K-LINE IRRIGATION™

# K-Line Irrigation
# 5 Pod Farm Pack
## suitable for 1 hectare

Installation and user manual

an Aliaxis company

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RXP RX PLASTICS

# STEP 1: **View the K-Line Installation DVD**

Please review the K-Line Installation DVD to become familiar with the K-Line System.

# STEP 2: **Identify System Components**

32mm Tapping Saddle (5)
KLTPS32

Sprinkler Adapter (5)
IMPACT-ADAPTOR

Sprinkler w/Red Nozzle (5)
IMPACT5022-RED

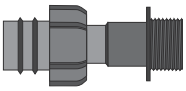
K-Line Pod (5)
KL.STD.POD

Hook Cap (1)
RXGHC32

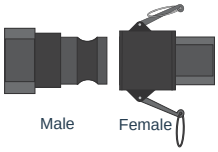
#8 Metric Nuts & Washers
(10)

K-Line Installation DVD

32mm Tubing (100 m.)
K.PIPE32.100



Male Adapter (2)
KLMC32

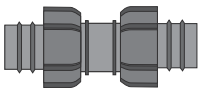



Camlocks
CAM32A & CAM32D

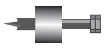
Black & Orange Nozzles*
(5 each)
NOZZ5022-BLK
NOZZ5022-ORG
*Alternative nozzles for sprinkler

Rope (2 m.)
KL-ROPE

Drill head Adaptor
3/8" drive x drill head
KLTL3.8.DRILL.ADAP



Straight Coupling (1)
KLSC32

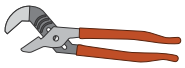


14mm Spade bit w/limiter x 13mm Hex
KLTL14.DRILL

13mm metric deep socket x 3/8"
KLTL3.8.13SOCKET

# STEP 3: **Tools Required for Installation**

Adjustable pipe wrench



Large channel lock pliers

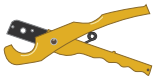
Rubber mallet

3/8" Ratchet wrench

Socket extension
3/8" x 150mm
KLTL3.8.150EXTN

PTFE Thread tape
CT

Cordless drill



1¼" to 2" poly pipe cutters
(or hacksaw)

Water

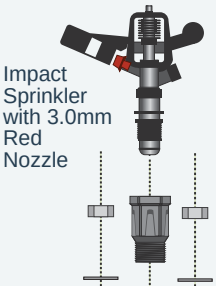
Measuring wheel
or 50m tape(s)

Marker flags

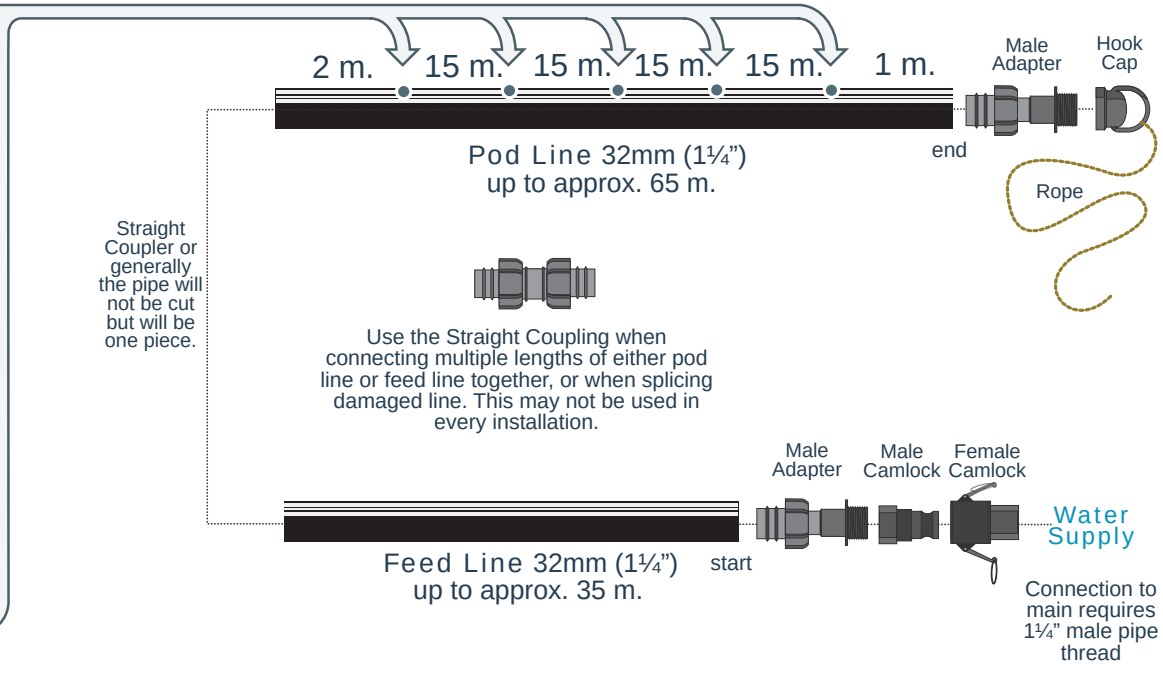
20mm wrench
**(optional)**

30mm wrench
**(optional)**

# STEP 4: **K-Line System Overview**



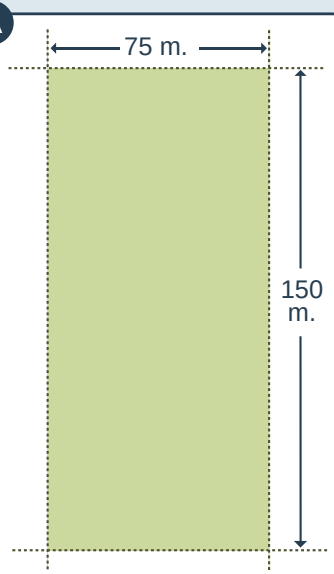

Pod Set Up (x 5)



# STEP 5: **Plan your 5 Pod / 1 hectare System Layout ***

Field shapes and dimensions may not match this ideal layout. K-Line's signature flexibility allows for adaptation to other field dimensions. See the additional "Sample Designs" at the end of this manual.

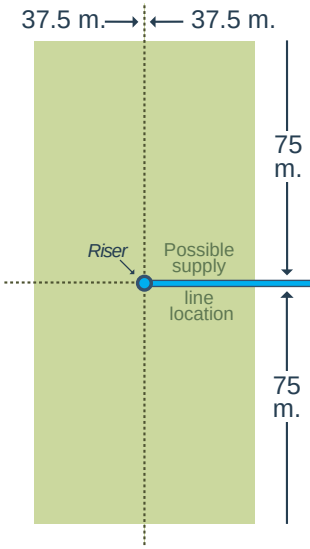
**A**




Determine the area of the field to be irrigated.

Up to approx. 1.0 hectares.

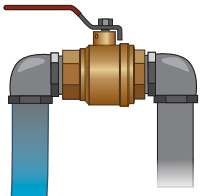
**B**




Determine the center of the field. This is the location of the riser.

**C**

Determine the supply line route from the water supply to the center of the field. The water supply line should be 1¼" or larger from the water source, beginning at a point where sufficient flow rate and pressure are available.



Possible supply line location

Water Supply
2,500-5,250 litres per hour
@ 250kPa - 350kPa

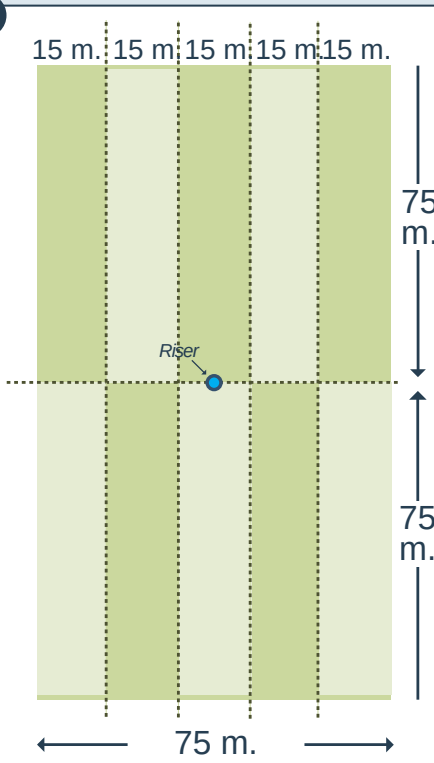
Varies depending on nozzle size

**D**

Consider your supply line. Supply line options include:

1. Buried (underground) PVC or polyethylene plastic pipe.
2. Lay-flat tubing (above ground), similar to fire hose, available from your irrigation dealer.
3. K-Pipe™ Irrigation tubing (above ground). K-Pipe is highly durable and specifically formulated to remain flexible, is freeze resistant, and has excellent UV resistance.

**E**




Determine Shift/Set Widths.

Shift/Set widths are recommended to be between 12 m. and 15 m.

The material included in this kit allows for a field length of up to 150 m.

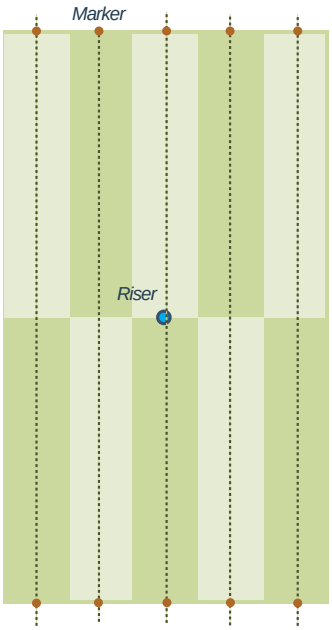
The field width should not exceed 75m for this 5 Pod/ 1 hectare K-Line Irrigation kit.

K-Line's great flexibility of design allows for numerous options in laying out a field. K-Line is adaptable in its ability to have more than one riser location. Sprinkler/pod lines can be curved to adjust to field shapes, obstacles, or terrain. Sprinkler nozzles are easily changed for adjusting application rates. Shifting more than once per day allows a larger area to be covered quickly. Extended irrigation sets can apply that long, slow rain that fills the soil profile and encourages a stronger, deeper and more efficient, and resilient, root system.

We have included many examples in our **"Sample Designs"** that are included in this kit to help identify irrigation opportunities for your situation. Call your K-Line supplier for any questions.

**F**

Once a field design has been decided and the riser location(s) have been located, another consideration is the placement of markers at the ends of the area to be irrigated to aid in shifting the K-Line.



