FARMERS ¼ ha
DRIP IRRIGATION KIT

Netafim's handbook
for small-scale farmers

NETAFIM™

orbia

TABLE OF CONTENTS

Author: Martin Bahnemann (martin.bahnemann@netafim.co.za)

Version: 1.0 **Last updated:** October 2023

1. NETAFIM SUPPORTS SMALL-SCALE FARMERS

Netafim supports emerging and small-scale farmers by providing appropriate Netafim precision irrigation solutions, and by sharing knowledge of best farming practices through training and skills development. We know that not all farmers are lucky enough to live in climates where regular rainfall is normal. Thanks to its drip irrigation technology, Netafim can help farmers who live in limited rainfall regions manage water by providing the correct amount of water directly to the crop at the correct time. Drip irrigation is recognised as the most efficient irrigation method. Many farmers have halved the amount of water and energy they use with drip technology.

This document will help emerging and small-scale farmers use Netafim drip irrigation correctly to make farming easier and more profitable. It guides the farmer through installing and using the Netafim FARMERS ¼ ha DRIP IRRIGATION KIT. This kit aims to support emerging and small-scale farmers to grow their farming operations and use resources efficiently.

1.1 HOW NETAFIM DRIP IRRIGATION BENEFITS FARMERS:

- Achieve up to 50% in water savings.
- Smaller pumps and pipes can be used that are more cost-effective and easier to in stall, maintain, manage, and run.
- Achieve up to 50% in energy savings.
- Achieve higher yield quality:
  - Crop nutrition management is greatly improved when fertiliser application is incorporated into the drip system.
  - Uniform irrigation and nutrition lead to uniform crop production.
- Improved profitability through increasing yields and quality while reducing costs.
- Drip irrigation offers the highest level of drought resilience.
- Drip irrigation systems are easy to use.
  - The operation of drip irrigation systems does not require physical strength or large implements.
- Drip irrigation's energy-use efficiency makes it ideal to use with natural, renewable, and sustainable energy sources.

The difference drip irrigation can make.This photo was taken on a small-scale farm, the plants on the left are under drip irrigation and the plants on the right are irrigated with impact sprinklers. This farmer is **growing more with less.**

1.2 WELCOME TO THE NETAFIM FAMILY

Netafim is the world leader in precision irrigation. Our purpose is to advance life around the world by helping farmers grow more with less. How – by driving the mass adoption of precision irrigation and providing innovative precision irrigation solutions. Why – to fight water, land, and food scarcity.

Speak to Team Netafim about any precision irrigation questions. Contact the Netafim Technical Advisor or Netafim dealer in your area. You can also visit the Netafim website at www.netafim.co.za to contact us or access a wealth of knowledge.

1.3 DRIP IRRIGATION MUST BE MAINTAINED

Some farmers believe that drip irrigation is too complicated and difficult to use. This is not the case, in fact drip irrigation is easy to use and extremely reliable. However, successful drip irrigation needs good irrigation system maintenance. To grow more with less using drip irrigation, it is important to take the necessary steps to ensure that drippers do not clog and become blocked.

A good drip irrigation system must have the correct filtration to remove dirt or other solids from the water, and the farmer must be able to flush the driplines to remove dirt or other solids that may have built up.

Diligence and care are required to maintain the system and keep it working efficiently.

There are many important steps to follow. Filters must be kept clean. Drip and submain lines must be flushed according to the maintenance schedule.

Once drippers are blocked, they cannot be unblocked again, so blocking must be prevented at all costs. Successful farmers clean their irrigation systems every week or even more often if the water is dirty. If the basic preventative maintenance is done properly, a drip irrigation system can work efficiently for a long time.

1.4 THE LANGUAGE OF DRIP IRRIGATION

Agronomy	Based on the principles of agronomy, agronomists develop the best practices that a farmer will use to grow crops. But every farm is different so farmers finetune and adapt the agronomic recommendations to the needs of their farm. The FARMERS ¼ ha DRIP IRRIGATION KIT has its foundation in good agronomic principles.
Diligence	The careful and determined effort and attention to detail when performing a task, undertaking a project, or taking on a responsibility. It involves being thorough, attentive, and dedicated to ensuring that it is completed accurately and effectively. Diligence is the basis of successfully farming with drip irrigation.
Drip Irrigation	Watering crops by delivering water directly to the root zone of each plant through a network of pipes and drippers.
Dripline	The pipe used to distribute water along crop rows, with pre-installed drippers.
Dripper	Emitters used in drip irrigation to release water at a controlled rate directly to plants' root-zones. Drippers are usually welded into the dripline.
Dripper Flow Rate	The volume of water delivered by a dripper per unit of time, measured in litres/hour.
Dripper Spacing	The distance between drippers along the dripline.
Fertigation	Delivering fertilizers through the drip irrigation system for precise nutrient delivery.
Field Head	Where the valves and filters are placed that service a particular field.
Filter	The device that removes debris, sediment, and other impurities from the water to prevent clogging of drippers.
Primary Filter	The first filter removing the most unwanted material, installed at the system head.

Secondary Filter	A second filter installed at the field head, this is done where the water is very dirty, or the pipelines are very long and there is a risk of debris entering the system after the water passes through the primary filter.
Flushing	The process of removing all dirt and sediment from driplines by opening the ends of the driplines at the furthest point from where the water feeds into the line, this is done while the water is flowing fast. The fast-flowing water carries the dirt and sediment out of the dripline.
Flush Valve	The valve or line end used to open and close the driplines to flush it.
Mainline	The primary pipeline that carries water from the source to the drip irrigation system.
Non-pressure Compensating (non-PC)	These drippers do not have the engineering to moderate water flow under varying pressure. It is used on flat fields. The cost of non-PC driplines is lower than that of PC driplines. Streamline™ X is a non-PC dripline.
Pressure Compensating (PC)	These drippers are engineered to maintain a constant flow rate regardless of changes in pressure, ensuring uniform irrigation. PC emitters are used where fields have significant slopes.
Run Time	The duration of time that the irrigation system operates during each irrigation cycle.
Solenoid Valve	An electrically operated valve that controls the flow of water in the irrigation system based on a timer or controller. When the farm grows and farmers automate their systems, solenoid valves are used to turn water on and off.
System Head (Pump Room)	Where the farm manages its bulk water, initial filtration and fertigation. Large farms manage the entire farm's irrigation from the system head.
Sub-mainline	The smaller pipes that branches from the mainline to distribute water to different fields or sections of the field. Also known as distribution pipes/lines, or header pipes.
Water Source	The origin of the irrigation water, which can be a borehole, well, pond, dam, river, reservoir, or municipal water supply.

1.5 THE DOS AND DON'TS OF DRIP IRRIGATION

DO		
✓	**Plan and design carefully**	The Netafim FARMERS ¼ ha DRIP IRRIGATION KIT is designed by a professional irrigation designer for the small-scale farmer.
✓	**Use quality components**	Netafim Streamline™ X dripline and ScreenGuard™ Mini filters are manufactured to a very high quality standard and are quality tested.
✓	**Optimally space emitters**	With its 300 mm drip spacing and recommended 1 m row spacing, the FARMERS ¼ ha DRIP IRRIGATION KIT is perfect for vegetables and other row crops. Streamline™ X is also available in other dripper spacings to accommodate a wide range of irrigation requirements.
✓	**Practice regular maintenance**	The secret to efficient drip irrigation is regular preventative maintenance. Cleaning filters and flushing the system often is essential. Check for clogging and leaks in the driplines routinely and make the needed repairs immediately.
✓	**Monitor soil moisture**	The best tool for monitoring soil moisture is the farmer, their boots and a spade. Carefully dig open the root-zone and look at the water and root conditions.
✓	**Ensure proper filtration**	Use correct filtration to prevent clogging of emitters and ensure a consistent flow of water. The Screenguard™ Mini with red (130 micron) screen as supplied in the Netafim FARMERS ¼ ha DRIP IRRIGATION KIT is ideal for the recommended use.
✓	**Learn about drip irrigation**	If you are new to drip irrigation, do not start without proper training or consulting the necessary experts. Understanding the principles of drip irrigation is essential to success. Netafim's precision irrigation academy is an online knowledge resource for farmers. Visit www.netafim.co.za

