K-Line® MAX^{70} EFFLUENT

by aliaxis

K-Line® MAX^{70} EFFLUENT

What You Need.

The process starts with a visit from your consultant to plan the K-Line® effluent system. The consultant will examine the shape and size of your property, land disposal area, the quality and quantity of the effluent supply, effluent rotation and the soil types involved.

Your requirements together with hydraulic analysis, pressure requirements, pump sizes, power systems and budget, will determine the options. K-Line® Max^{70} minimum requirements is a suitable storage pond to draw from. The system typically consists of a pump, main line, sub main and **63mm K-Pipe®** feeder.

Assembly is so simple, many people choose to install the submain, feed and sprinkler lines themselves.

General principles of effluent application would suggest that (depending on consent), an application of **15mm** per shift would be a maximum, with an application area of **8ha/100cows** considered as best management practice (BMP).

Layout of the system

The shift pattern is quite different compared to a K-Line® irrigation system. With an irrigation system it is important to shift the system when it is running. This is not practical when the system is filled with effluent.

The K-Line® Max^{70} lines are therefore shifted when they are not running. The K-Line® Max^{70} lines themselves should be made with either 50mm or 63mm K-Pipe® tubing and should match the K-Line® Max^{70} pod. This allows the same M & F fittings at each end, so the lines can be connected to the submain at either end of the line with the male adaptor. The K-Lines need to be pulled directly from one end to the other, because the lines are short and have only a few pods this process is very easy. The process works for paddocks of all shapes and sizes.

The simple process is as follows:

Go to the submain valve point (1) to isolate the system. Remove the tow hook from the line end (2). Uncouple the feedline from the first K-Line® Max^{70} pod (3), then connect the tow hook onto the K-Line® Max^{70} then tow (dead pull) towards point (G). The K-Line will end up in position (B). Unhook, then re-couple the K-Lineback at the feedline. Repeat this shifting process for the line until the the field has been irrigated completely (position (F). When the field has been irrigated completely, disconnect the sprinkler lines from each other and also from the feed line, tow the sprinkler line into a new paddock and you're ready to start the disposal rotation again.

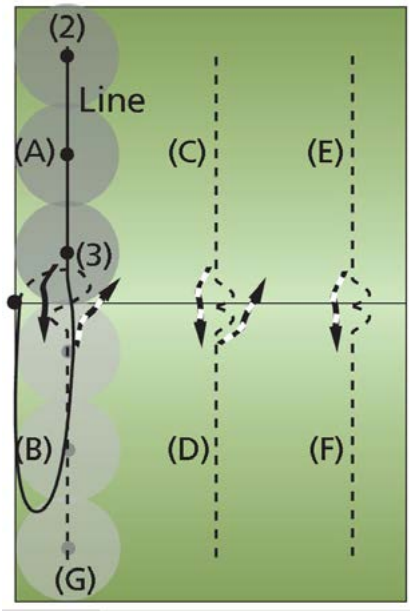


Figure 3
Shifting rotation within a typical paddock (3Pods)
Line moves;
A to B
B to C
C to D
D to E
E to F...

Best management practice

To apply a consent application of 15mm application depth run the system for three to four hours. It is recommended that the effluent disposal area should be 8ha/100 cows as best management practice.

K-Line® MAX70 EFFLUENT

Whether you are storing, transporting or distributing water or wastewater RX Plastics has the solution for you, with manufacturing facilities New Zealand wide and selections of strong supporting brands RX Plastics can assist whatever your requirements.

What is K-Line®?

- K-Line is a flexible hose line sprinkler system originally designed for irrigation. However, the low application rate makes the K-Line system well suited to effluent distribution. At the heart of the system is a series of tough plastic pods protecting a sprinkler, firmly attached to special K-Line low density polyethylene pipe
- K-Line provides an excellent method of liquid disposal options from the many and varied sources
- K-Line systems are all designed to operate at low pressure
- K-Line provide a number of product choices which gives you maximum flexibility in a customised effluent disposal system for your farm
- K-Line will suit any paddock shape, size or terrain
- K-Line is easily moved by any quad-bike or farm vehicle
- K-Line is a low application rate system