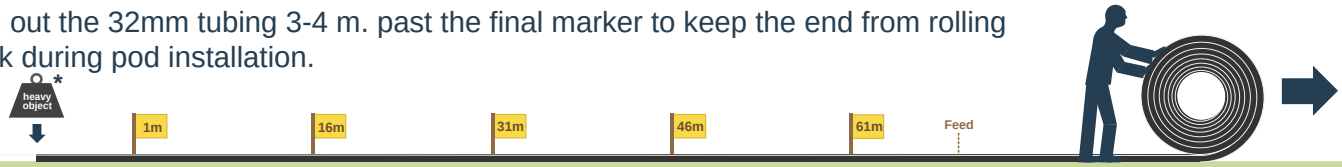

Placement of markers at the end of the field (in the center of each Set width – see the Diagram to the right) gives the operator a target to aim for when shifting the K-Line (especially beneficial when becoming accustomed to shifting the K-Line or in irregularly shaped fields).

Markers are often brightly colored (fluorescent yellow, orange, or red) streamers that can be attached to a fence; or orange Tri-Stakes that offer excellent visibility.

# STEP 6: **5 Pod / 1 hectare Layout of the Pod Line**

## A Rolling out the Pod Line

Roll out the 32mm tubing 3-4 m. past the final marker to keep the end from rolling back during pod installation.

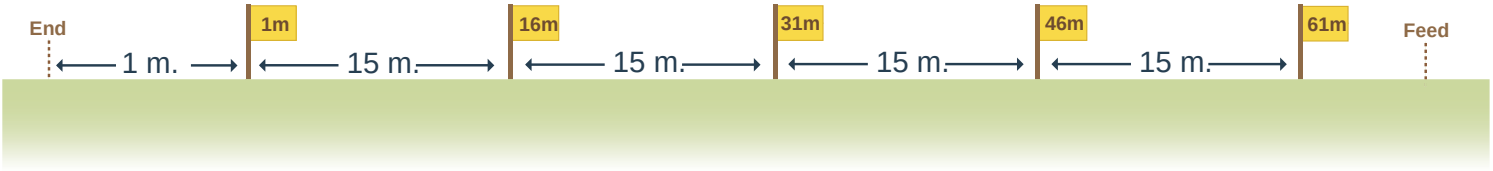



DO NOT ALLOW IT TO TWIST! The triple white line should face up for the entire length of the tubing.

*Hint: It helps to put a heavy object on the ends of the K-Line Tubing when rolling it out to keep the tubing in place and prevent it from rolling up behind you. The tubing will relax once rolled out and allowed to sit in the sun.

## B Measuring pod placement

Using the metre marking on the pipe, starting at 1 metres and then at 15 metre intervals.



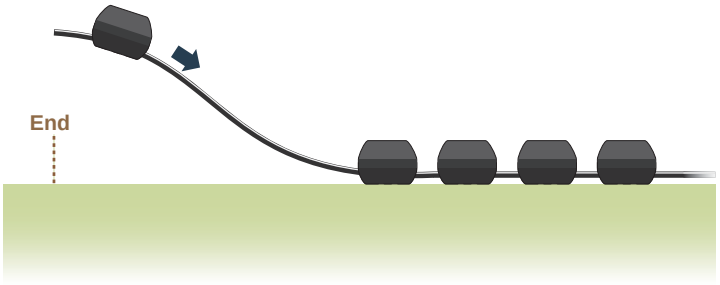

Note: Sprinkler/pod spacing is determined by field length and may differ if your area to be irrigated is less than 130m. For the K-Line 5 Pod/1 hectare Irrigation Kit, K-Line recommends spacing up to 15m. Dealer engineered K-Line layouts are usually between 12m and 15m.

If you need assistance, call your supplier or contact RX Plastics sales@rxplastics.co.nz.

# STEP 7: **Placing the pods**

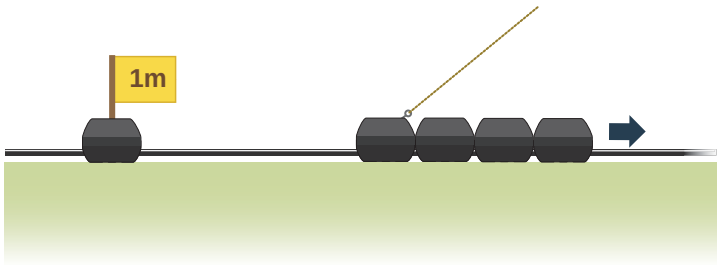
## A

Slide the 5 pods onto the K-Line tubing.



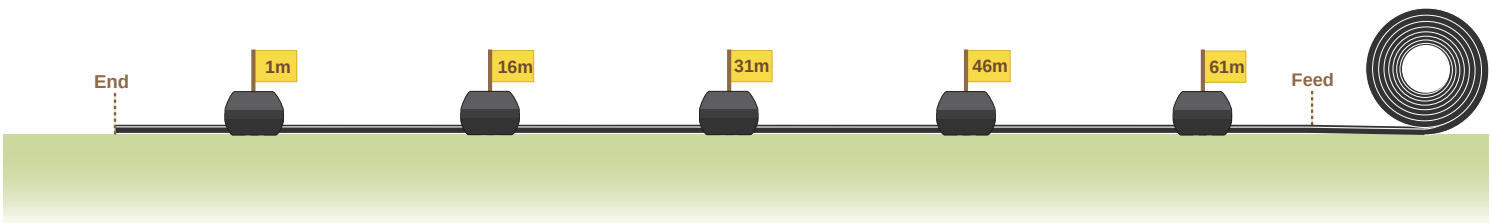

## B

Use the Tow Rope and Hook to pull all 5 pods to the first marker. Unhook a pod, leaving it at the marker.




## C

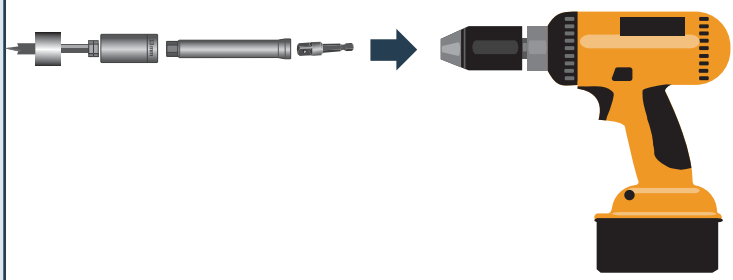
Continue on to the remaining markers, leaving a pod at each.



# STEP 8: **Tapping Saddle Installation**

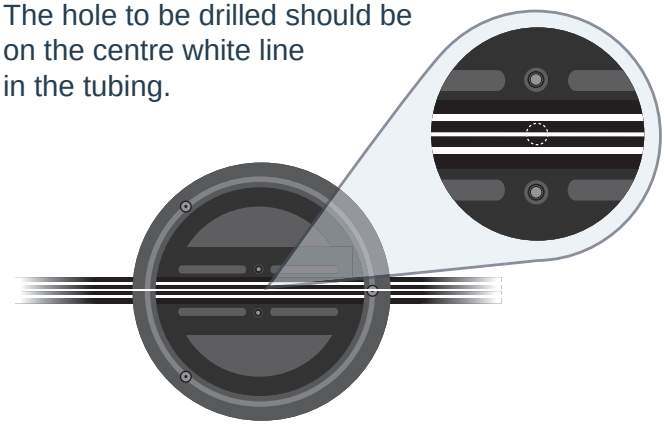
**A**

Install the included K-Line spade drill bit w/limiter into a 13mm deep socket, extension and drill adaptor into a cordless drill.



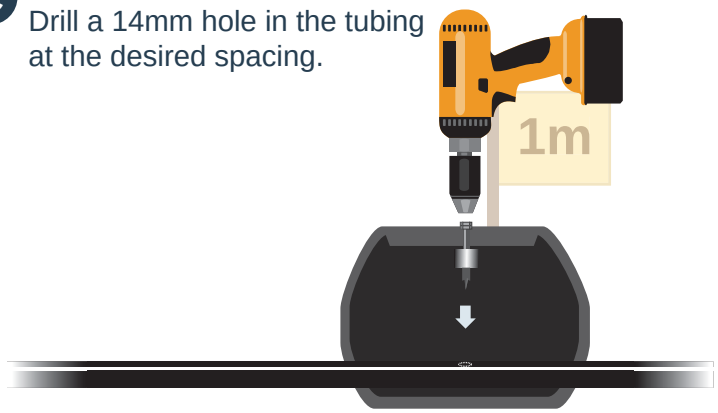
**B**

The hole to be drilled should be on the centre white line in the tubing.



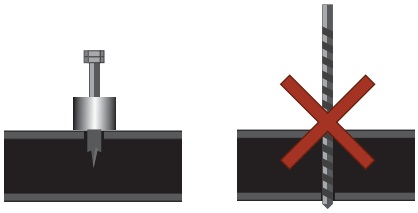
**C**

Drill a 14mm hole in the tubing at the desired spacing.




**D**

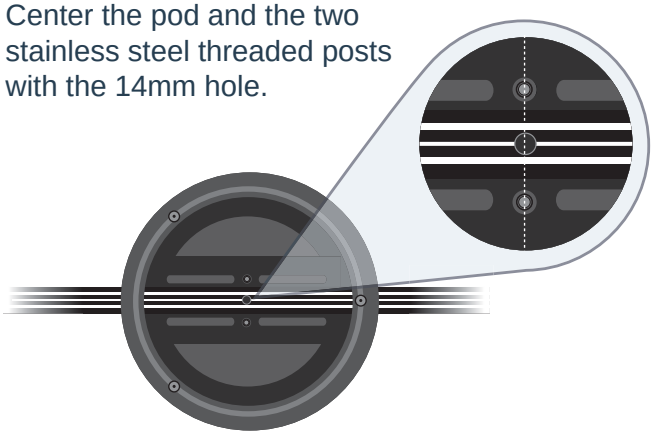
Caution: **Do not use a 3rd party drill bit.**
The K-Line Bit has a limiter attached to it to prevent the bit from being inserted too deeply and puncturing the opposite tubing wall.



After drilling, remove the tubing chaff from each hole.

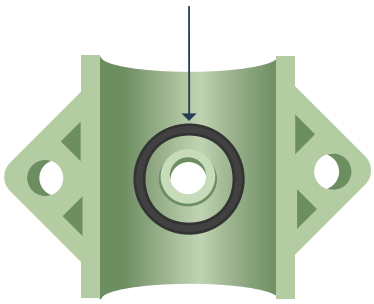
**E**

Center the pod and the two stainless steel threaded posts with the 14mm hole.



