A staff guide to operating your effluent irrigation system

Travelling Irrigator
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Operating your effluent irrigation system

Understanding how to operate your effluent irrigation system properly is an essential task on farm. This booklet helps take farm staff through the important parts of operating and maintaining a travelling irrigator effluent system. The book can be used as a training guide for those who are new to travelling irrigator systems, or for staff who are new to the farm to introduce them to the farm’s effluent practices and policies.

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Symbols

Throughout this booklet there are activities that you may wish to complete. Inside the back cover is a flip-out worksheet that has the space available for you to complete the small tasks. Once completed, you may wish to remove the worksheet and pin it up somewhere, as a guide for applying effluent on your farm.

This symbol means STOP IMMEDIATELY – throughout the book there are examples of problems that will arise on your farm related to effluent. In most cases if you see any of these issues you must STOP IMMEDIATELY and inform your manager or farm owner.

This symbol means WARNING – throughout the book there are examples of problems that will arise on your farm related to effluent. In most cases if you see any of these issues you must fix the immediate problem if you have permission or have been shown what is required to fix the problem. And then inform your manager or farm owner.

This symbol means CONTINUE – there are examples that show you conditions that are acceptable to continue irrigating effluent.
Our farm policy for effluent

We must ensure that:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>No effluent gets into waterways</td>
</tr>
<tr>
<td>2.</td>
<td>No effluent puddles in any paddocks</td>
</tr>
<tr>
<td>3.</td>
<td>The effluent system is checked daily (minimum)</td>
</tr>
<tr>
<td>4.</td>
<td>If there are problems with effluent, talk to the manager/farm owner</td>
</tr>
<tr>
<td>5.</td>
<td>Effluent irrigation events are checked and recorded against the Effluent Management Plan</td>
</tr>
<tr>
<td>6.</td>
<td>The Resource Consent is displayed in the shed</td>
</tr>
<tr>
<td>7.</td>
<td>The maximum application depth is not exceeded</td>
</tr>
<tr>
<td>8.</td>
<td>The maximum application rate is not exceeded</td>
</tr>
<tr>
<td>9.</td>
<td>Effluent is not applied if the soils are too wet</td>
</tr>
</tbody>
</table>

Potential hazards of effluent irrigation

- Hoses and wires in paddocks whilst riding/driving farm vehicles
- Rotating boom on irrigator
- Falling into the effluent pond
- Breaking the crust on the pond releasing gas
- Crush warning
- Electricity at the pump
- No heavy lifting
- Unstable pontoons
Why is effluent important?

Well managed and maintained effluent systems:

- Grow more grass for less cost
- Grow better tasting grass, therefore cows eat more
- Have fewer messy breakdowns
- Have cleaner water for the community
- Ensure regional council rules are met – no fines
- Obtain greater public acceptance.

What is effluent made up of?

- Wash down water
- Rain
- Faeces and urine
- Spilt milk
- Detergent
- Soil from feet.

What nutrients are in effluent?

- Nitrogen (N)
- Phosphorus (P)
- Potassium (K)
- Sulphur (S).

The value of the nutrients in effluent from 100 cows in an average New Zealand herd is $3000 PA

What shouldn’t be in effluent?

- Chemicals
- Rubbish/afterbirth
- Reject milk
Before every milking checklist

1. Stormwater
   Is the stormwater or wash water diversion in the correct position?

2. Stone trap
   Is the sump/stone trap clear of rubbish/afterbirth?

3. Storage
   Is there enough room in the storage pond or tank for another milking? (Refer to pg 5)

4. Irrigator
   Check the effluent plan. Is the irrigator in the right place? Is there enough run length left for the milking?

5. Pump/stirrer
   Do you need to turn the stirrer or pump on?

6. Yard
   Wet the yard before cows come in

7. Be gentle
   Reduce noise and be gentle with cows during milking

8. Turn hoses off
   Use less water and turn off the hoses

9. Scrape the yard
   After milking scrape yard with scraper before you hose down
Before every milking: check effluent storage

Is there enough available storage for this milking?

- **YES**
  - Milk as normal

- **NO**
  - Why is the storage full?
    - Is the pump broken?
    - Is the pipeline blocked?
    - Did someone forget to turn it on?

Can you fix problem?

- **YES**
  - Fix problem and start milking

- **NO**
  - Notify farm manager/owner

Call the appropriate service person

Tell the service person it is urgent and ask when they can be on site. If necessary call a vacuum tanker to remove effluent. (Add important contacts and their phone numbers on the space provided on your worksheet)

Reduce all water usage in shed

- Turn water off backing gate
- Do not wash down yard.