Farmer Benefits

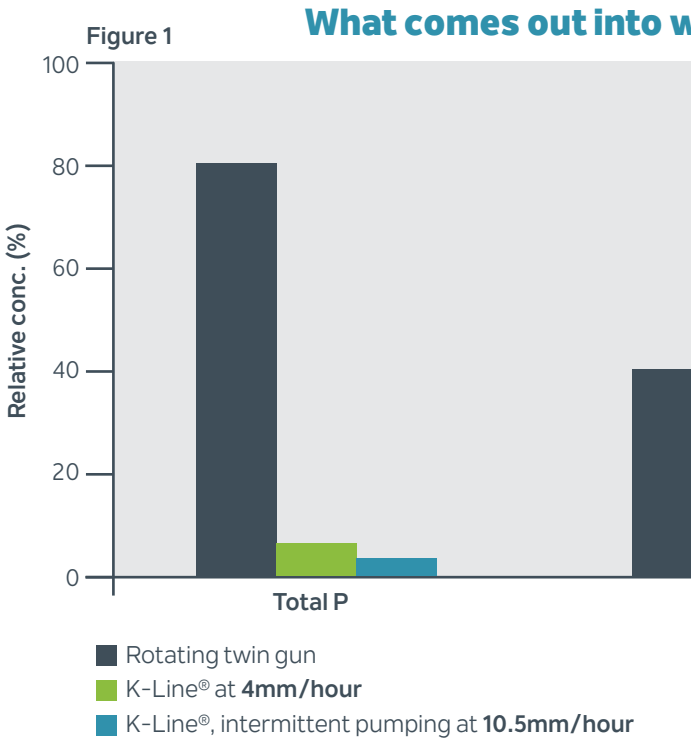
- Low capital cost
- Ease of installation use and shifting
- Tailor application to staff availability
- Low application rate to remove the risk of ponding and run-off, allowing better filtering by the soil of bacteria resulting in better compliance to regional council requirements
- Better retention of nutrients lowers fertiliser requirements
- Control of application with automated timers
- During busy times (e.g. calving) effluent irrigation can be avoided
- Best possible use of the nutrients in farm diary effluent

Production Benefits

- Farmers say that K-Line™ provides them with greater pasture growth rates
- K-Line™ provides a more uniform application compared to travelling irrigators
- More palatable pasture compared with effluent applied by a travelling irrigator
- Trials show the losses of phosphorus and bacteria to drainage water are only 5-7% of the losses of a travelling irrigator when soil is near field capacity
- It also shows nitrogen levels in the drainage are minimised to almost nil (figure 1)

So after effluent application drainage from a 'Mole and Tile' drained paddock after effluent application

Figure 1



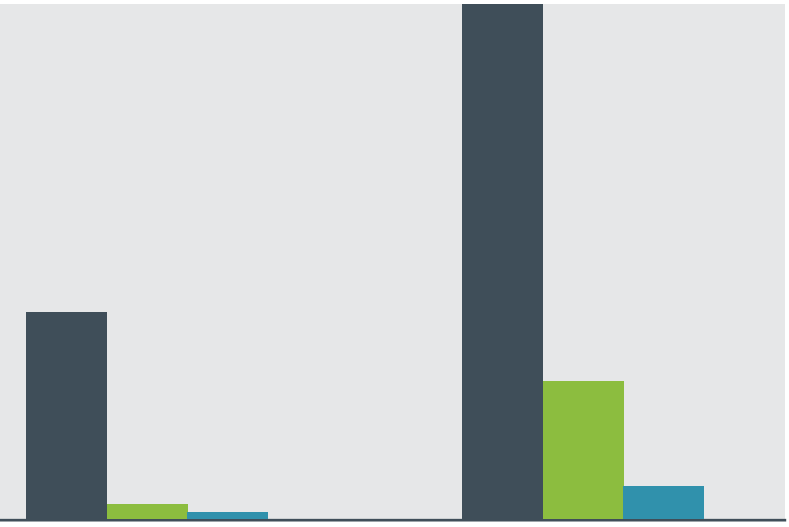
Why use K-Line™ Max[70] Effluent?