DON'T

✗	**Over-irrigate**	Over-irrigation can stop optimal crop growth, wastes water and energy, and can leach nutrients. All of this eats a farmer's profit.
✗	**Neglect maintenance**	Clean filters and driplines routinely and fix broken components and leaks immediately.
✗	**Mix crop types inappropriately**	Do not mix crops with very different water requirements on a single dripline. Group crops with similar water needs together to optimise irrigation.
✗	**Ignore local climate & weather**	Adjust your irrigation schedule based on your farm's climate conditions and weather forecasts. Reduce irrigation during rainy periods and increase irrigation during hot dry periods.
✗	**Use low-quality components**	Do not compromise on component quality to save money initially. Low-quality components can lead to frequent repairs that will increase costs in the long-term and make the drip irrigation system difficult to manage.
✗	**Overload the system**	Do not connect too many driplines or sections to a single infield irrigation zone or sub-mainline. This will result in poor and uneven water distribution.

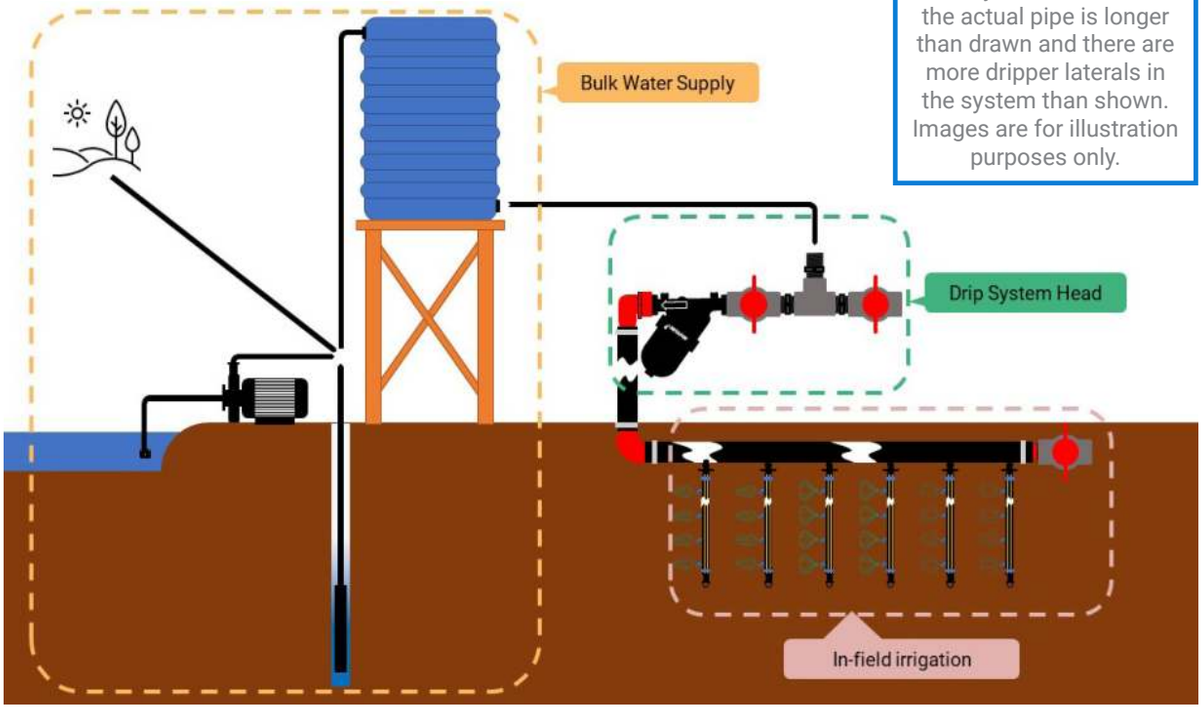
2. WHAT IS DRIP IRRIGATION

Drip irrigation is an irrigation method that delivers the precise amount of water a plant needs directly to the plant's root zone, exactly when the plant needs it. The water is fed to the plant by a dedicated specialised pipe (dripline) that has water emitters (drippers) installed at specified distances inside the dripline. In addition to supplying water, a drip irrigation system can also be adapted to apply fertilizer and other necessary substances directly to the root zone.

Drip irrigation allows the farmer to control many of the manageable aspects that physically affect the growth of a plant.

2.1 THE 3 MAIN PARTS OF A DRIP IRRIGATION SYSTEM

This symbol means that the actual pipe is longer than drawn and there are more dripper laterals in the system than shown. Images are for illustration purposes only.



A drip irrigation system comprises many components, each of which plays an important part in the operation of the system. Drip irrigation systems can range from simple systems operated by the farmer in the field to very complex computer-controlled systems that automatically irrigate, clean filters, and fertilise according to crop requirements.

2.1.1 BULK WATER SUPPLY

Bulk water is the water that is supplied to the tank that feeds the drip irrigation system, it often requires a pump. Bulk water is water that comes from a river, dam, lake, or borehole or if possible, gravity fed from the mountains.

2.1.2 DRIP IRRIGATION SYSTEM HEAD (PUMP ROOM)

The drip system head is where the bulk water is cleaned and distributed to the in-field irrigation system. The filter is placed at the systemhead area where it is easily accessible and easy to clean. The primary (main) filter will be installed in the system head and a secondary filter will be installed at the field head. The individual valves that control irrigation in a specific field is placed together at the system head. Putting all the valves together makes it easier for the farmer to manage and operate the irrigation system. As the farm expands and fertigation is added, the fertigation system will usually also be installed at the system head.

Farmers know that farming is hard work. Successful farmers arrange things so that they can work smart and not hard.

By having the control of the farm's irrigation system in one place, at the system head, the farmer makes it easy to ensure that irrigation is done properly.

A filter is always required in a drip irrigation system to clean the water of solids that can block drippers.

2.1.3 IN-FIELD IRRIGATION

In-field Irrigation is the part of the irrigation system that applies the water to the plant. This part of the irrigation system includes:

- The sub-mainline, this is the pipe that takes the water to the driplines (laterals).
- Driplines, these are the pipes with drippers welded into the wall and are placed in the crop rows.

2.2 WATER SOURCE AND ENERGY CONSUMPTION

Whenever water is pumped it will cost money.

Successful farmers have bulk water supply systems that move the water as cost-efficiently as possible. They use the correct pumps and pipe sizes.

2.2.1 WATER SOURCE

The water source is the place where the farmer gets water for irrigation from. There are two main types of water sources for irrigation water:

- **Groundwater**: this is water that is underground, such as a borehole. Groundwater is generally better quality and is cleaner than surface water. Groundwater may have high iron and manganese levels which may lead to dripper clogging. If iron and manganese levels are high, treatment may be required. Shiny deposits that form over time are often a symptom of iron and manganese.
- **Surface water**: this is water in dams and rivers. It is the most common water source for irrigation. Surface water tend to have lower levels of salts (except for some coastal areas). Drip irrigation systems that use surface water are often less likely to have clogged drippers due to salt deposits.Surface water introduces biological contaminants. If wastewater is being considered as a source, quality and clogging risk must be considered.

RECOMMENDATION

Have your irrigation water tested.

Ask your extension officer to test your water source, advise you regarding the quality of the water, and guide you if it is not acceptable quality.