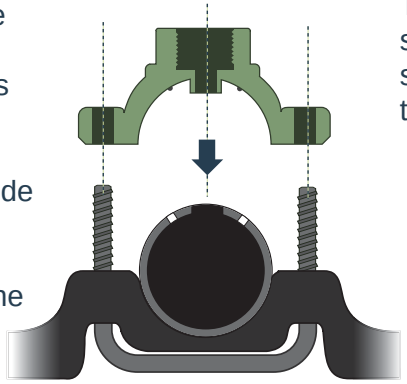
**F**

Make sure that the rubber O-ring is in the groove on the underside of the K-Line Tapping Saddle.

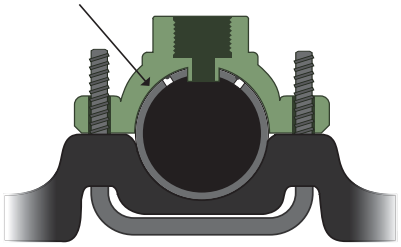


**G**

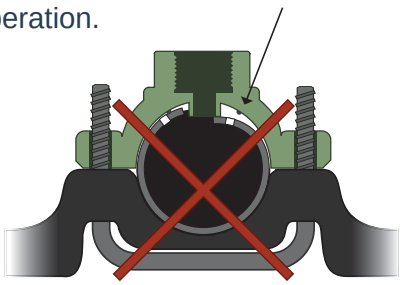
Push the K-Line tapping saddle down over the threaded posts and be certain that the nipple on the underside of the tapping saddle is inserted into the 14mm hole.



The K-Line tapping saddle should sit snugly over the tubing without a gap.



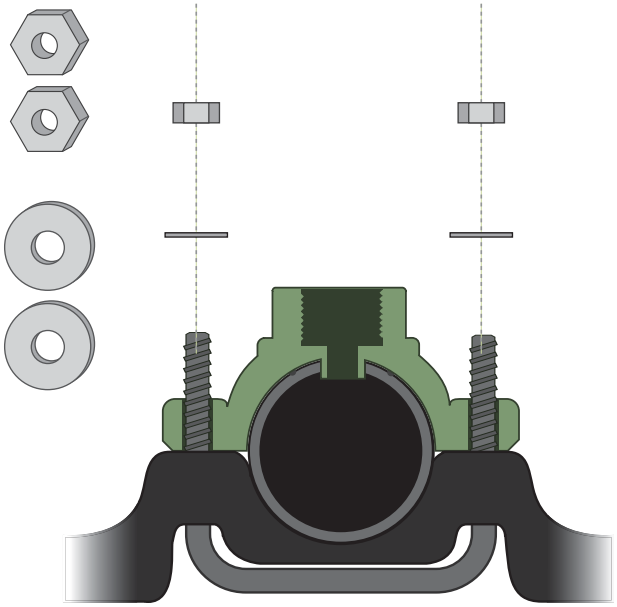
A gap might indicate that you are pinching the tubing on either side of the hole causing water to spray out into the pod during operation.



# STEP 8: **Tapping Saddle Installation** (continued)

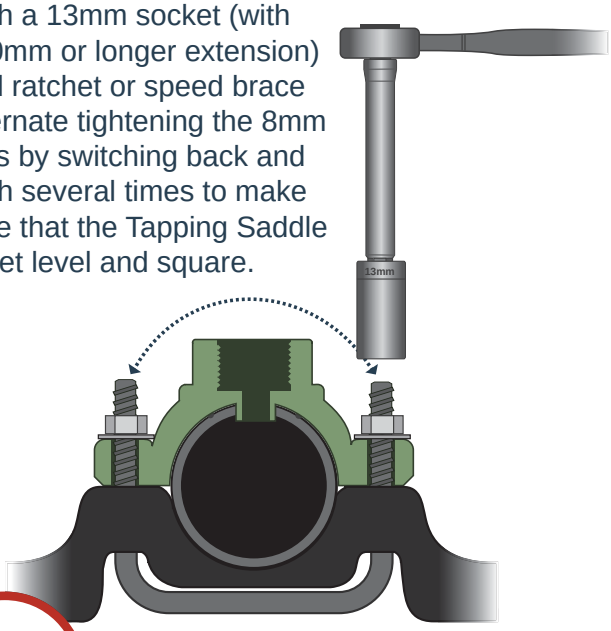
**H**

Put a stainless steel washer on each threaded post and then hand tighten a 8mm stainless steel nut onto each post.



**I**

With a 13mm socket (with 150mm or longer extension) and ratchet or speed brace alternate tightening the 8mm nuts by switching back and forth several times to make sure that the Tapping Saddle is set level and square.

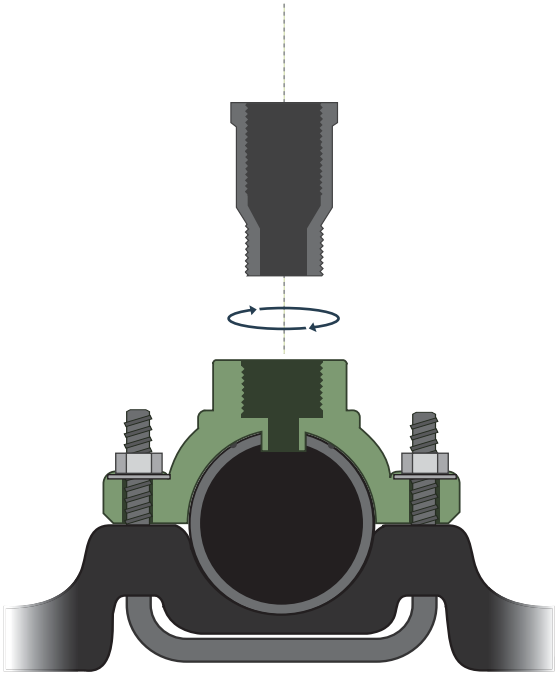



CAUTION: **Using a drill to tighten stainless steel materials can cause the stainless steel to heat up and seize, resulting in broken threaded posts or failure to fully tighten the nuts onto the Tapping Saddle.**

# STEP 9: **IMPACT Sprinkler Installation**

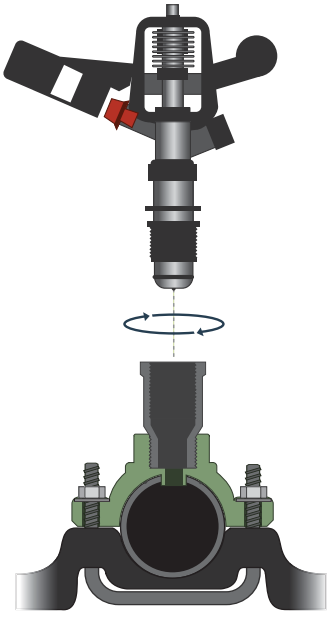
**A**

Hand start the adaptor into the K-Line tapping saddle (careful not to cross thread), then finish tightening with an adjustable wrench or channel lock pliers.



**B**

Hand start the impact sprinkler (careful not to cross thread), then finish tightening with a 20mm open ended wrench or channel lock pliers.



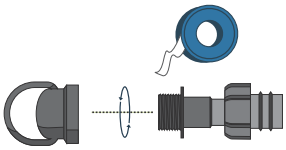
Repeat Steps 8 and 9 for each pod in the line.

# STEP 10: **K-Line Fittings Installation onto the Lines**

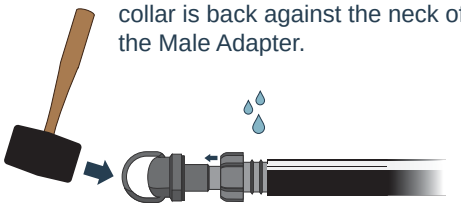
A

**Attach the Male Adapter and Hook cap to the end of the Pod Line, as follows:**

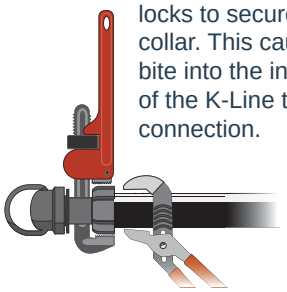
1. Assemble the Male Adapter and Hook cap together, using thread tape on the threads to seal the connection, and tighten with a pipe wrench and channel locks.*



2. Moisten the barbed end of the Male Adapter with water. Drive the Male Adapter and Hook cap into the K-Line Tubing with a rubber mallet ensuring that the collar is back against the neck of the Male Adapter.



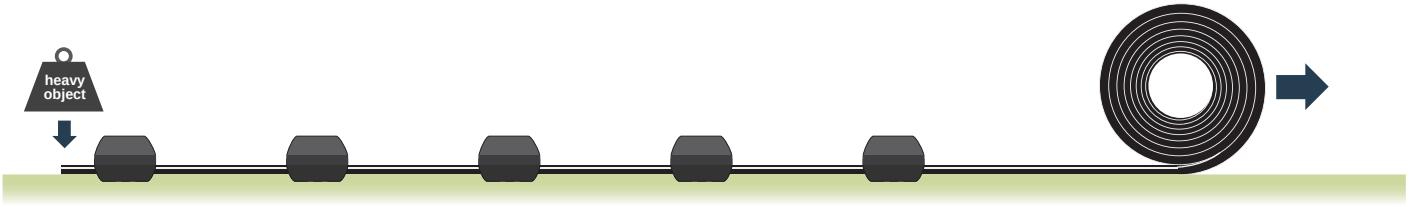
3. Hand tighten the collar of the Male Adapter onto the tubing, then finish by using a combination of pipe wrenches and channel locks to securely tighten the collar. This causes the barbs to bite into the interior and exterior of the K-Line tubing for a strong connection.



*Hook cap and Male Adapter may be preassembled

A

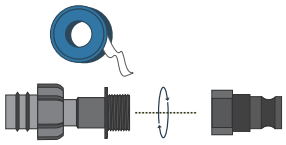
Roll out the remainder of the 32mm tubing, this will be the **Feed Line**. It should be approximately 35m if your area to be irrigated is 60m wide. If your area to be irrigated is less than 60m, then the **Feed Line** should be at least long enough to run from the riser in the center of the field to the edge of the field.