- Low rate of application
- No leaching or run-off
- No ponding
- Cost effective
- 3 pods to replace a travelling irrigator
- Large nozzle to eliminate blockages
- Easily separated by camlocks and shifted individually
- Low maintenance
- Meets all regional council requirements

Senninger 7025 S Sprinkler

- The 70 series full-circle sprinklers distribute effluent over a large diameter, for higher volume systems
- Senninger sprinklers can achieve application rates down to as low as 2mm per hour. This reduces the risk of ponding and run-off and other forms of preferential flow. The soil has time to filter nutrients and bacteria
- Outlasts and costs less than brass or aluminium sprinklers
- Built for strength and durability using high-impact engineering-grade thermoplastics and top quality stainless steel components
- Built-in hex wrench for easy in-the-field maintenance standard lower bearing pipe thread: 1" male thread
- 25° angle for maximum distance of throw
- Single nozzle design minimizes clogging

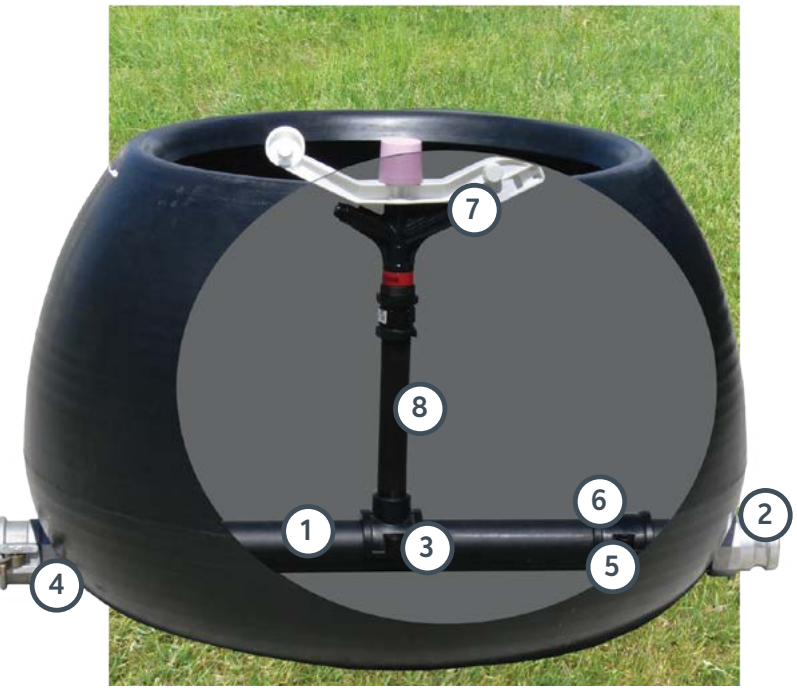
nto waterways from mole and tile.



Sprinkler Operation

- Special Senninger 7025 sprinklers have a range of nozzles down to 5.56mm in size
  However the selection of these are only required when the application rate required is very low
- The figure to the right shows the flow rate and diameter of throw of the recommended K-Line™ Max70 sprinkler nozzles
- Complete flow rates: 1.84 - 7.27 m3/hr