2.2.2 ENERGY CONSUMPTION IN IRRIGATION

Energy is one of the most expensive input costs for a farmer. Drip irrigation is very efficient in use of energy and other resources. It applies the correct amount of water at the plant's roots for optimal growth. This offers two benefits; it saves money spent on input costs while increasing yield.

Modern irrigation systems need energy at the system head/pump room to lift water from the source and to pressurise it in the distribution network, to filter the water, to push water along the pipes and through the valves and bends to the driplines and drippers which applies the water uniformly to the crop. A drip irrigation system can use up to 50% less energy than an overhead spray irrigation system. Drip irrigation needs relatively low pressure to operate.

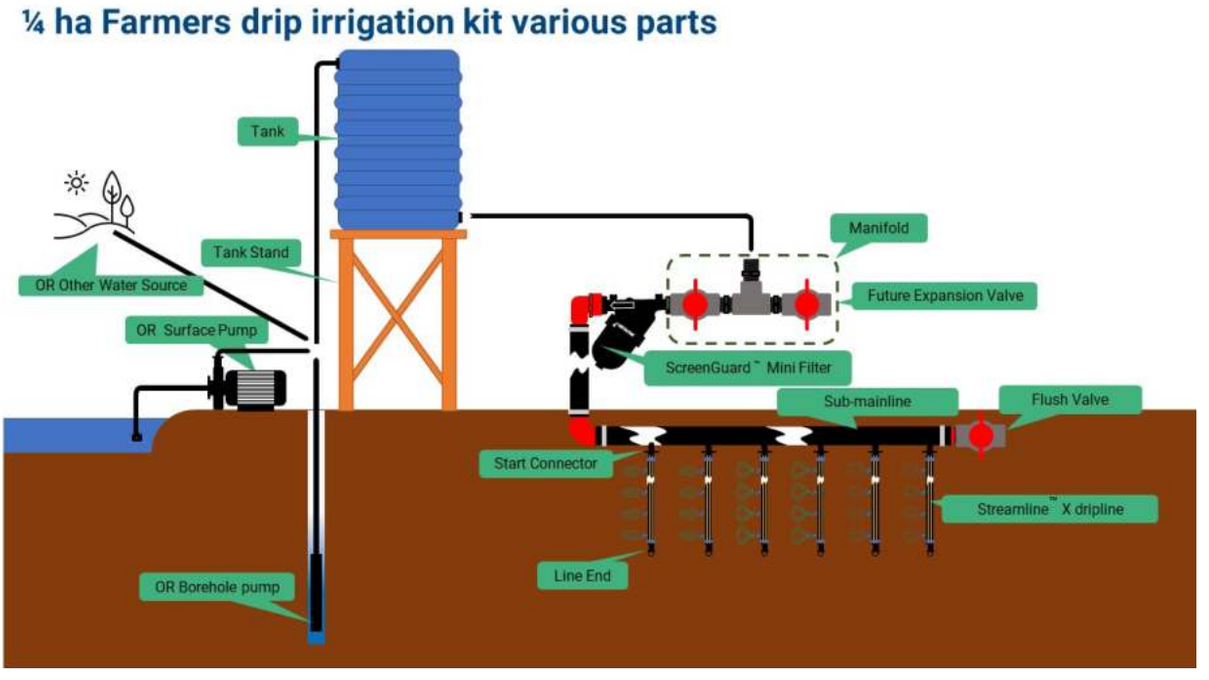
The FARMERS ¼ ha DRIP IRRIGATION KIT can operate with only 2 m pressure. This reduces energy costs and makes it possible to easily use alternative energy sources, such as solar or gravity. If you have access to a water source on a slope that is higher than the field, there may be enough pressure to gravity feed the drip irrigation system. Pumps that work with solar power (Photovoltaic panels) are increasingly available and capable.

Having a reliable power supply is important when producing crops for sale.

Missing even one irrigation cycle can reduce the quality of a crop and lead to lower prices or even an unsellable crop.

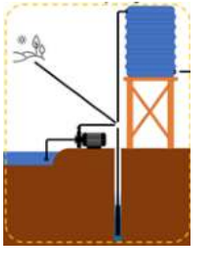
Drip irrigation is the best irrigation system to use with a renewable energy source, such as solar energy. This is because drip irrigation uses relatively low pressures and water volumes when compared to other types of irrigation.

2.1 THE PARTS OF A DRIP IRRIGATION SYSTEM & THE KIT



2.1.1 BULK WATER SUPPLY PARTS

To get water to the farm or the place on the farm where the water is needed, a farmer will usually use a pump. There are fortunate farmers who have water that comes from a water source at a higher elevation, in this case the farmer just needs to place a pipe in the correct position in the stream to ensure that there is enough water at the correct pressure reaching the drip system head.



BULK WATER SUPPLY

PUMPS

The farmer must supply a pump if necessary. There are many different types of pumps, but farmers will typically use either:

- A centrifugal pump if the water comes from a dam or river. These pumps are powered with either an electrical motor, or a petrol/diesel engine.
- A borehole pump if water is pumped from a borehole. In agriculture, borehole pumps are generally electrically powered.
- Solar power is becoming more accessible to farmers. Options can be explored in this regard.

TANK/WATER STORAGE

The farmer must supply a tank if necessary. Plastic rotomolded tanks are ideal to use as water storage for drip irrigation systems. Other water storage systems can also be used. If the farm already has a reservoir, it may be suitable to use for the drip irrigation system. Ask the necessary experts when in doubt.

TANK STAND

The farmer must supply a tank stand if necessary. The FARMERS ¼ ha DRIP IRRIGATION KIT requires a minimum pressure of 2 m. The bottom of the tank must be at least two metres above the crop field level. This will ensure that there is enough pressure to allow water to flow through the irrigation system properly and ensure that all plants will receive the correct amount of water.

If a tank is used, it must be on a tank stand that is strong enough to carry the weight of the water in the tank when full. Keep the lid on the tank to keep the water clean.

Water weighs 1 kilogram per litre. A 5000-litre tank will weigh 5000 kg or 5 tons when full.

(This is more weight than that of three pick-ups on the tank stand).

The stand must be strong enough to carry the weight.

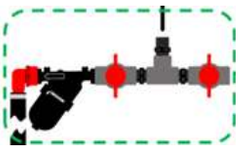
RECOMMENDATION

Use a plastic tank with a capacity of 5000 litres to store water for the FARMERS ¼ ha DRIP IRRIGATION KIT.

Plastic tanks do not contaminate the water. Make sure the tank is firmly tied down to the stand otherwise a strong wind can damage the tank.