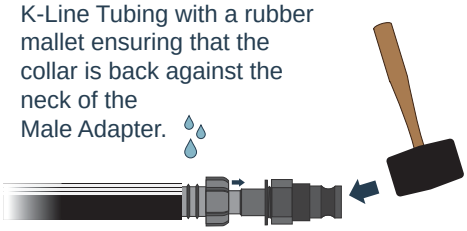

A

**Attach the Male Adapter and Male Camlock to the Start of the Feed Line, as follows:**

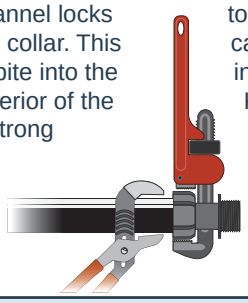
1. Assemble the Male Adapter and Hook cap together, using thread tape on the threads to seal the connection, and tighten with a pipe wrench and channel locks.*



2. Moisten the barbed end of the Male Adapter with water. Drive the Male Adapter and Hook cap into the K-Line Tubing with a rubber mallet ensuring that the collar is back against the neck of the Male Adapter.



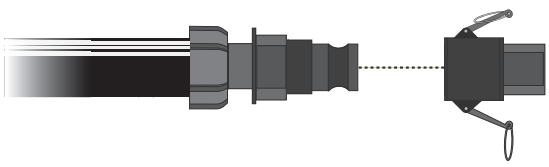
3. Hand tighten the collar of the Male Adapter onto the tubing, then finish by using a combination of pipe wrenches and channel locks to securely tighten the collar. This causes the barbs to bite into the interior and exterior of the K-Line tubing for a strong connection.



*Hook cap and Male Adapter may be preassembled

G

Attach the Male Camlock to the Water Supply Line using the supplied Female Camlock.




**This completes the K-Line installation.**

# K-Line Shifting

**Please also refer to the K-Line Installation DVD to learn how to shift the K-Line System.**

## Shifting from Set 1 to Set 2

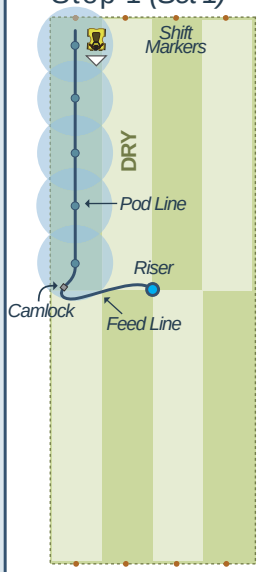
You can shift K-Line Irrigation with an ATV, heavy duty lawn tractor, golf cart, Gator, or similar tow vehicle. The preferred method of movement is while the sprinklers are in operation. This saves shifting time and the water pressure in the K-Line tubing helps prevent kinking.

### The two most important practices to follow when shifting:

**1. ALWAYS Shift on the "dry" side.** Always begin the shifting procedure on the dry (unirrigated) side of the K-Line. The "dry" (unirrigated) side of a K-Line is the side next to the section(s) of the field that have not been irrigated. This is opposed to the "wet" (irrigated) sections or "Sets" which have been irrigated previously. This will prevent "double loops" in the Feed Line and reduce chances that the tubing will get kinked. Please refer to the illustrations below and note that the "wet" (irrigated) and "dry" (unirrigated) Sets have been labeled.

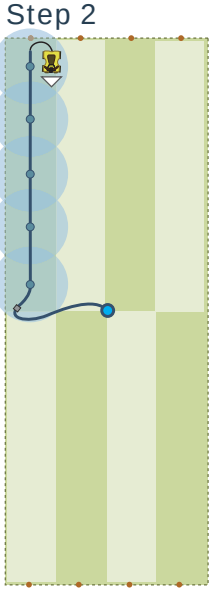
**2. When connecting to the K-Line,** always face towards mid-field and position the tow vehicle 2 - 2.5m from, and parallel to, the K-Line.

**Step 1** *(Set 1)*



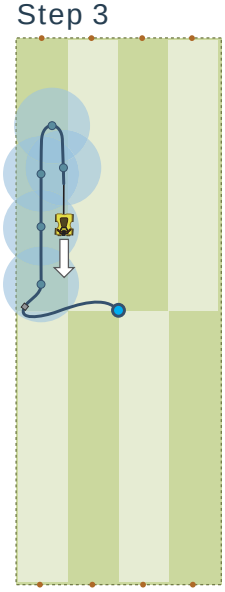

Facing the far end of the field, position your vehicle along side and 2 - 2.5m away from the sprinkler/pod line.

**Step 2**



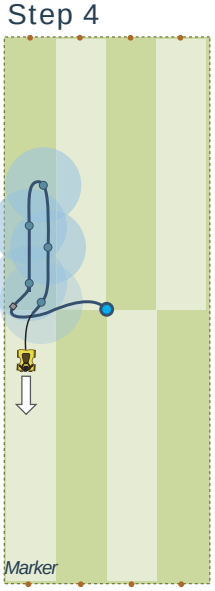
Attach the hook and rope at the end of the sprinkler/pod line to the tow vehicle.

**Step 3**



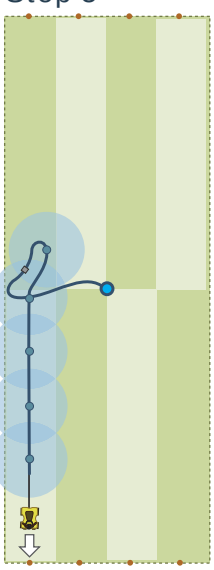
Drive along (parallel to) your sprinkler/pod line, staying within 2 - 2.5m of the line.

**Step 4**



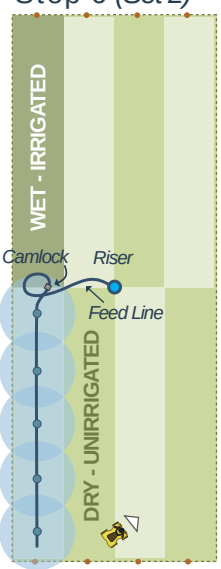

As you approach the midpoint of your field (running over the feed line), line up with your marker at the end of the field.

**Step 5**



Continue to the end of the field and stop when the first pod is approximately 8m from the end of the field.

**Step 6** *(Set 2)*

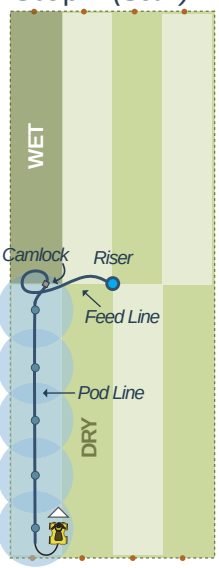



Unhook the sprinkler/pod line from your tow vehicle.

## Shifting from Set 2 to Set 3

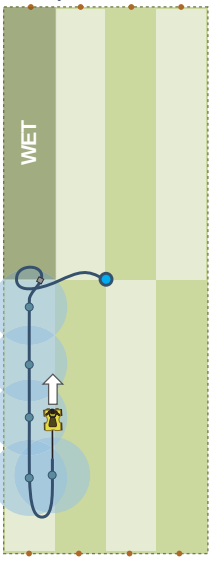
***The following steps show how to move the K-Line 15m over to the right for the next set.***

**Step 1** *(Set 2)*



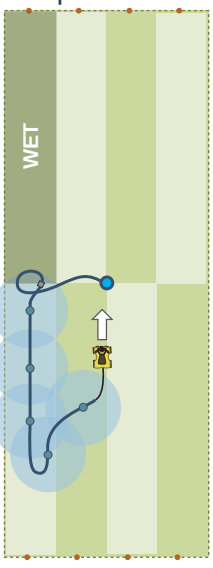

Position your vehicle as described above and hook the sprinkler/pod line to the tow vehicle.

**Step 2**



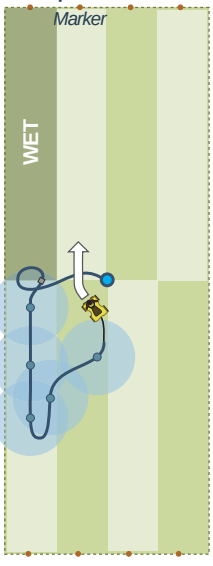

Pull straight forward until you reach the third pod.

**Step 3**



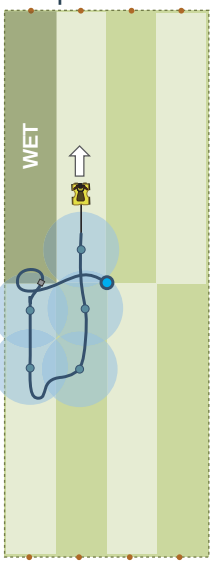

Veer right about 15m and straighten to align the vehicle with the end of the field.

**Step 4**



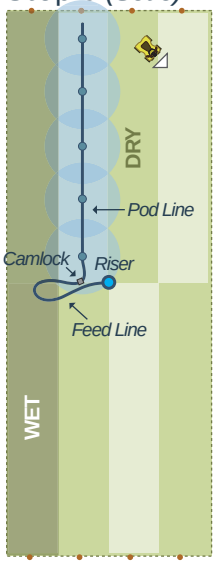

Before reaching the center line, veer back slightly to the left and line up with the marker at the end of the field .

**Step 5**




Pass over the feed line and continue to the end of the field.

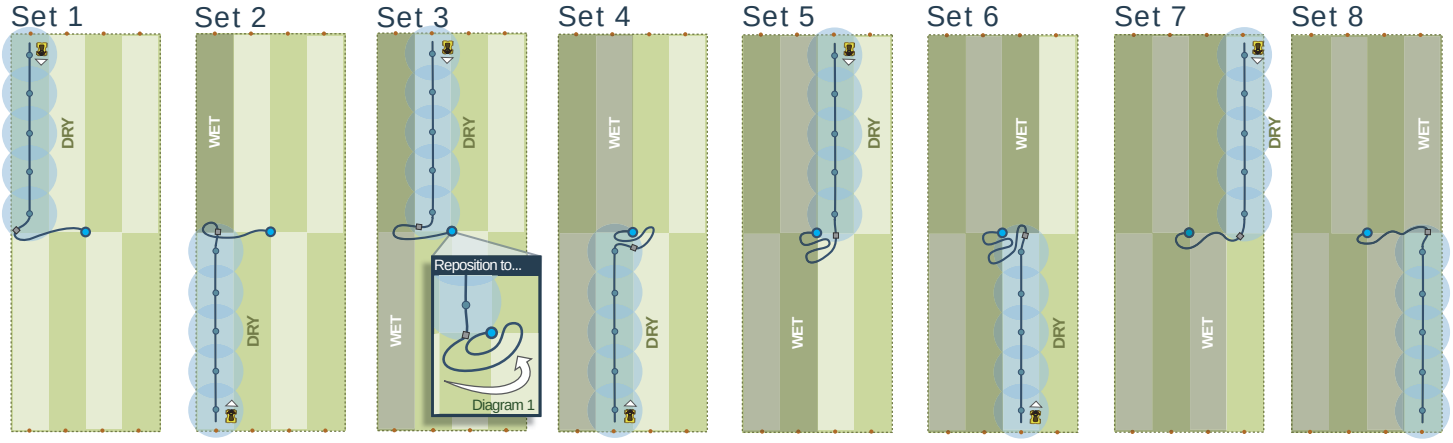
**Step 6** *(Set 3)*




Unhook the vehicle from the sprinkler/pod line.