Start milking and make sure no effluent enters the storage system
Before irrigating: is it too wet to irrigate?

If measuring your soil moisture electronically

1. Check the soil moisture data logger or use a soil probe to get the soil moisture figure for the paddock being irrigated
2. Compare today’s soil moisture figure against the farm’s critical soil moisture figure. The critical soil moisture figure will be the number that decides whether you irrigate or not. Ask your manager/owner what the critical soil moisture figure is for your farm and write it in the space provided on your worksheet.

Check paddocks manually - look and listen. Do not irrigate if:

- There is already water puddling on the ground/worms on surface.
- You can hear/see water or wet mud under foot when you walk.
- It has been raining a lot, snowing or the ground is frozen.
- The soil makes a ‘worm’ when rolled, sticks to your thumb when rolled or free water appears when squeezed.
Before irrigating: hose layout for travelling irrigator

_Using the irrigator_

Do not irrigate within 20m of a waterway

A 3m loop makes the irrigator easier to pull, and less likely to over-apply effluent or break the wire rope

Cow and pasture considerations

- Apply effluent onto short pasture. If possible, graze the area 2-3 days before application
- Avoid grazing pasture within 10 days of spraying effluent, to reduce animal health risks and maximise pasture intake
- Avoid grazing springing or just calved cows on the effluent block - this will help avoid metabolic problems
- Avoid water troughs.

Photo courtesy of Sefton Lonsdale
Rootzone Effluent and Engineering Ltd
How to operate a travelling irrigator

1. Soil
Check the soil moisture. Is it too wet to irrigate?

2. Location
Check the irrigator is in the right location. Check run sheet. Make sure irrigator is away from waterways

3. Remove anchor
Remove the anchor from the post or ground

4. Gear/Brake
Take the irrigator out of gear and take the brake off

5. Wind wire
Wind wire rope slowly

6. Disconnect hose
Disconnect the drag hose from the irrigator

7. Attach
Reverse the bike/tractor towards the irrigator and hook onto the tow ball to move the irrigator to the new run

8. Move
Slowly move the irrigator to the new run. Turn boom lengthways and hang onto it at all times

9. Run the wire
Slowly run the wire rope down the length of the run. Do not go too fast or the rope will tangle
10. Secure anchor
Secure the anchor so it won’t pull off/out

11. Hose
Disconnect the drag hose. Never pull more than 2 lengths (50m) at a time. Disconnect from the hydrant if necessary

12. Tow hose
Tie the rope around the pipe and connect to the tow bar. Tow the hose at the female end to avoid tearing the clips off

13. Connect hose
Lay the hose down the run within 3m of the wire to minimise drag. Re-connect the hose to the irrigator

14. Gear/brake
Put the irrigator back into gear (fast speed) and insert brake

15. Wind wire
Wind up the slack in the wire rope, and check the cut-off on the winch winder

16. Cover troughs
Cover any troughs

17. Record
Record run on the run sheet

18. Check irrigator
Is the irrigator moving forward at the fastest speed with the boom spinning? Is there any ponding?
Can you see a problem?

The following section illustrates the possible problems that may arise in all areas of effluent irrigation. Make yourself aware of these and the required actions of each problem.

STOP the irrigator immediately. Inform your manager or farm owner of the issue. It is important to stop the irrigator as the problems arising will have adverse affects on the farm and farm environment.

WARNING. If you have had prior experience or approval to fix the problem then do so. Inform your manager or farm owner of the issue or phone the appropriate service person.

With the irrigator?

<table>
<thead>
<tr>
<th>Can I see a problem?</th>
<th>What should I do?</th>
</tr>
</thead>
<tbody>
<tr>
<td>The irrigator pressure is too low, or the irrigator has stopped moving. This means the irrigator will apply too much effluent</td>
<td>STOP irrigating and tell your manager/farm owner</td>
</tr>
<tr>
<td>Irrigator is dirty and needs to be serviced</td>
<td>Tell your manager/farm owner or call the appropriate service person</td>
</tr>
<tr>
<td>No nozzle or broken nozzle will result in too much effluent being applied</td>
<td>STOP irrigating and tell your manager/farm owner</td>
</tr>
<tr>
<td>Worn bearings on the irrigator</td>
<td>Tell your manager/farm owner or call the appropriate service person</td>
</tr>
</tbody>
</table>
### In the paddock?