2.1.2 DRIP SYSTEM HEAD

MANIFOLD

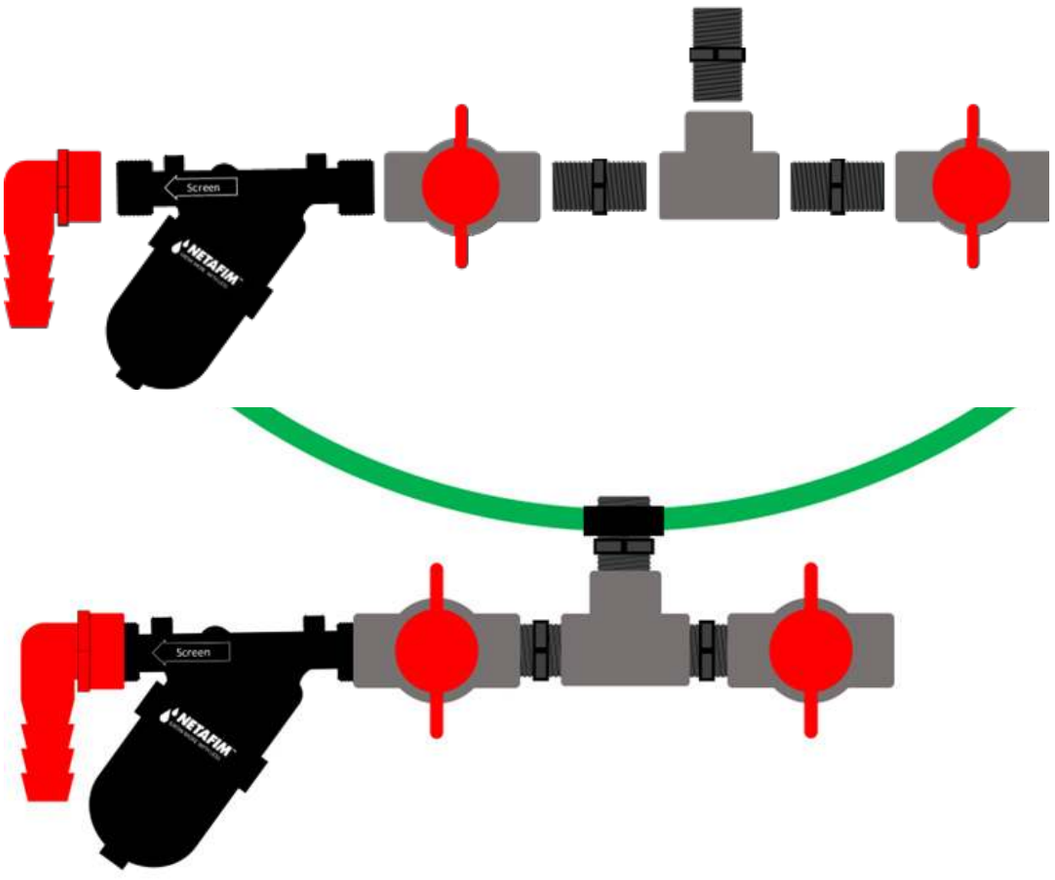


DRIP SYSTEM HEAD

The manifold is the name given for all the valves and pipes that are joined together and controls the flow of water to the in-field irrigation. As the farm and irrigation system grow more valves, filters and other parts will be added to the manifold.

The recommended setup of the manifold for the FARMERS ¼ ha DRIP IRRIGATION KIT is as per the graphic below (the green part circle represents part of the tank). If possible, connect the manifold directly into the tank outlet or use the shortest length of 50 mm suitable pipe possible.

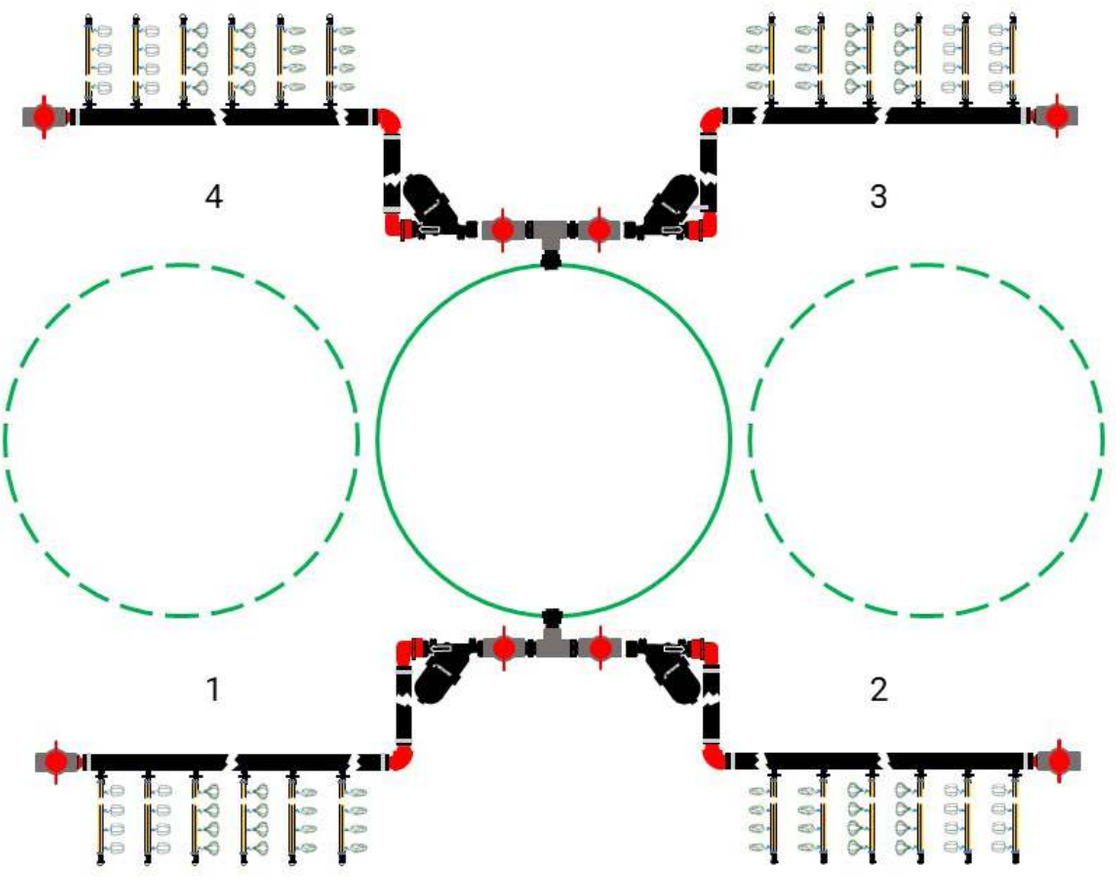
Follow the diagram below for the correct assembly of the manifold parts supplied in the Netafim FARMERS ¼ ha DRIP IRRIGATION KIT.



FUTURE EXPANSION

The Netafim FARMERS ¼ ha DRIP IRRIGATION KIT is designed to be expanded with the farming operation as it grows. A future expansion valve is provided. This is a valve that enables you to easily install another FARMERS ¼ ha DRIP IRRIGATION KIT in the system.

Up to four FARMERS ¼ ha DRIP IRRIGATION KITS can be linked together to irrigate one hectare.

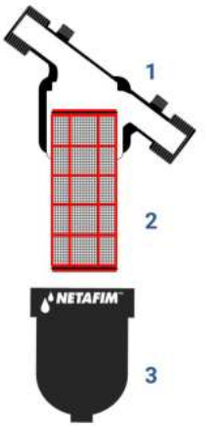


Additional FARMERS ¼ ha DRIP IRRIGATION KITS can easily be added together (see 2, 3 and 4 in the diagram above) to irrigate a larger growing area. The future positions of additional tanks are also shown. This is especially useful for farmers who plans to expand their operation, but do not want to spend a large amount of money at once, but also want to plan for future growth.

Your Netafim Technical Advisor will assist you as necessary, please feel free to contact them.

SCREENGUARD™ MINI FILTER

The ScreenGuard™ Mini filter supplied in the FARMERS ¼ ha DRIP IRRIGATION KIT is a tough, efficient, and reliable screen filter.