Follow the steps above to shift the line to irrigate all the sections of the field.

# Example of a Complete Shifting Schedule




This is an example of the Sets and order of shifts to completely irrigate a field. For other field shapes and sizes please consult your K-Line dealer.

## Repositioning the Feed Line

You will need to reposition the Feed Line at least once (sometimes more often) as you shift from Set to Set. In this Shifting Schedule, after the 2nd shift, where the K-Line is positioned to irrigate Set 3, the operator must manually take hold of the Feed Line at the point of the loop furthest from the riser. Then, as shown in **Diagram 1**, the operator must pull the Feed Line loop to a point about 3-5m to the right of the riser at mid-field.

The operator may also need to reposition the Feed Line if they see that the first sprinkler/pod (the sprinkler/pod closest to the riser or mid-field) is out of alignment with the other pods.

In this Shifting Schedule, this is most likely to occur after shifting the K-Line to the Set 7 position. In this situation, just pull the Feed Line (near the Pod line) to reposition the sprinkler/pod and Feed Line. Once the operator becomes familiar with the shifting procedure, the need to reposition (as in Set 7) will be less often.

## K-Line Shifting Hints

To keep the final sprinkler (pod closest to the tow vehicle during shifting) from spraying the operator during shifting, use a clothes pin to prevent sprinkler movement, or a coffee can (or similar) over the sprinkler to redirect the spray. Remove after the K-Line has been shifted.

Always position the tow vehicle 2 - 2.5m from the K-Line to be shifted on the dry (unirrigated) side of the K-Line - SEE page **8-9**. This will prevent "double loops" in the Feed Line and reduce chances that the tubing will get kinked. Mark the ends of the field with large different colored markers or flags to help position your lines properly

The first sprinkler/pod may be out of line with the rest of the sprinklers/pods if you have not positioned the last pod (the sprinkler/pod furthest from mid-field) approximately 8m from the edge of the field; OR if the Feed Line needs to be repositioned (as after moving the K-Line to the Set 3 or Set 7 positions – see above, Repositioning the Feed Line, for more details).

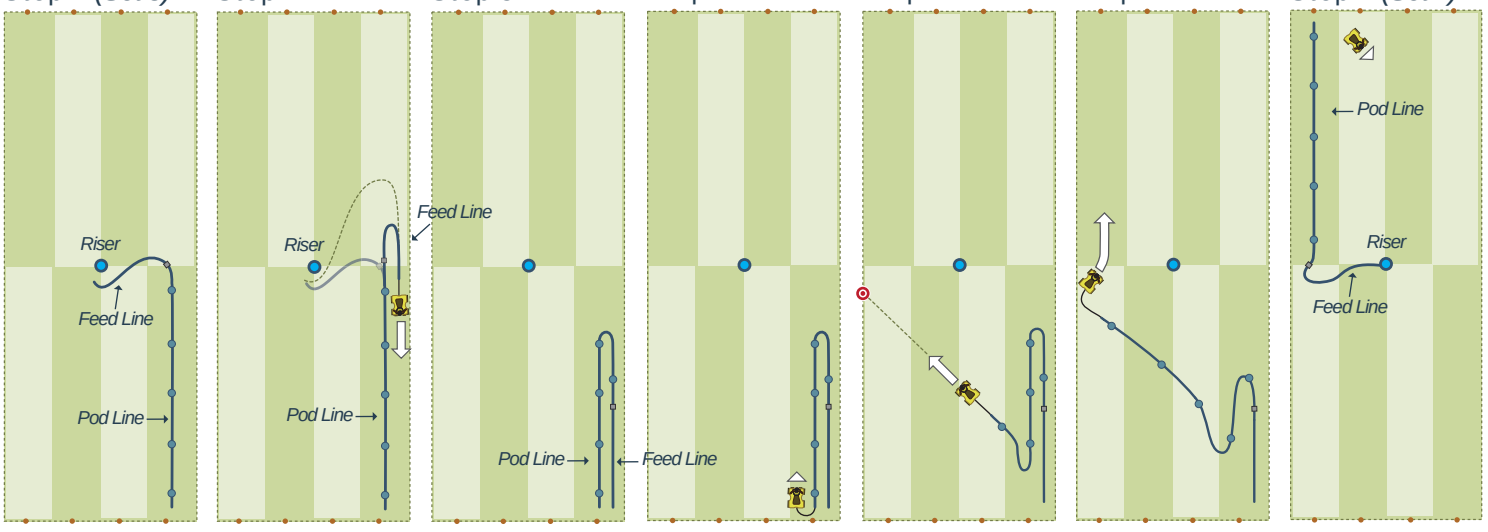
Shifting K-Line in hot weather without water running through the tubing increases the chance of kinking. EITHER shift the line while irrigating, OR shift (without water running) in the early morning or early evening when the tubing is cool.

## End of Season

Unhook the Feed Line and K-Line from the riser and shift it to the side of the field for storage or during harvest. Setting the K-Line on an incline, and the action of shifting the K-Line itself, will remove most of the water from the K-Line. K-Line tubing will also stretch slightly to withstand some freezing. Open all riser and drain valves to drain the system and cover any open risers or tubing ends (cam dust caps and plugs are available) to prevent small animals from nesting inside.

If a significant amount of grass is allowed to grow up and entangle the K-Line (i.e., from autumn through to late spring when you begin irrigating again) then be sure to manually loosen the pods from the grip of the weeds before shifting the K-Line.

# Resetting the System from Set 8 to Set 1




**Step 1** *(Set 8)*: Turn off the water. Disconnect the Feed Line from the riser.

**Step 2**: Begin to reposition the Feed Line by making a wide arc away from the pod line and moving to the far side, and 2 - 2.5m from the pod line.

**Step 3**: Reposition the Feed Line to run parallel to the pod line (on the far side of the field). The cam fitting that connects to the riser should be near the hook cap.

**Step 4**: Position your vehicle along side and 2 - 2.5m from the sprinkler/pod line facing the far end of the field. Hook the sprinkler/pod line to the tow vehicle.

**Step 5**: Pull forward to the second pod, then angle left aiming for a point short of the center of the far side of the field.

**Step 6**: Drive to the edge of the far side of the field. Before passing the center line, turn back and position yourself in the middle of Set 1.

**Step 7** *(Set 1)*: Continue to the end of the field. Unhook the sprinkler/pod line from the tow vehicle. Reposition the Feed Line and reconnect the Feed Line to the riser.

# K-Line Trouble Shooting Guide

| Symptom | Possible Cause / Solution |
|---|---|
| **Partial or poor distribution from sprinkler** | ▪ plugged nozzle - remove nozzle, check for obstruction.<br>▪ obstruction in tubing - remove hook cap and flush line<br>▪ improper pump pressure - check pump<br>▪ damaged tubing leaking water - make square cuts to remove the damage, install Straight Coupling as described on page **6**, **STEP 11C**<br>▪ saddle improperly mounted on tubing - remove and mount according to pages **4 and 5, STEP 8** |
| **Pods rolling over during shifting** | ▪ towing vehicle is too far from K-Line - keep 2 - 2.5m from the pod line while shifting |
| **Connectors coming loose** | ▪ improper tightening of the K-Line connectors - cut off and discard 80mm of old scarred tubing when repairing (make sure that you have a square cut), then use pipe wrenches to more firmly tighten the connectors - see page **6, STEP 10A.** If this fails, replace fitting with new fitting with sharp edges. |
| **Water Stream hits the inside of the pod** | ▪ tapping saddle is improperly tightened down - reposition tapping saddle and tighten down evenly, see pages **4 and 5, STEP 8** |
| **Feed Line loop gets too tight** | ▪ Feed Line needs to be repositioned - see page **9, "Repositioning the Feed Line"**<br>▪ Feed Line is too short - add more tubing or narrow the width of the irrigated area |
| **K-Line tubing gets kinked** | ▪ failure to reposition Feed Line – see page **9, "Repositioning the Feed Line"** -<br>▪ shifting the K-Line without water running when temperatures are hot -<br>-straighten the kinked K-Line tubing and use a rubber mallet to lightly pound the tubing back into shape |