#### Can I see a problem?  
#### What should I do?

<table>
<thead>
<tr>
<th>Can I see a problem?</th>
<th>What should I do?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small puddles or ponding after irrigation that don’t disappear for a while</td>
<td>Tell your manager/farm owner</td>
</tr>
<tr>
<td>Large puddles, ponding or sludge remains for many hours and can be seen on pasture</td>
<td>STOP irrigating and tell your manager/farm owner</td>
</tr>
</tbody>
</table>

#### With ponding in the paddock?

#### Can I see a problem?  
#### What should I do?

<table>
<thead>
<tr>
<th>Can I see a problem?</th>
<th>What should I do?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effluent running off in to waterways, streams or rivers</td>
<td>STOP irrigating and tell your manager/farm owner</td>
</tr>
<tr>
<td>A bad connection between hoses, foaming or puddling leaking from connection</td>
<td>STOP irrigating and reconnect. If parts need replacing tell your manager/owner</td>
</tr>
<tr>
<td>A leak in the pipe - effluent is pooling in and around the pipe in the paddock</td>
<td>STOP irrigating and fix the leak temporarily if possible, tell your manager/owner</td>
</tr>
</tbody>
</table>
Can you see a problem?

With the storage pond?

The following section shows the possible problems that may arise with the effluent storage pond. Make yourself aware of these and the required actions of each problem.

Keep the level of effluent in the storage pond as low as possible:

- To have storage space if you have a breakdown, bad weather or if you are too busy to irrigate
- Irrigate whenever the conditions are right, don’t wait until the pond is full
- Check you have enough storage before every milking.

STOP what you are doing immediately. Inform your manager or farm owner of the issue. It is important to stop adding more effluent to the pond as the problems arising will have an adverse affect on the farm and farm environment.

WARNING, inform your manager or farm owner of the issue.

<table>
<thead>
<tr>
<th>Can I see a problem?</th>
<th>What should I do?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet areas or greener areas around the pond may mean that the pond has a leak</td>
<td>Tell your manager/ farm owner and show them the wet/ greener area</td>
</tr>
<tr>
<td>Grass or solid crust on the top of the pond means too many solids in the pond</td>
<td>Tell your manager/ farm owner</td>
</tr>
<tr>
<td>Cracks in pond walls or the sides of the pond falling in</td>
<td>Tell your manager/ farm owner and show them where the problem is. Make sure there are no safety issues</td>
</tr>
<tr>
<td>Can I see a problem?</td>
<td>What should I do?</td>
</tr>
<tr>
<td>----------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>Pond level too high or high level alarm goes off</td>
<td>DO NOT PUT ANYMORE EFFLUENT INTO THE POND. Tell your manager/farm owner or call the appropriate service person</td>
</tr>
<tr>
<td>The pond never fills up. This may indicate that there is a leak</td>
<td>Tell your manager/ farm owner</td>
</tr>
</tbody>
</table>
### Troubleshooting

#### Problem: Irrigator travels too slow

<table>
<thead>
<tr>
<th>Possible causes</th>
<th>Fixes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrigator is set on a slow speed</td>
<td>Set irrigator to a faster speed</td>
</tr>
<tr>
<td>Nozzle sizes are too big, which will reduce the pressure at the end of the irrigator. This will decrease the number of rotations of the boom</td>
<td>Replace nozzles with new or smaller holes. Recommended size is 11mm and a cone shaped nozzle</td>
</tr>
<tr>
<td>The drag hose has been laid out wrong</td>
<td>Lay hose out properly</td>
</tr>
<tr>
<td>Not enough pressure is coming from pump to operate the irrigator properly</td>
<td>Service pump or get a bigger pump</td>
</tr>
<tr>
<td>Arms at end of boom are pointing too high</td>
<td>Lower arms at end of booms</td>
</tr>
<tr>
<td>Irrigator is travelling up hill</td>
<td>Run irrigator downhill, but not toward waterways</td>
</tr>
<tr>
<td>Drag hose diameter is too small</td>
<td>Replace with a larger diameter hose if the irrigator can pull it and is the pump is capable</td>
</tr>
</tbody>
</table>

#### Problem: Irrigator travels too fast

<table>
<thead>
<tr>
<th>Possible causes</th>
<th>Fixes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arms at the end of the boom are pointing too low</td>
<td>Raise arms at the end of the boom</td>
</tr>
<tr>
<td>Set in wrong gear</td>
<td>Change the gearing</td>
</tr>
</tbody>
</table>

