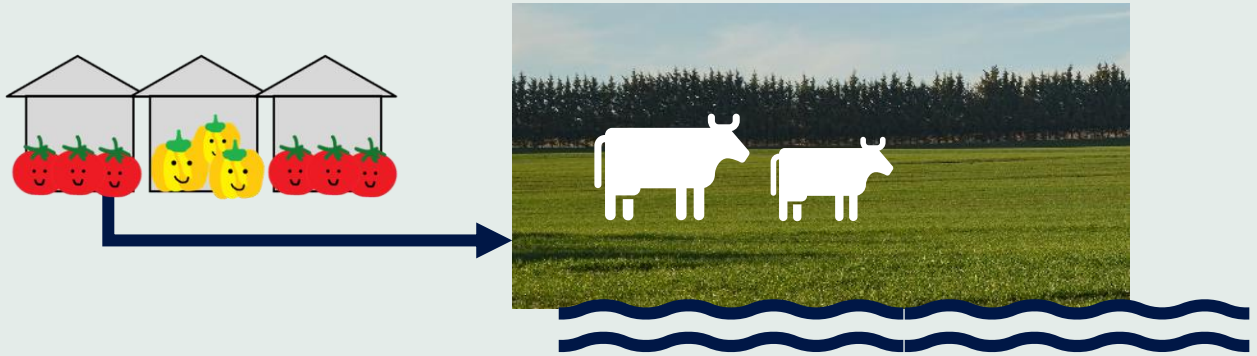
(Section 5 of the Code of Practice)

4. Land application

Application & record keeping



- Follow land application criteria set out in the Code of Practice (Section 5.2). These include:
  - There is an actively growing crop on application site
  - No run-off or ponding
  - Avoid applying to waterways and other environmentally sensitive areas
  - Nutrients supplied via solution match demand
- Keep good records using the Excel workbook

(Section 5 of the Code of Practice)

4. DRAIN SOLUTION APPLICATION RECORD

Use this tab to record drain solution applications on your site captured in tab 3. Application site.
These records feed into the 'Reporting dashboard' tab, where all drain solution applications can be summarised.

Instructions:

1. Enter data into the light yellow cells. Block ID and application area are linked to the Block table in tab 3. Application site.
2. When 'drain solution available to apply' is entered, the application depth is automatically calculated.
3. Ensure you have completed a pre-application check before all drain solution applications (see Section 5.1 in the Code).
4. Keep this application record sheet up-to-date, to then use the reporting dashboard to summarise your drain solution applications and track nutrient load.

There is space to add up to 300 applications.

No.	Date	Block ID	Application area (ha)	Drain solution available to apply (m^3)	Application depth (mm)	Current land use and ground cover *e.g. stock on permanent pasture*	Have you conducted a pre-application check? *(Section 5.1 in the COP)*	Soil
1								
2								
3								
4								

Other Excel workbook features

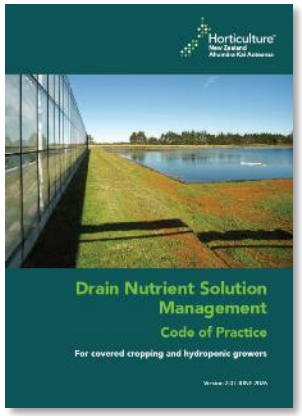
- Reporting dashboard to track nutrient loadings over the site
- Calculator tab to carry out Code of Practice calculations:
  - Drain solution rate calculator
  - Estimated nutrient loadings
  - Storage calculations

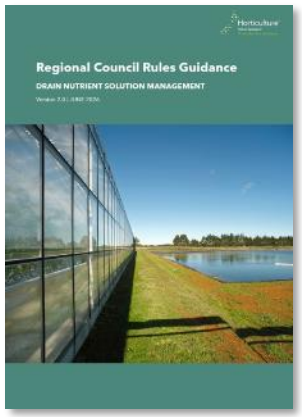
DSMP Excel workbook

What’s next?

What's next?

1. Become familiar with the updated Code of Practice
2. Understand what regional rules may apply
3. If applying to land:
   - Develop a Drain Solution Management Plan
   - Use the supporting Excel workbook
4. Maintain awareness of freshwater farm plan updates





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