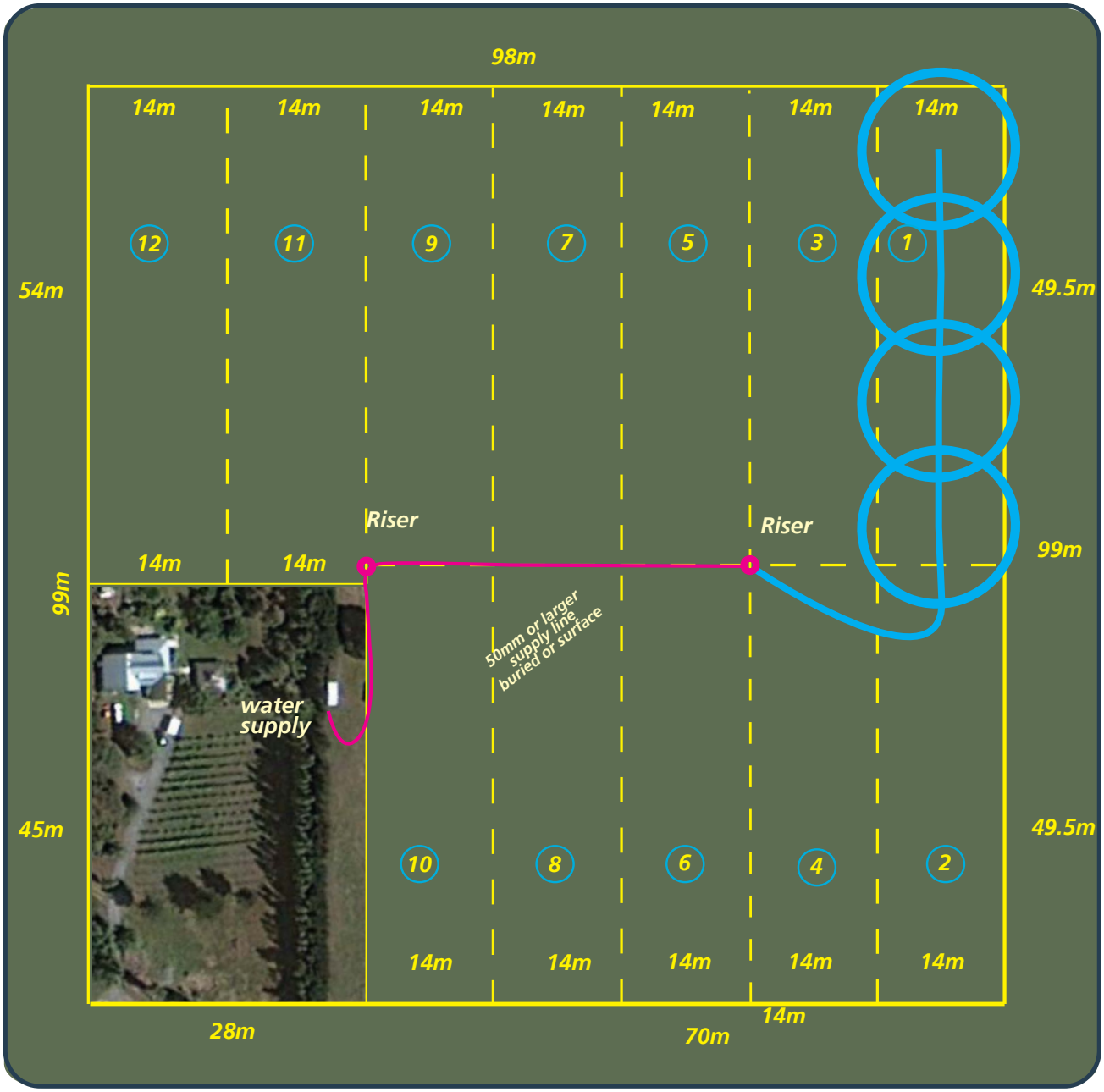
# Performance Chart

## 1 Hectare K-Line Irrigation Kit # Impact sprinkler options with 15m between sprinklers and a 15m shift width

| Nozzle Color & Size | Operating Pressure | Output per Sprinkler (litres per hour) | Total Water Required for 5 Sprinklers | Water Application Rate mm/Hour | Total Applied Water in 24 hr. Set | Average Application Rate Per Week Based on 8 Shifts with Continuous Running |
|---|---|---|---|---|---|---|
|  Orange - 2.8mm | 250 kPa. | 0.504 m³/hr | 2.52 m³/hr | 1.9 mm | 54 mm | 47 mm |
| | 270 kPa. | 0.524 m³/hr | 2.62 m³/hr | 2.0 mm | 56 mm | 48 mm |
| | 300 kPa. | 0.550 m³/hr | 2.75 m³/hr | 2.1 mm | 59 mm | 51 mm |
|  Red - 3.0mm | 250 kPa. | 0.576 m³/hr | 2.88 m³/hr | 2.2 mm | 61 mm | 53 mm |
| | 270 kPa. | 0.598 m³/hr | 2.99 m³/hr | 2.3 mm | 64 mm | 55 mm |
| | 300 kPa. | 0.630 m³/hr | 3.15 m³/hr | 2.4 mm | 67 mm | 58 mm |
|  Black - 4.0mm | 250 kPa. | 0.962 m³/hr | 4.81 m³/hr | 3.7 mm | 103 mm | 89 mm |
| | 270 kPa. | 0.998 m³/hr | 4.99 m³/hr | 3.8 mm | 106 mm | 93 mm |
| | 300 kPa. | 1.048 m³/hr | 5.24 m³/hr | 4.0 mm | 112 mm | 97 mm |
| **The green and blue nozzles below are optional sprinkler nozzles available from a K-Line™ Dealer** | | | | | | |
|  Green - 3.2mm | 250 kPa. | 0.642 m³/hr | 3.21 m³/hr | 2.5 mm | 69 mm | 60 mm |
| | 270 kPa. | 0.668 m³/hr | 3.34 m³/hr | 2.6 mm | 71 mm | 62 mm |
| | 300 kPa. | 0.706 m³/hr | 3.53 m³/hr | 2.7 mm | 75 mm | 65 mm |
|  Blue - 3.5mm | 250 kPa. | 0.742 m³/hr | 3.71 m³/hr | 2.8 mm | 79 mm | 69 mm |
| | 270 kPa. | 0.770 m³/hr | 3.85 m³/hr | 3.0 mm | 82 mm | 71 mm |
| | 300 kPa. | 0.812 m³/hr | 4.06 m³/hr | 3.1 mm | 87 mm | 75 mm |

# Sample Design 1: **One K-Line 5 Pod / 1 Hectare Kit**

2 Shifts a day, uses 4 sprinkler pods




## Design Specifications

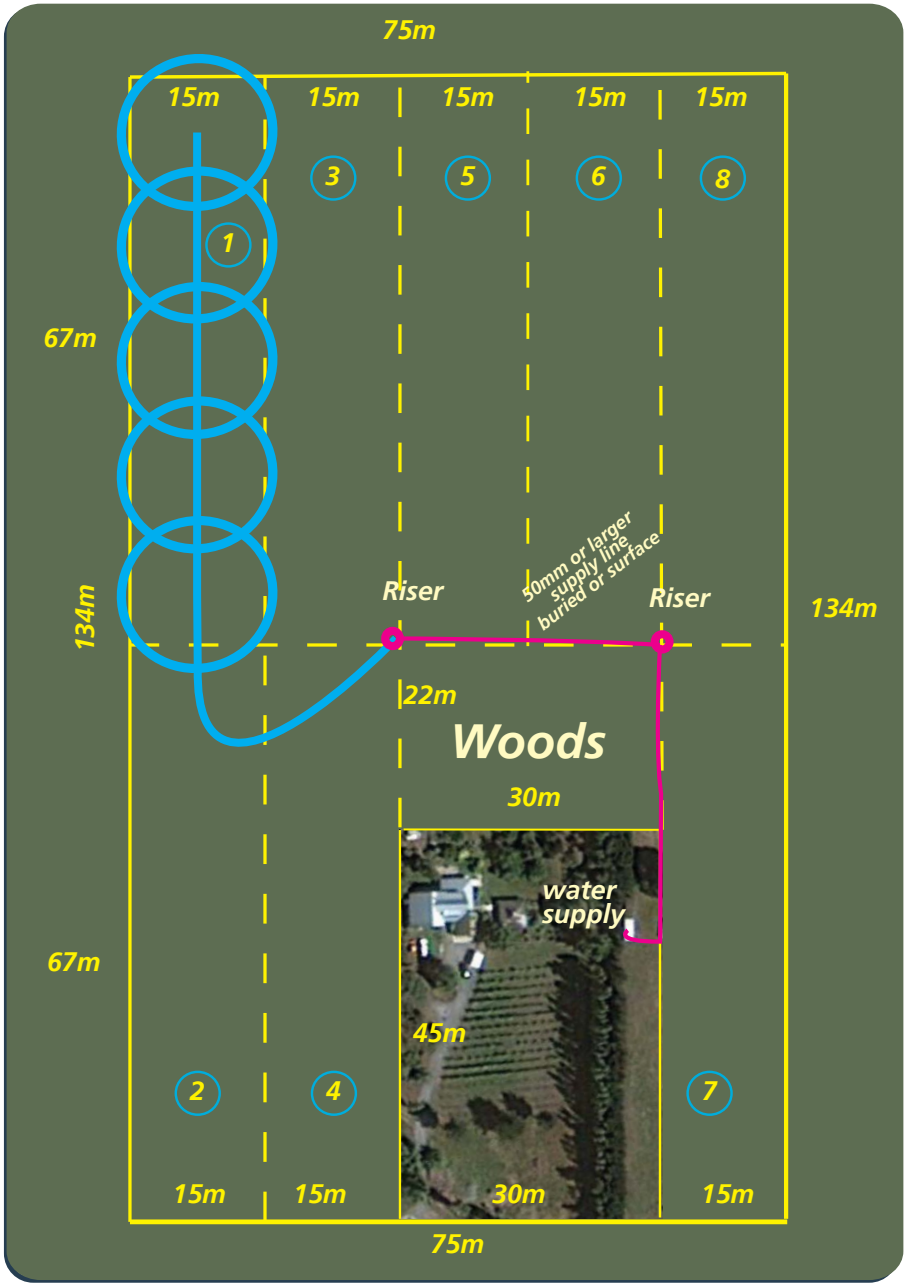
| | |
|---|---|
| Size of total area to be irrigated | **0.85 Hectares** |
| Number of sets or watering days required | **12 Sets in 6 days** |
| Distance between sprinkler pods | **12.4 m.** |
| Set widths | **14 m.** |
| Sprinkler nozzle color and size | **Orange 2.8mm** |
| Operating pressure available | **330 kPa** |
| Sprinkler application rate in mm per hour | **3.2 mm/hr** |
| Length of watering time per set | **10 hours** |
| Total amount of irrigation water applied during each set period | **31.4 millimetres** |
| System capability in mm per week applied | **44** |
| Number of sprinkler pods per K-Line | **4** |
| Output per sprinkler | **550 litres/hr** |
| Total cubic metres per hour (1000's litres) needed for this area | **2.2 m³/hr** |

## Notes

This layout uses only 4 pods of the kit, but there are two 10 hour shifts per day. By using the smaller orange 2.8mm sprinkler nozzle, this entire area can be covered in 6 days and still apply over 30mm of water per set.