#### Problem: Effluent ponding/puddles or runoff

<table>
<thead>
<tr>
<th>Possible causes</th>
<th>Fixes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application rate too high</td>
<td>Speed up the irrigator and check nozzles</td>
</tr>
<tr>
<td>Soils at saturation point</td>
<td>Pump to holding pond and irrigate later</td>
</tr>
</tbody>
</table>

#### Problem: Blocked nozzles

<table>
<thead>
<tr>
<th>Possible causes</th>
<th>Fixes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effluent contains solids that cannot be pushed through nozzle like fibre, feed or rubbish</td>
<td>Unblock nozzles</td>
</tr>
<tr>
<td></td>
<td>Use a stirrer to break up clumps of solids in sump/pond</td>
</tr>
<tr>
<td></td>
<td>Install a grate over sump and put a rubbish bucket in the shed</td>
</tr>
</tbody>
</table>
### Problem: Irrigator stalled

<table>
<thead>
<tr>
<th>Possible causes</th>
<th>Fixes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrigator stuck on something</td>
<td>Check for problems remove any obstacles</td>
</tr>
<tr>
<td>Hose was laid out wrong</td>
<td>Fix hose and lay out as shown on pg 9</td>
</tr>
<tr>
<td>Pump broken</td>
<td>Call for pump service immediately</td>
</tr>
<tr>
<td>Irrigator broken</td>
<td>Pump to pond. Check wire, winch gearing, and irrigator components. Repair/replace as required</td>
</tr>
</tbody>
</table>

### Problem: Effluent not spraying out of irrigator properly

<table>
<thead>
<tr>
<th>Possible causes</th>
<th>Fixes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not enough pressure from pump to operate irrigator properly</td>
<td>Call for pump service</td>
</tr>
<tr>
<td>Nozzles blocked</td>
<td>Clear out/replace nozzles if needed. Avoid solids entering</td>
</tr>
<tr>
<td>Nozzle sizes are too big, which will reduce the pressure at the end of the irrigator. This will decrease the number of rotations of the boom</td>
<td>Replace nozzles</td>
</tr>
<tr>
<td>Blockage at pump</td>
<td>Remove blockage</td>
</tr>
<tr>
<td>Silting up of mainline</td>
<td>Install a debris basket before sump or stone trap</td>
</tr>
</tbody>
</table>

### Problem: Effluent spraying into waterway, bores, boundaries

<table>
<thead>
<tr>
<th>Possible causes</th>
<th>Fixes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrigation run in the wrong place</td>
<td>Stop irrigating and move irrigator</td>
</tr>
<tr>
<td></td>
<td>Check effluent management plan for correct run locations</td>
</tr>
<tr>
<td></td>
<td>Mark run locations on fences</td>
</tr>
</tbody>
</table>

### Problem: Hose blowout

<table>
<thead>
<tr>
<th>Possible causes</th>
<th>Fixes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor or worn couplings</td>
<td>Replace couplings</td>
</tr>
<tr>
<td>Pipe kinked</td>
<td>Layout pipe correctly</td>
</tr>
<tr>
<td>Couplings installed wrong way around</td>
<td>Put couplings the right way around.</td>
</tr>
</tbody>
</table>
**Maintenance – monthly**

**At the shed**

1. **Empty weekly**
   - Clean the effluent sumps and stone trap

2. **Float switch**
   - Check float switches are clear and working

3. **Storage**
   - Check level of storage ponds

**At the irrigator**

1. **Grease**
   - Grease all moving parts

2. **Nozzles**
   - Check nozzles are not blocked or damaged

3. **Tyres**
   - Check tyre pressure is firm

4. **Battery**
   - Battery of irrigator failsafe/monitor

5. **Winch and wire**
   - Winch and gearing is operating and wire rope is not frayed

6. **Hoses and joints**
   - Clean connections and check hoses have no cuts, splits or bulges
At the storage pond