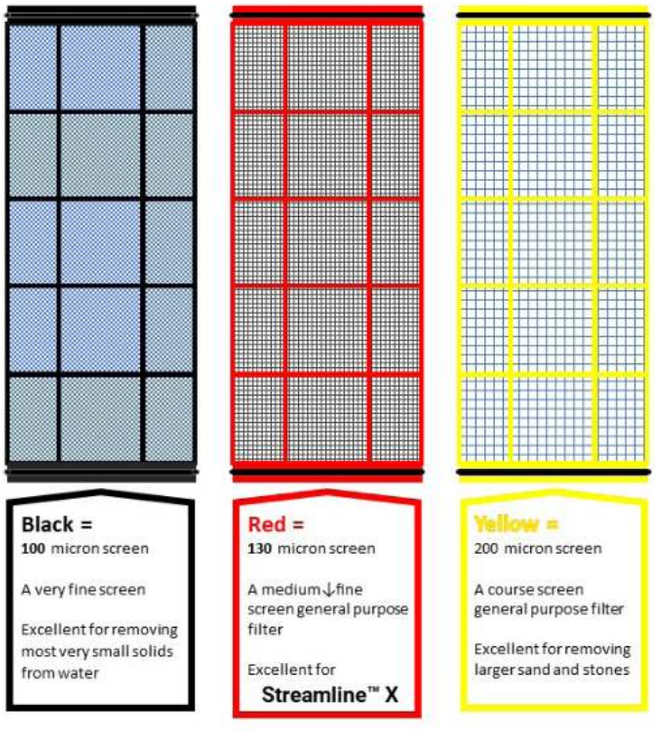


The parts of the filter:

1. **Filter body:** The part of the filter that connects to the irrigation system.
2. **Screen:** The part of the filter that removes the dirt from the water and must be regularly cleaned.
3. **Filter cover:** The part of the filter that screws into the filter body and holds the screen in place.

The ScreenGuard™ Mini filter supplied in the FARMERS ¼ ha DRIP IRRIGATION KIT will remove particles that are larger than 130 microns from the water.

Netafim ScreenGuard™ Mini screens are colour coded. Red is 130 micron, black is 100 micron and yellow is 200 micron.



Never use a filter that with a too course filtration grade (holes that are too big) in relation to the drippers. The emitters will clog, which cannot be reversed.

Streamline™ X requires a filtration grade of 130 micron (red discs) or finer (black discs).

Do not use a filter screen that is broken.

The large particles that pass through the break will lead to dripper clogging.

IMPORTANT

Always mount your ScreenGuard™ mini filter with the screen positioned according to the arrow on the body that reads screen.

The arrow shows the direction that the water moves through the filter, and it must point away from the tank towards the in-field system

Be careful not to over tighten the filter cover. It can be hand tightened.

The O-ring in will prevent leakages.

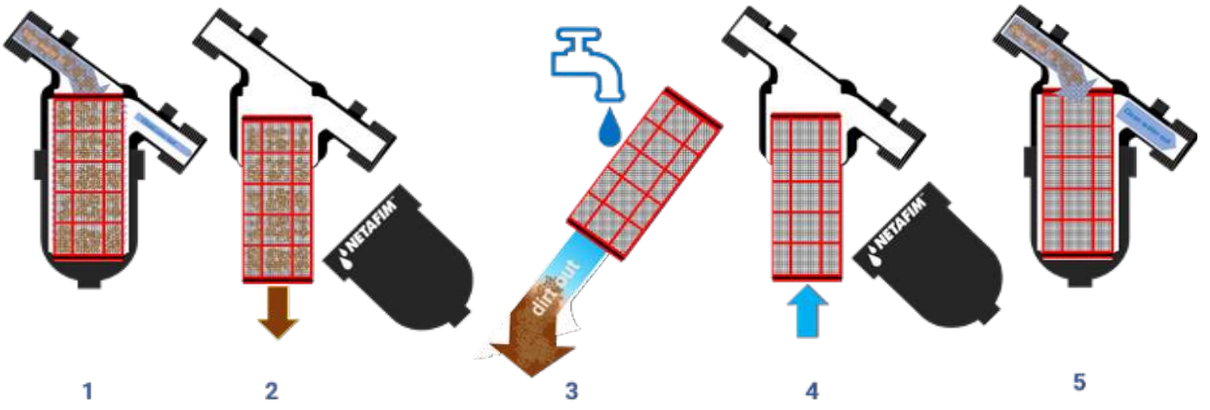
How long a drip irrigation system will work efficiently, is directly affected by the amount of dirt and other solids that get into the system. The correct filter is the most important way of preventing this.

RECOMMENDATION

Upgrade your screen filter to a disc filter as your business grows. These are filters that use a cylinder of compressed discs to remove particles from the water.

Each disc has grooves that run in alternate directions that criss-cross when two discs are placed on top of each other, forming a series of meshes. These filters are extremely strong and efficient.

Filters are available in many different variants and most larger farming businesses use self-cleaning filters with technology that automatically keep the filter clean.



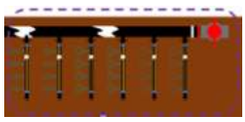
IMPORTANT

CLEANING THE SCREEN OF YOUR FILTER

It is very important that the water to the filter is turned off before the filter is opened. If this is not done the filter cover could fly off and cause serious injury.

1. Clean the filter regularly before the water flow starts to drop and the crop stops receiving the water it needs.
2. Carefully unscrew the filter cover from the filter body. The filter screen is press-fit. Take the filter screen out of the body with a gentle pull and twist.
3. Rinse the filter screen with clean water until all the dirt is gone. Do not use a hard item like a stick or a coarse brush to remove stubborn dirt, rather use a soft brush if necessary.
4. Reassemble the filter by gently pushing the filter screen into the filter body till it is properly seated against the filter body. Screw the filter cover back onto the filter body.
5. Open the water and check that everything is working properly.

2.1.3 IN-FIELD IRRIGATION



IN_FIELD IRRIGATION

SUB-MAINLINE

The farmer must supply the pipe for the sub-mainline. The sub-mainline is the pipe that delivers water to the driplines/laterals it is also sometimes known as the distribution pipe.

- It is usually installed down the side of the field with the driplines running off one side. It can also be installed in the centre of the field, with the driplines running off from both sides.

- It is very important that the sub-mainlines are flushed once all the laterals have been connected and once all connections are fixed.

RECOMMENDATION

The Netafim FARMERS ¼ ha DRIP IRRIGATION KIT is designed to be used with 50 mm Low Density Polyethylene (LDPE) pipe Class 3 as the sub-mainline.

FAST CONNECT METHOD

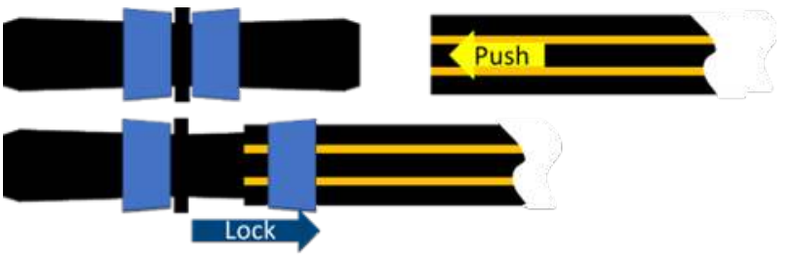
The connectors supplied in the FARMERS ¼ ha DRIP IRRIGATION KIT all use the fast connect method. It allows a farmer to easily connect and disconnect fast connectors to drip laterals without using tools or damaging the laterals.

To connect and disconnect the dripper laterals with fast connectors the following actions are needed, the different types of fast connectors use the same action:

To connect:

1. Push the dripper lateral onto the fast connector so that it is straight on the connector with no folds.
2. Slide the ring over the dripper lateral until it sits tight and clicks.

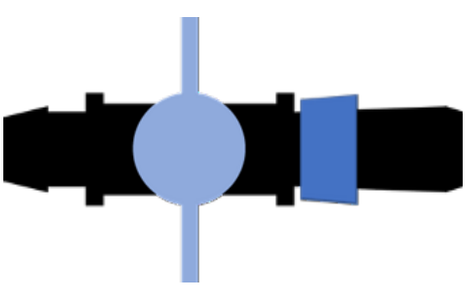
The diagram below shows how easy it is to use a fast connector.