# Sample Design 2: **One K-Line 5 Pod / 1 Hectare Kit**

Shifting once per day




## Design Specifications

| | |
|---|---|
| Size of total area to be irrigated | **0.8 Hectares** |
| Number of sets or watering days required | **8 days** |
| Distance between sprinkler pods | **13.4 m.** |
| Set widths | **15 m.** |
| Sprinkler nozzle color and size | **Orange 2.8mm** |
| Operating pressure available | **320 kPa** |
| Sprinkler application rate in mm per hour | **2.8 mm/hr** |
| Length of watering time per set | **12 hours** |
| Total amount of irrigation water applied during each set period | **32.9 mm** |
| System capability in mm per week applied | **57.6 mm** |
| Number of sprinkler pods per K-Line | **5** |
| Output per sprinkler | **560 litres/hour** |
| Total cubic metres per hour (1000's litres) needed for this area | **2.8 m³/hr** |

## Notes

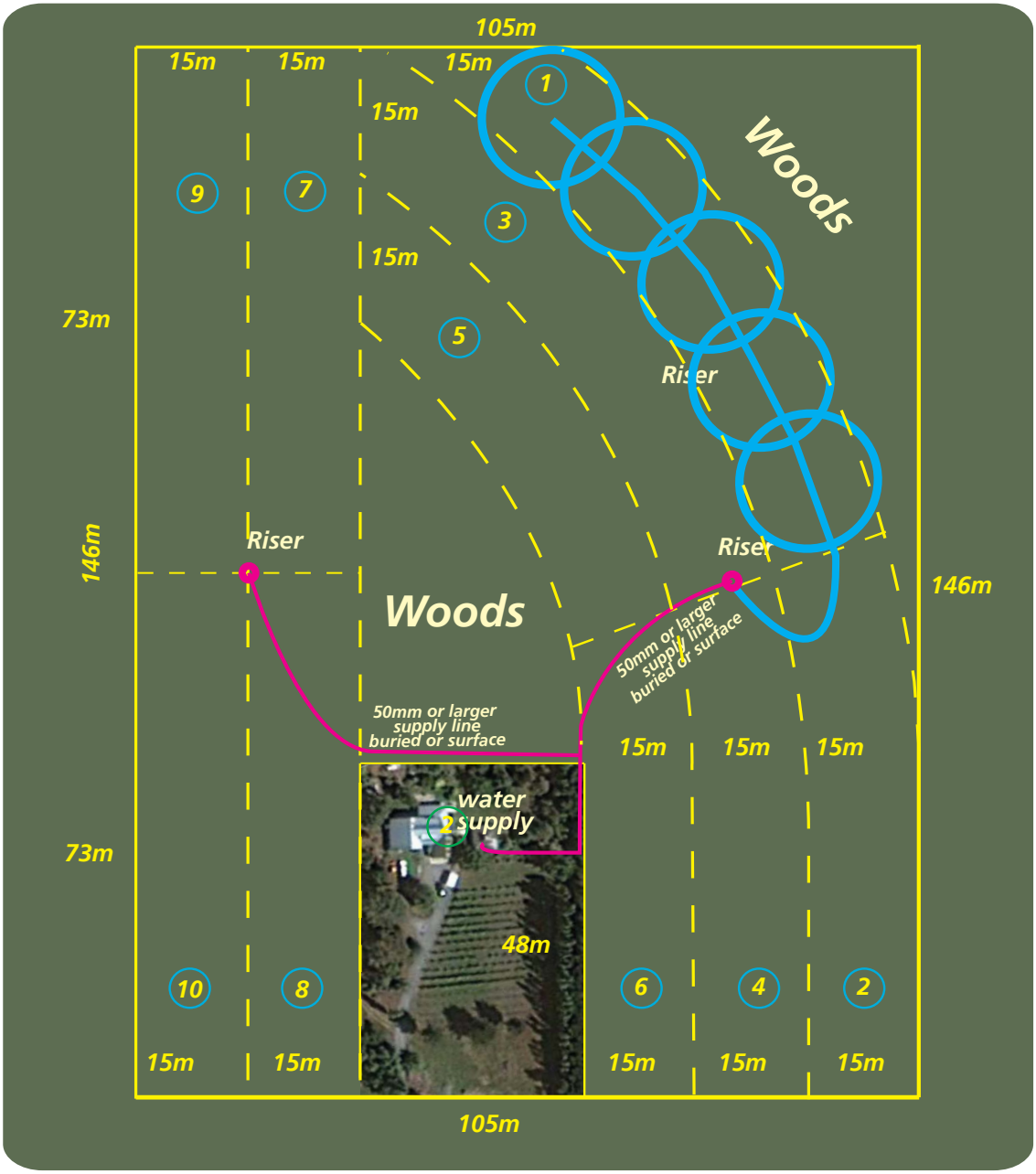
**To move the K-Line from Set 5 to Set 6:** Shut off the water, then disconnect the Feed Line from the Pod Line at the Cam Fitting. Next, shift the K-Line from Set 5 first into the Set 7 area and then immediately return to Set 6 with the Pod Line. Move the Feed Line to Riser 2. Reconnect to the Pod Line and restart the water.

**To move the K-Line from Shift 1 to Shift 8:** Use a similar procedure as described above by temporarily using the Set 2 area to line up the K-Line Pod Line.

In this layout, either the orange or red nozzle could be used to match the available water.

# Sample Design 3: **One K-Line 5 Pod / 1 Hectare Kit**

Shifting once per day



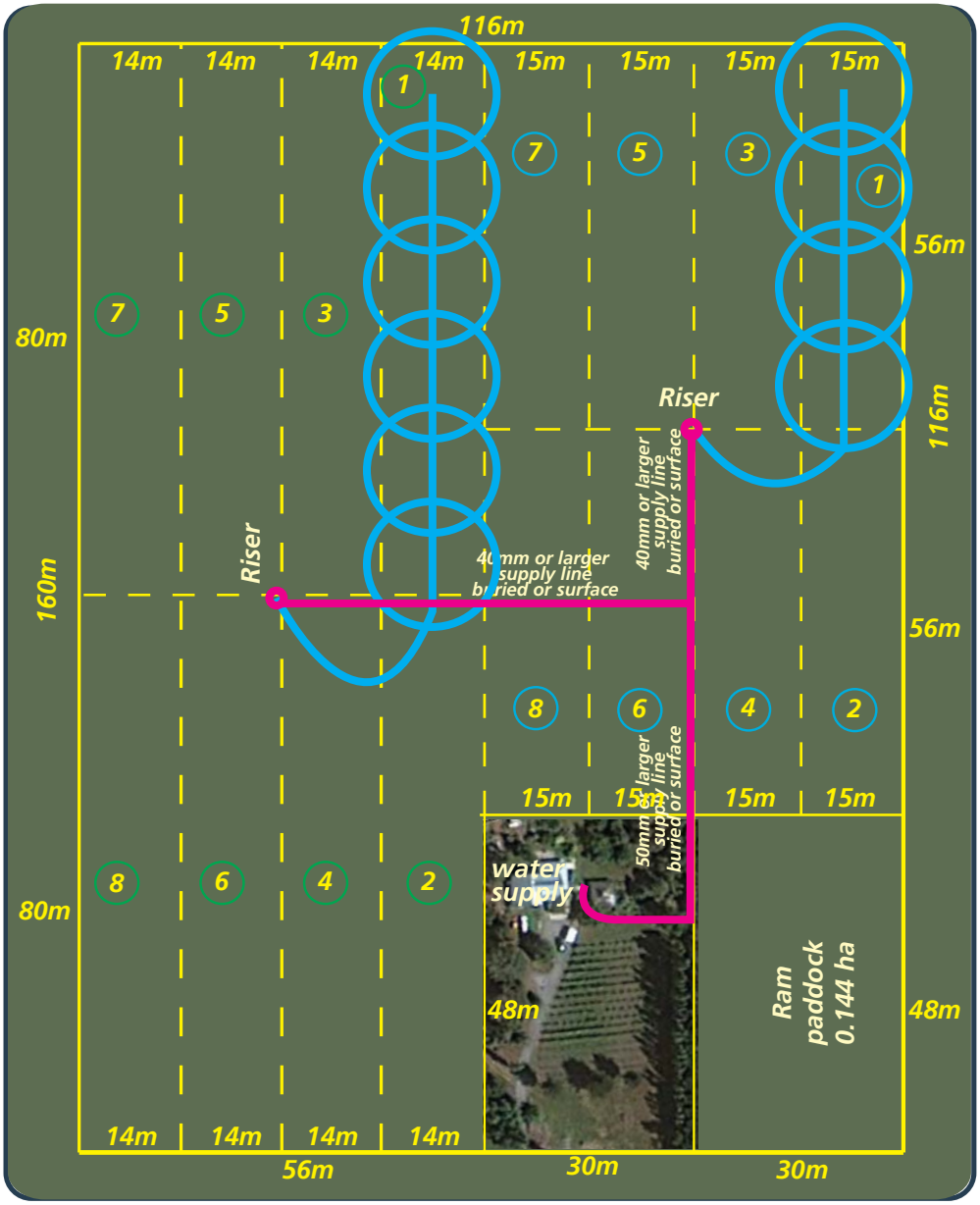

## Design Specifications

| | |
|---|---|
| Size of total area to be irrigated | **1.1 Hectares** |
| Number of sets or watering days required | **10 days** |
| Distance between sprinkler pods | **14.6 m.** |
| Set widths | **15 m.** |
| Sprinkler nozzle color and size | **Orange 2.8mm** |
| Operating pressure available | **320 kPa** |
| Sprinkler application rate in millimetres per hour | **2.6 mm/hr** |
| Length of watering time per set | **12 hours** |
| Total amount of irrigation water applied during each set period | **30 mm** |
| System capability in millimetres per week applied | **42mm** |
| Number of sprinkler pods per K-Line | **5** |
| Output per sprinkler | **560 litres/hour** |
| Total cubic metres per hour (1000's litres) needed for this area | **2.8m³/hr** |

## Notes

K-Line works easily around curves or other obstacles. On soil with good water holding capacity, the shift rotations can be increased by using additional riser locations. In the plan, the area irrigated would be completed in 10 day rotations.