K-Line® MAX70 EFFLUENT COMPONENTS



1 RX PP Riser
for 800mm x 50mm
thread, both ends

2 Cam51A
- Male

3 Plassim
63mm x 25mm
with insert top

4 Cam51D
- Female

5 3 x U Bolts
6 x Nuts
6 x Washers
4 x Spacers

6 **2** x Plassim Saddle
63mm saddle

7 7025 S Senninger
5.56 - 9.53mm nozzles
specifically for effluent
applications

8 **1 x** RXHS 25
- RX Hex socket 25mm

1 x RXPPR 25
- RX poly riser 25mm

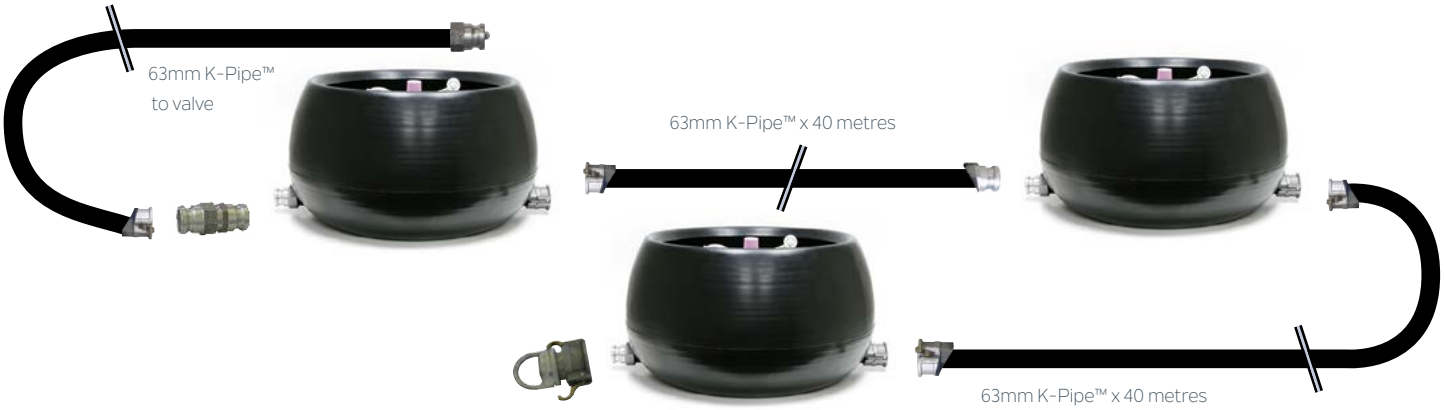


Figure 2. Pressure and flows of the Senninger 7025 S

Pressure (bar)	2.5	2.75	3.0
#20 Nozzle (7.94mm)			
(m^3/hr)	3.67	3.85	4.03
Diameter (metres)	38.3	39.4	40.5
#22 Nozzle (8.73mm)			
(m^3/hr)	4.43	4.63	4.82
Diameter (metres)	38.9	40.6	42.2
#24 Nozzle (9.53mm)			
(m^3/hr)	5.15	5.39	5.62
Diameter (metres)	40.2	41.9	43.6

System components

- The K-Line™ Max70 pod comes complete with 51mm female and male camlocks
- K-Line™ provides a 63mm K-Pipe™ x 40 metres that is M&F (male and female) camlocked (51mm connectors)
- With this combination it means that the lines can be connected in any order to the pods
- To ease shifting K-Line™ also provides male adaptors and end tow units, both 51mm camlocked

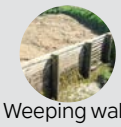
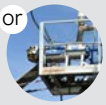
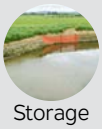
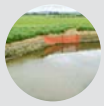
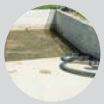
Spacing and Pipe System

- Special 63mm K-Pipe™ tubing complete with M&F (male and female) camlocks come pre-fabricated so as to be able to instantly connect your new K-Line™ Max70 effluent pods
- The special K-Pipe™ is designed to be flexible but highly resilient to the shifting process

Selection Criteria for your K-Line™ Max^{70} System

Selection of a suitable K-LineTM pod and a successful installation is very much dependent on the degree of separation of the solids from the liquids.

For the K-LineTM Max^{70} Effluent pod, the nozzle selection is from **5.56mm - 9.53mm**, therefore the separation of the solids would need to be only slight and the use of the Max70 pod system with large single ponds would be the minimum requirement for successful use. If your effluent system has better separation than this then of course this product will be most suitable also.

	Requirements		Benefits		
	Minimum Filtration	Palatability	Distribution	Application Rate	Nutrient Management
K-Line® Std Naan 5022  330 x 236mm The K-Line® standard has a Naan 5022 sprinkler with a 4mm nozzle and therefore requires the best liquid quality.	 Weeping wall or  Solid Separator &  Storage	Optimum	Optimum	Optimum	Optimum
K-Line® Mid Senninger 5023  560 x 290mm The K-Line® mid has a senninger 5023 sprinkler and a nozzle up to 6.35mm, therefore it can handle a slightly less liquid quality.	  Two Pond Storage	Optimum	Optimum	Optimum	Excellent
K-Line® Max^{70} Senninger 7025  860 x 450mm The K-Line® **Max^{70}** has a senninger 7025 sprinkler and a nozzle up to 9.53mm. It can therefore handle a lower liquid quality.	 Single Pond Storage	Medium	Excellent	Optimum	Good
K-Line® Max^{80} Senninger 8025  860 x 450mm The K-Line® **Max^{80}** has a senninger 8025 sprinkler and a nozzle up to 15.88mm. It can therefore handle the lowest liquid quality.	 Pumping Sump with Stone Trap	Satisfactory	Excellent	Optimum	Okay