To disconnect:

FAST START CONNECTORS

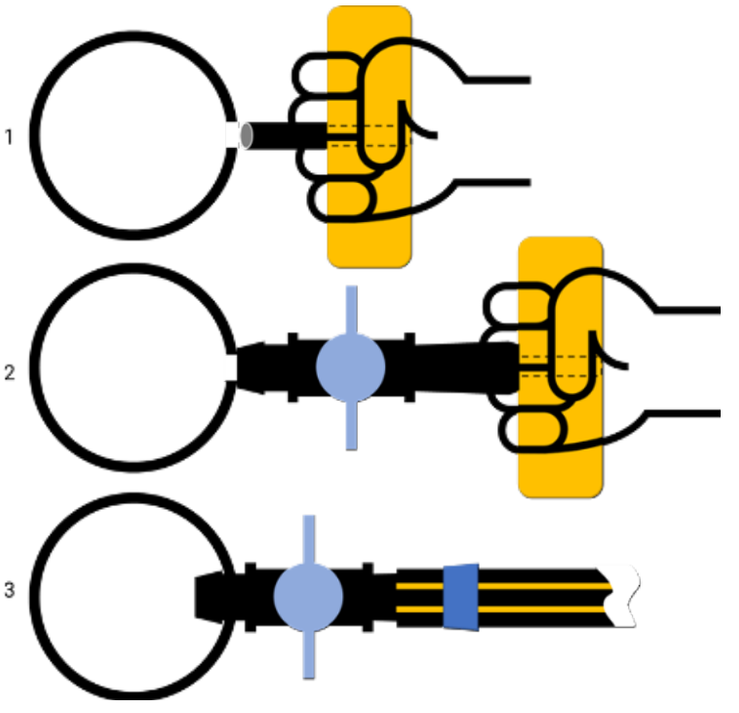
Start connectors are the fittings that are pushed into a hole punched into the sub-mainine. The Streamline™ X driplines in the kit must be attached to the start connector. The valve allows a farmer to only irrigate certain areas of the field when necessary.



A fast start connector is connected to the sub-mainline as per the diagram below.

1. Punch a hole into the 50 mm sub-mainline using the punch. It is important not to make the hole too big otherwise there will be a risk of leaking.
2. Using the punch as shown, firmly push the fast start connector into the hole. The punch is designed to both make the hole and insert the connector.

Inserting the fast start connector will take some effort, but a tight fit is essential to prevent leakage.



Use a firm push and twist action with the punch to make the hole through the wall of the sub-mainline.

Remove the plug from the hole by forcing it out with the supplied plunger.

2.1.3.4 FAST CONNECTOR

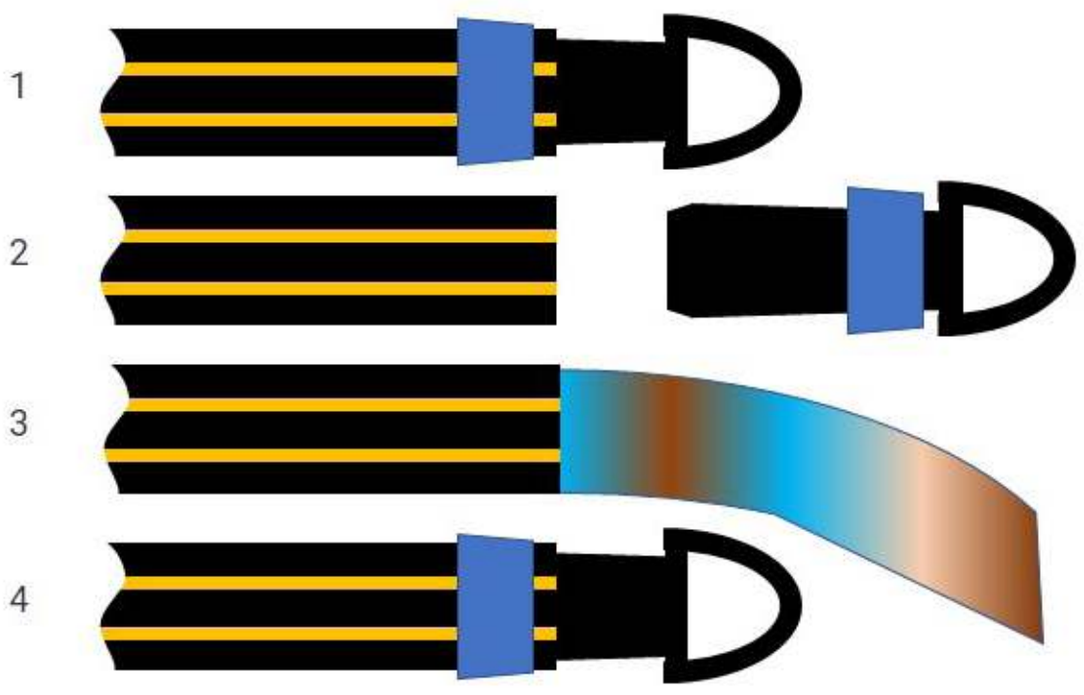
The fast connector is used to connect two Streamline™ X driplines. It is used to repair a pipe that is damaged or to lengthen a lateral that is too short.

FAST LINE END

The fast line end is a plug that is easy to insert, remove and use. It is used at the end of a Streamline™ X dripline to seal the end of the pipe and open it to allow flushing. A fast line end makes it very easy to flush the dripline.

How to flush a lateral with a fast line end:

1. Ensure that the water is turned on and that water flows through the dripline.
2. Release and remove fast line end.
3. Allow water to flow out of the dripline until the water runs clear. Sometimes the dirt will come out of the pipe in two pulses. The first pulse will be all the dirt that is collected at the end of the pipe. The second pulse will come after a short while and will be the dirt that is laying in the pipe. Make sure you do not miss the second pulse. If in doubt, flush for at least 2- 3 minutes.
4. Replace the fast line end.

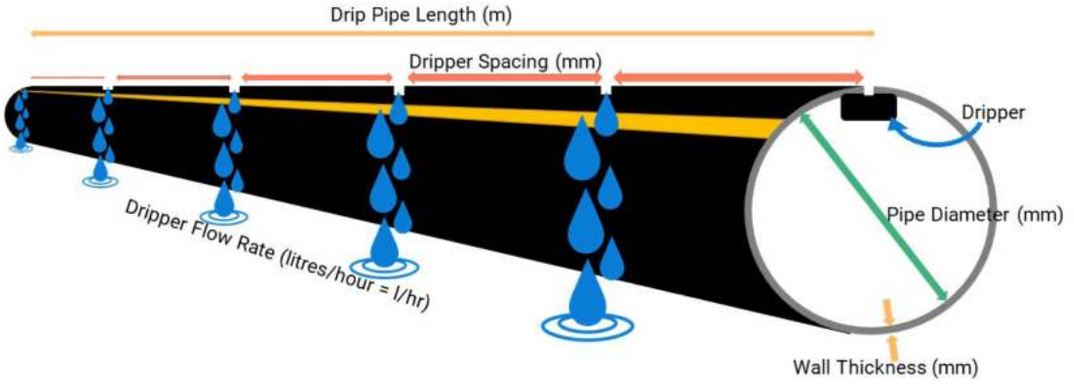


STREAMLINE™ X DRIPLINE

The heart of the Netafim FARMERS ¼ ha DRIP IRRIGATION KIT is the Streamline™ X dripline and the Screenguard™ Mini filter .

What is Streamline™ X dripline?

Streamline™ X is the toughest thin-wall dripline ever made. It is a high-quality thin-wall dripline that is ideally suited to growing vegetables and other row crops.



KNOW YOUR DRIPLINE

Dripline length: The maximum length that the dripline can be.

- The maximum pipe length for FARMERS ¼ ha DRIP IRRIGATION KIT is dripline 50 m.

Dripper spacing: How close the drippers are to each other.

- The FARMERS ¼ ha DRIP IRRIGATION KIT uses Streamline™ X with 300 mm dripper spacing.
- A dripline with drippers spaced every 300 mm will deliver double the amount of water than that of a dripline with 600 mm dripper spacing.