1. Pipes
Check pipes are running in and out are not blocked

2. Walls
Check pond walls are stable

3. Leaks
No signs of leaks

4. Fence
Check fence is safe and secure

5. Smell
Does the pond smell bad?
Maintenance – 6 monthly

At the shed

1. Pump
   Strip pump, oil and clean and check the pump seals/impeller

2. Pressure
   Check the pressure at the pump, compare against ideal

3. Flush
   Flush clean water through delivery line to clean out pipes and irrigator

At the irrigator

1. Wheel bearings
   Check the wheel bearings

2. Pressure
   Check pressure in the paddock, and compare against ideal

3. Rate & depth
   Measure application rate and depth (see page 23)

Pipes, hoses and nozzles

1. Hydrants
   Check the condition of the hydrants

2. Couplings
   Check the condition of the couplings

3. Replace nozzles
   Replace the nozzles once a year
Sump/stone trap

1. Rubbish
Collect any rubbish out of the sump and/or the stone trap

2. Prepare
If sump/stone trap is wide enough use front end loader, otherwise use a shovel and wheel barrow

3. Scoop
Slowly scoop out the contents taking care not to spill it. Use the low ratio on the tractor to avoid ripping up the entry

Maintenance – annually

At the storage pond

1. Desludge pond (Recommendations do not apply to synthetically lined ponds, call a professional to desludge synthetically lined ponds)
   1. Remove the crust with excavation machinery – warning: gases may be released when crust is first broken so keep clear and away from pond edge
   2. Stir the pond to mix the solids before emptying
   3. Never empty the pond completely
   4. Be careful to not damage the sides/bottom or the liner of the pond when emptying
   5. Pond sludge has more nutrient value than normal effluent, so apply to bigger area at lower rate
   6. Repair any damage to the pond before putting any effluent back in.

2. Grass edges
Control/spray the grass and the weeds around edge of the pond
Maintenance – spreading effluent solids

Spreading direct to pasture

Muck spreader/slurry tanker

1. Transfer sludge to a muck spreader or slurry tanker
2. Check effluent plan for disposal location
3. Add water to the sludge to make it easier to spread
4. Avoid danger zones e.g. waterways, bores, boundaries, creeks etc.

Tractor

1. Check the effluent plan for disposal location
2. Add some water to the sludge to make it easier to spread
3. Spread the load lightly across as large an area as possible
4. Do not dump in one spot.

Stockpiling/composting

1. Check sealed storage area is ready and that the liquid will drain safely into the effluent system or be collected
2. Carefully transport sludge to the storage area
3. Empty sludge onto pile
4. Check that there is no run off.
Monitoring

Understanding application depth

Application depth is how much volume is going on to your soil – usually referred to as depth (mm) – similar to the rainfall you collect in a rain gauge e.g. 20mm.

How much

Understanding application rate

Application rate is how fast it is going on – usually referred to as (mm/hr) similar to the intensity of rainfall e.g. 10mm in 1 hr.

How long

Maximum application rate and depth for different soil types?

Maximum application rate and depth may be set by regional councils. Ask your manager/farm owner for this farm’s maximum. It is not to be exceeded. If there are no figures from the council then the amount of effluent you can apply at one time, and the speed you can apply it at, is dependent on the soil type. Using the table below and having a discussion with your manager or farm owner, fill in the appropriate areas of the worksheet.

<table>
<thead>
<tr>
<th>Soil type</th>
<th>Maximum application depth</th>
<th>Maximum application rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand</td>
<td>15mm</td>
<td>32mm/hr</td>
</tr>
<tr>
<td>Loamy sand</td>
<td>18mm</td>
<td>32mm/hr</td>
</tr>
<tr>
<td>Sandy loam</td>
<td>22mm</td>
<td>20mm/hr</td>
</tr>
<tr>
<td>Fine sandy loam</td>
<td>24mm</td>
<td>17mm/hr</td>
</tr>
<tr>
<td>Silt loam</td>
<td>24mm</td>
<td>10mm/hr</td>
</tr>
<tr>
<td>Clay loam</td>
<td>18mm</td>
<td>13mm/hr</td>
</tr>
</tbody>
</table>
How to test application depth and rate

Test location

Test the application depth at the location which puts the pump under the greatest work load, e.g. at the greatest distance from the pump, or at the highest elevation above pump station.

Collection containers

When testing you can use either rectangle trays with straight sides, rectangle trays with sloped sides or standard round buckets. You will need about 20 of these. You must use a different calculation depending on the type of collection container.

Step 1:

Containers
Before applying effluent, put containers in a line across the path of the applicator:
1. 1-2 metres apart
2. use enough containers across the spray width of the irrigator
3. put a stone in each container to stop it blowing over.

Step 2:

Run irrigator
Run the irrigator as normal:
1. record the actual amount of time that effluent is falling in the containers.
**Step 3:**

Measure the depth of effluent in every ‘wet’ container.

**For RECTANGLE TRAYS WITH STRAIGHT SIDES:**
1. use a tape measure
2. remove the stone
3. measure how deep the effluent is in each container (mm)
4. write down depth for each container.