Dripper: The device that delivers the correct amount of water to each plant.

- At 10 m pressure a dripper in the Streamline™ X in the Netafim FARMERS ¼ ha DRIP IRRIGATION KIT delivers 1.6 ℓ/hr, at lower pressures the flow rate will be lower.

Pipe diameter: The bigger the pipe diameter the more water can flow through the pipe and the longer the lateral can be.

Streamline™ X is manufactured in many different configurations where dripper delivery rate and dripper spacing vary. This allows it to be tailored to irrigate a variety of crops.

KNOW YOUR DRIPLINE COIL LABEL

Length = the total length of dripper pipe that is on the coil

Spacing = the distance between the emitters on the drip lateral

Flow rate = the amount of water in litres that will pass through one emitter in one hour at 1 bar pressure

W.T. = Wall Thickness of the pipe

I.D. = Internal Diameter of the pipe

The specifications of the Streamline™ X dripline supplied in the FARMERS ¼ ha DRIP IRRIGATION KIT are:

- 16.2 mm internal diameter
- 0.2 mm wall thickness
- 1.6 ℓ /hr dripper flow rate at 10 m pressure
- 2 500 m coil length

Pressure is measured in vertical height only.
1 bar =1 kPa = 10 m

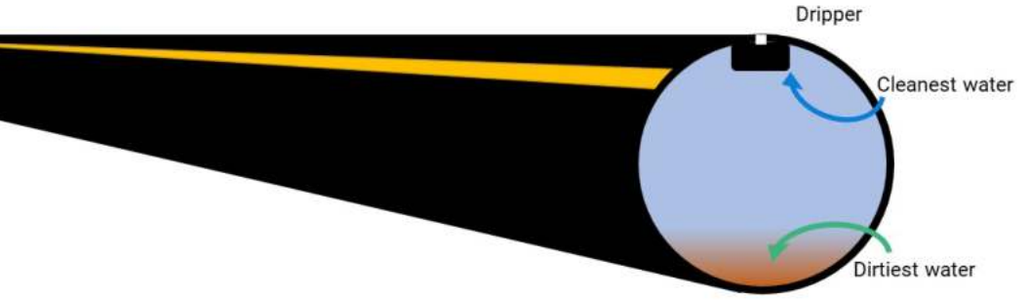
The FARMERS ¼ ha DRIP IRRIGATION KIT needs minimum pressure of 2 m.

INSTALLING STREAMLINE™ X

If properly installed and looked after, Streamline™ X can be used for up to three seasons. The design of the FARMERS ¼ ha DRIP IRRIGATION KIT enables you to only replace the driplines when the need arises, all the other components can remain in place for many years.

Don't forget these important considerations when installing Streamline™ X:

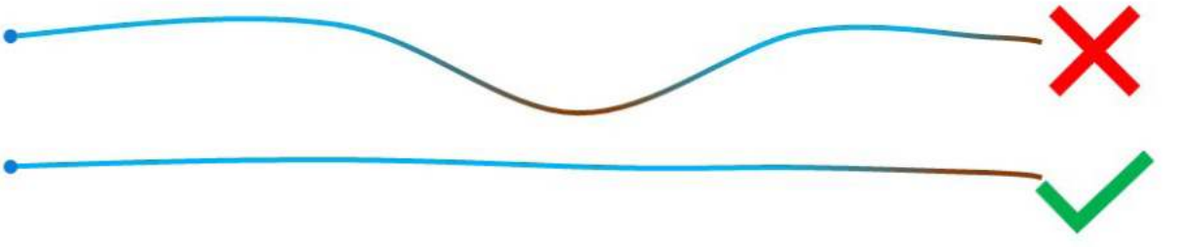
- Keep the dripper facing upwards. If the dripper is facing upwards, the dirt and other solids that collects in the dripline will not be able to block the dripper.
  (See the illustration on the following page)



There are always some dirt and other solids in the water that will collect at the bottom of the driplines.

This is very fine dirt that can pass through even the finest filters.

- Keep the driplines clean by flushing each lateral before the lines are used.
- Make sure that the lowest point of the lateral is the bottom of the lateral pipe. Any significant dips will cause dirt to be collected.



- Always make sure the Streamline™ X dripline is rolled on and off the coil carefully.
- There must be no folds and knots that can drag along the ground. The folds and knots will be the places where leaks occur due to line damage.
- Uncoil the dripline by allowing the coil to spin. Do not pull the pipe off a coil that is not rotating places where leaks occur due to line damage.

3. AGRONOMY

How to successfully grow a crop on a farm is the skill that a farmer brings. This is a skill of adapting the basic production recipe to the unique conditions on the specific farm.

Farmers harvest sunshine by using plants to convert the sunshine into produce. The most important input that a farmer can manage to optimise the conversion of sunshine into food is water.

Managing water means supplying the correct amount of water at the correct time according to the crop's needs:

- Too little water and the crop will be stunted and not grow properly.
- Too much water and the crop will drown.
- Applying too much water is the same as throwing money away because every additional drop applied costs the farm er effort and money.
- Fertiliser only becomes available for the plant to use if there is water to assist the fertiliser to pass into the roots.

A farmer can apply the perfect amount of fertiliser to the crop, but if the crop is not getting water the fertiliser will be of no benefit.

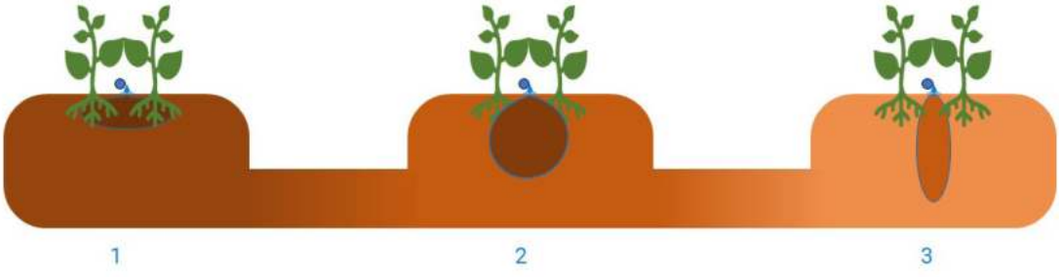
But if a farmer only supplies water and no fertiliser there will still be some crop to harvest

Good farmers are good water managers.

3.1 WATER MOVEMENT THROUGH SOIL

3.1.1 HOW WATER MOVES THROUGH THE SOIL

The texture of the soil (the ratio of sand to silt to clay) influences how much water a farmer must apply to the crop at any one time.



1. When the soil contains a large amount of clay, it is known as a heavy soil. Water will move very slowly through the soil and stay in the root zone for a long time. The water also moves sideways away from the emitter easily. These soils will generally need irrigation less often for longer when compared to a loamy soil. Water infiltrates a heavy soil slowly, there is therefore a higher risk of over-irrigating a soil with a high clay content. This can create a waterlogged condition in the root-zone which will stunt growth.

2. A soil that is in between heavy and sandy soil is known as a loam. These are ideal soils for growing plants as they have a good balance of particle types. This gives the soil good water holding capacity while having good drainage and aeration.

3. Sandy soils do not hold water as well as loamy soils. The water moves through the soil profile quickly. The water does not spread out sideways as much as soils that have a high clay content. These soils will generally need irrigation more often for shorter periods when compared to a loamy soil. Sandy soils have low water holding capacity therefore the risk of not irrigating enough is higher.

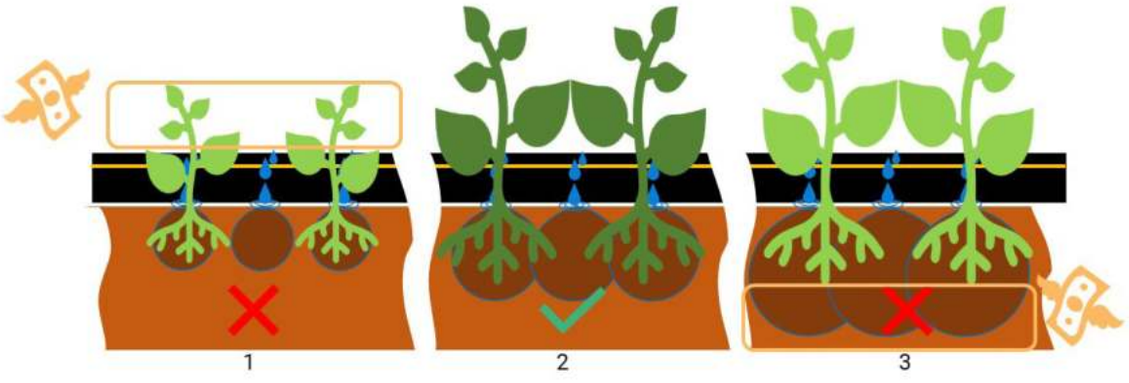
RECOMMENDATION

Using ridges in with drip irrigation is an ideal combination. It is easier to manage the soil, weeds are easier to control, and water is easier to manage.

3.1.2 HOW TO MONITOR WATER IN SOIL

There are many sophisticated tools available to measure how much water is in a soil profile. In the case of small farmers, the best tools to monitor soil moisture conditions are the farmer and their spade.

By digging open the soil where the plants are growing a farmer can easily and quickly see if too little, just the correct amount or too much irrigation water is being applied.



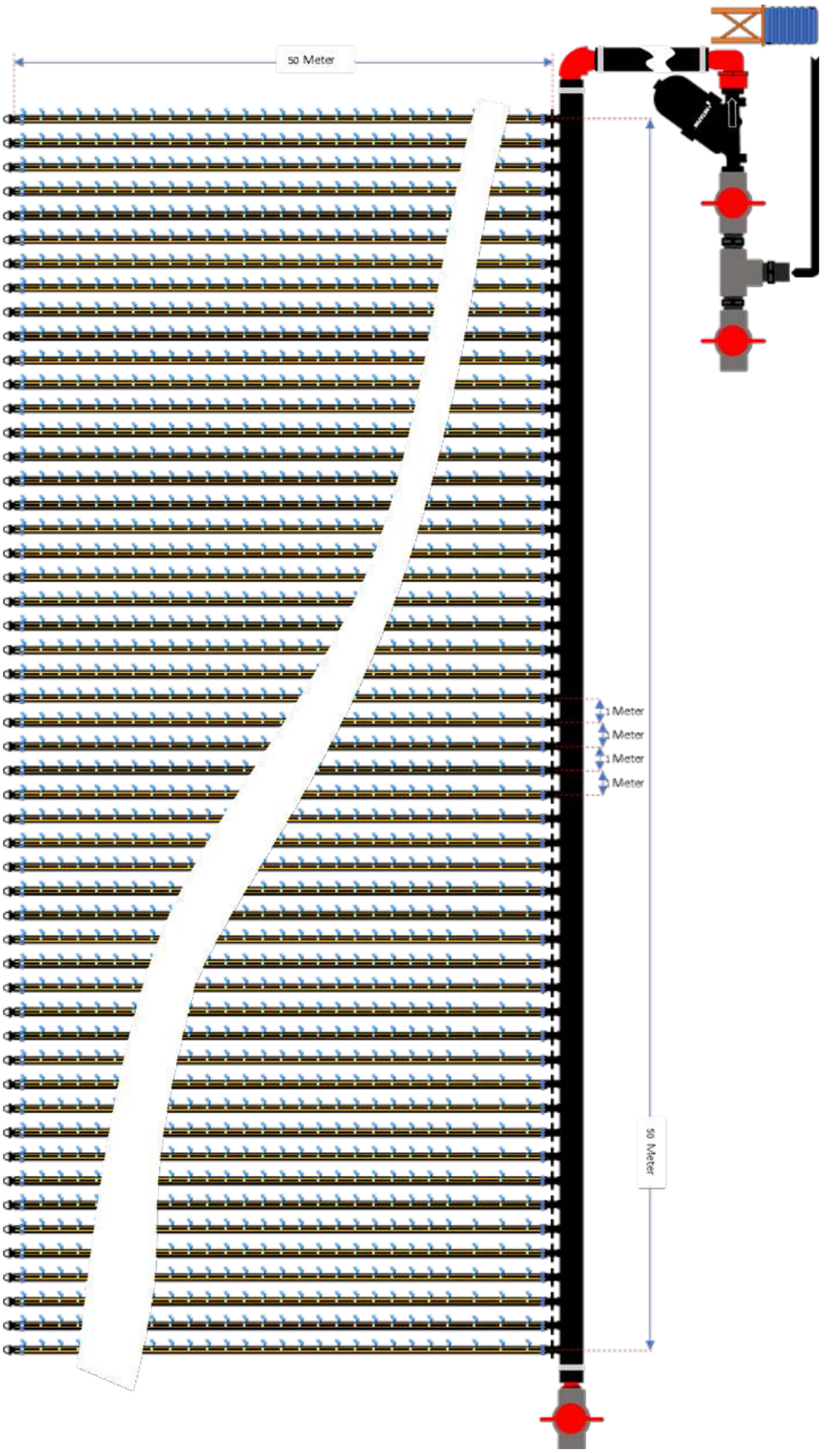
1. Too little water – crop will not grow properly.
2. Correct amount of water – crop can grow optimally.
3. Too much water – crop will not grow properly, and all excess water is lost and gives no value even though the farmer has provided it.

4. CONCLUSION

By using Netafim drip irrigation technology, you are joining many successful farmers who grow more with less.

- You will harvest a higher yield of higher quality.
- Less water, energy and fertiliser will be used, saving money.
- As a farmer you will lessen your workload so you can concentrate of developing the other aspects of your business.

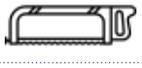
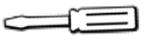
5. GENERAL LAYOUT OF THE FARMERS ¼ ha DRIP IRRIGATION KIT



6. WHAT IS IN THE FARMERS ¼ HA DRIP IRRIGATION KIT

IMAGE	DESCRIPTION	QUANTITY/DETAILS
	Streamline™ X 16080 16384-000001 Non-pressure compensating integral thin-wall dripline	1.60 ℓ/h 0.30 m x 2500 m (1 coil)
	ScreenGuard™ Mini filter 71970-000901	Sg m pl y 2" 515 bspt 130m + cap
	Fast start connector with valve	50
	Fast line end	50
	Fast connector	10 (for repairs)
	PVC ball valve threaded 50mm	3 (extras included for when additional kits are added - to be stored until expansion)
	PVC female threaded T	1
	Nylon nipple 50 mm	3
	Nylon male adaptor 50 mm	1
	Nylon female elbow 50 mm	1
	Nylon elbow 50 mm	1
	Hose clamp for LDPE pipe 50 mm	4
	PTFE thread sealing tape	1

7. HAND TOOLS REQUIRED FOR INSTALLATION

IMAGE	DESCRIPTION	DETAILS
	Measuring tape of at least 50 m	The maximum recommended length of a dripper lateral is 50m
	Hacksaw	For cutting pipes
	Screwdriver	For fastening hose clamps
	Utility knife (Stanley type)	For cutting dripline
	Pipe wrench	For assembling manifold components

Other tools may be required based on the circumstances of the installation and farm.

To the farmers of Africa who feed Africa

Scan the QR code
to connect with
Netafim on WhatsApp

CONTACT US TO FIND OUT HOW YOU CAN GROW MORE WITH LESS
infoza@netafim.com | www.netafim.co.za

NETAFIM™

orbia