**For RECTANGLE TRAYS WITH SLOPING SIDES:**
1. remove stone
2. tip effluent into measuring jug record the volume (ml)
3. write down volume for each container.

**For ROUND BUCKETS WITH SLOPING SIDES:**
1. remove stone
2. tip effluent into measuring jug record the volume (ml)
3. write down volume for each container.

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**How to calculate application and depth rates**

*Rectangle trays with STRAIGHT sides*

Record the depth from each container, e.g. on a sprinkler with a 40 m diameter wetted area, there may be 20-40 containers.

<table>
<thead>
<tr>
<th>Container 1</th>
<th>Container 2</th>
<th>etc ...</th>
<th>TOTAL (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>+</td>
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<td>+</td>
<td>+</td>
<td></td>
<td>+</td>
</tr>
</tbody>
</table>

**Note:** Maximum application depth = The CONTAINER with the deepest measurement.

**Tip:** To convert seconds or minutes to decimal, divide by 60 e.g. 21 mins = 21 ÷ 60 = 0.35 hrs.
**Rectangle trays with SLOPED sides**

Record the depth from each container, e.g. on a sprinkler with a 40 m diameter wetted area, there may be 20-40 containers.

<table>
<thead>
<tr>
<th>Container 1</th>
<th>Container 2</th>
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<th>TOTAL (ml)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>TOTAL (ml)</th>
<th>NUMBER OF CONTAINERS</th>
<th>AVERAGE VOLUME (ml)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>CONTAINER WIDTH (mm)</th>
<th>CONTAINER LENGTH (mm)</th>
<th>CONTAINER AREA (mm²)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>1000</th>
<th>AVERAGE VOLUME (ml)</th>
<th>CONTAINER AREA (mm²)</th>
<th>AVERAGE APPLICATION DEPTH (mm)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>AVERAGE APPLICATION DEPTH (mm)</th>
<th>TIME (hrs) (e.g 1hr 15 mins = 1.25 hrs)</th>
<th>AVERAGE APPLICATION RATE (mm/hr)</th>
</tr>
</thead>
</table>

Note: Maximum application depth = The CONTAINER with the deepest measurement.

**Tip:** To convert seconds or minutes to decimal, divide by 60 e.g. 21 mins = 21 ÷ 60 = 0.35 hrs.
**Round buckets with SLOPED sides**

Record the depth from each container, e.g. on a sprinkler with a 40 m diameter wetted area, there may be 20-40 containers.

<table>
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<th>Container 1</th>
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<th>TOTAL (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>NUMBER OF CONTAINERS</td>
<td>CONTAINER WIDTH (mm)</td>
<td>CONTAINER RADIUS (mm)</td>
<td>CONTAINER AREA (mm²)</td>
</tr>
</tbody>
</table>

NOTE: Maximum application depth = The CONTAINER with the deepest measurement.

**Tip:** To convert seconds or minutes to decimal, divide by 60 e.g. 21 mins = 21 ÷ 60 = 0.35 hrs.

For assistance and advice on testing application depths and rates on pivot systems, please contact DairyNZ.
Worksheet

Important contacts

MANAGER ______________________________________

FARM OWNER___________________________________________________________________________________

EFFLUENT SYSTEM SERVICE REPAIR_________________________________________________________________

VACUUM TANKER_______________________________________________________

REGIONAL COUNCIL_______________________________________________________________________________

Farm policy

1. No effluent gets into waterways
2. No effluent puddles in any paddocks
3. Effluent system is checked daily (minimum)
4. If there are problems with effluent, talk to the manager/farm owner
5. Effluent irrigation events are checked and recorded against the Effluent Management Plan
6. The resource consent is displayed in the shed

7. **Pg 22** The maximum application depth is not exceeded
   
   Our consented max application depth is............................................................mm
   
   Based on our soil type ..........our maximum application depth is............................mm

8. **Pg 22** The maximum application rate is not exceeded
   
   Our consented max application rate is............................................................mm
   
   Based on our soil type ..........our maximum application rate is............................mm

9. **Pg 6** Effluent is not applied if the soils are too wet

   **Irrigate**  Less than  Write critical soil moisture figure here  Greater than  **Do not irrigate**
Emergency

The pond is leaking

Puddles on grass

Burst pipes

Overflowing

Blockage

Emergency Numbers:

Farm manager/owner

Regional council

Effluent systems repairs
dairynz.co.nz