# Sample Design 4: **Two K-Line 5 Pod / 1 Hectare (Ex) Kits Combined** Shifting once per day




## Design Specifications

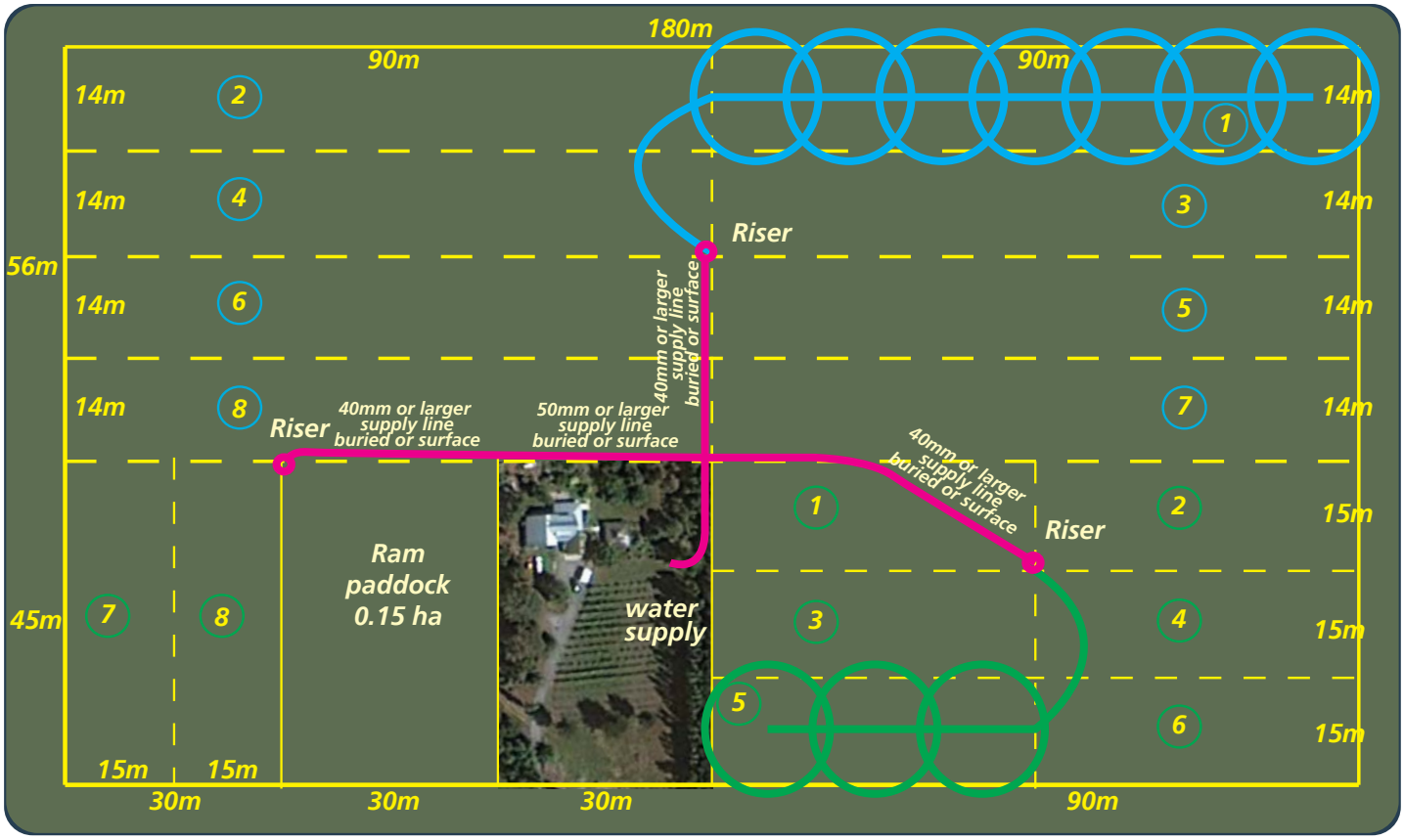
| | 1 — 8 | 1 — 8 | Totals |
|---|---|---|---|
| Size of total area to be irrigated | 0.69 Ha | 0.94 Ha | 1.63 Ha's |
| Number of sets or watering days required | 8 days | 8 days | 8 days |
| Distance between sprinkler pods | 14 m. | 13.33m | |
| Set widths | 15 m. | 14 m. | |
| Sprinkler nozzle color and size | Red 3.0mm | Orange 2.8mm | |
| Operating pressure available | 330 kPa | 330 kPa | 330kPa |
| Sprinkler application rate in mm per hour | 3 mm/hr | 3 mm/hr | 3mm/hr |
| Length of watering time per set | 12 hours | 12 hours | 12 hours |
| Total amount of irrigation water applied during each set period | 36mm | 36mm | 36mm |
| System capability in millimetres per week applied | | | 63mm |
| Number of sprinkler pods per K-Line | 4 | 6 | 10 |
| Output per sprinkler | 620 litres/hour | 560 litres/hour | |
| Total cubic metres per hour (1000's litres) needed for this area | 2.2m³/hr | 3.8m³/hr | 6.0m³/hr |

## Notes

Both K-Line sprinkler pod lines are operating at the same time.

By dividing the total parts from 2 K-Line 5 Pod Kits into a 6 sprinkler pod line and a 4 sprinkler pod line and then operating both K-Lines at the same time, a little over 1.5 hectares can be irrigated, applying about 36mm of water per set. This is designed for an 8 day rotation.

# Sample Design 5: **Two K-Line 5 Pod / 1 Hectare (Ex) Kits Combined** Shifting once per day



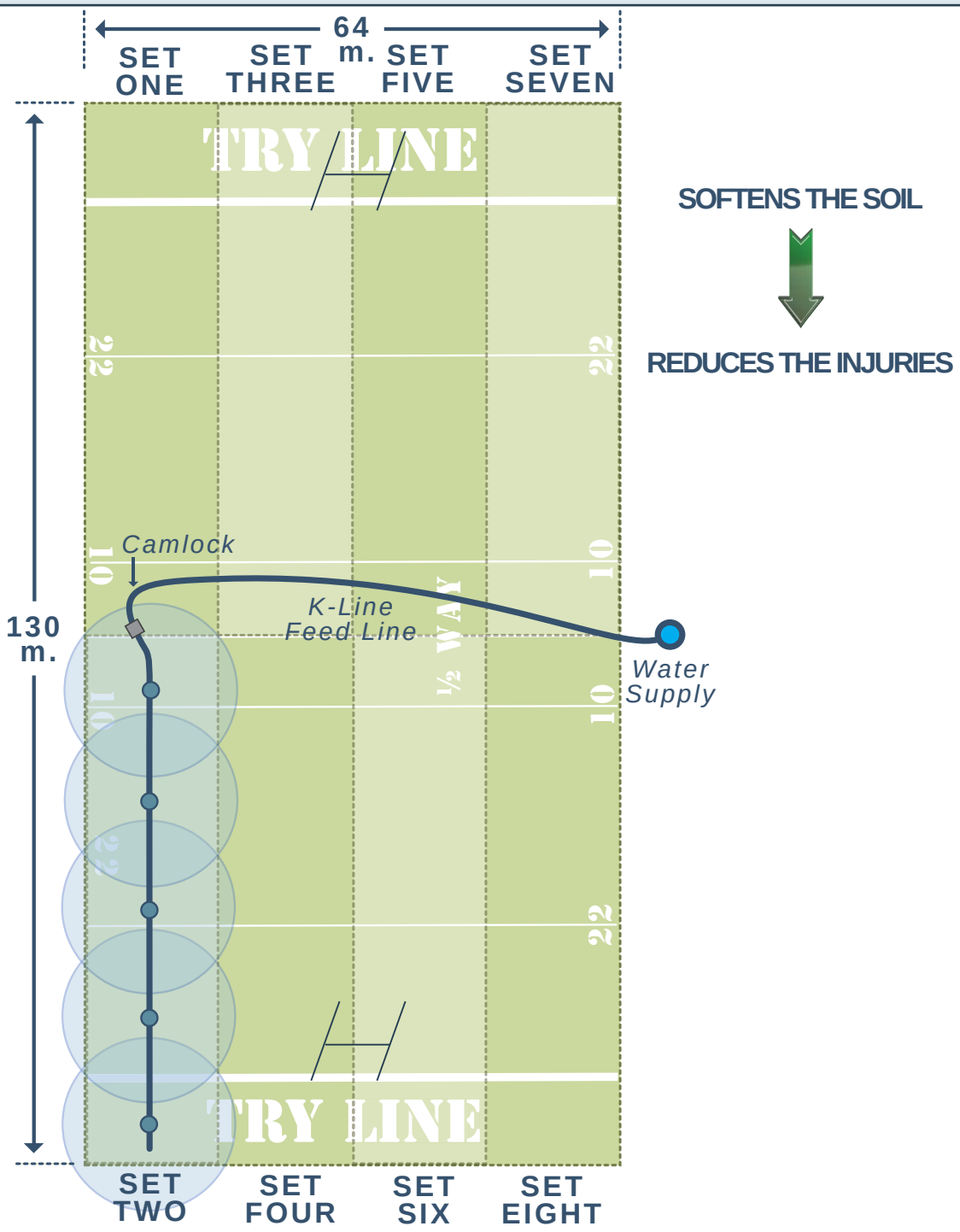

## Design Specifications

| | 1–8 | 1–8 | Totals |
|---|---|---|---|
| Size of total area to be irrigated | 1.1 Ha | 0.56 Ha | 1.66 Ha's |
| Number of sets or watering days required | 8 days | 8 days | 8 days |
| Distance between sprinkler pods | 12.86 m. | 15 m. | |
| Set widths | 14 m. | 15 m. | |
| Sprinkler nozzle color and size | Orange 2.8mm | Red 3.0mm | Red/Orange |
| Operating pressure available | 320 kPa | 320kPa | 320 kPa |
| Sprinkler application rate in mm per hour | 2.9 mm/hr | 3 mm/hr | 3 mm/hr |
| Length of watering time per set | 12 hours | 12 hours | 12 hours |
| Total amount of irrigation water applied during each set period | 34 mm | 35mm | 35mm |
| System capability in millimetres per week applied | | | 60 |
| Number of sprinkler pods per K-Line | 7 | 3 | 10 |
| Output per sprinkler | 533 l/hour | 628 l/hour | |
| Total cubic metres per hour (1000's litres) needed for this area | 4.4 $m^3$/hr. | 1.6 $m^3$/hr | 6.0 $m^3$/hr |

## Notes

This layout can be best irrigated with 2 separate K-Line sprinkler pod lines. One line has 7 pods and the other has 3 pods. Because the shift width and pod spacing is different for each K-Line, using a red nozzle in one and an orange nozzle in the other will equalize the water application rate.

# Sample Design 6: K-Line Irrigation for your Rugby Field




This design can be used for football or soccer fields and consists of a 5 pod system with 8 sets or shifts.

The pods are spaced at 13m intervals, but spacing can be increased up to appproximately 15m to accommodate your field. The Set or Shift widths are 16m wide but should not be increased any further, but could be moved closer to allow another full set to be added.
When water is applied at 320 kPa with a impact sprinkler with a black 4.0mm nozzle, the application rate is approximately 4.8mm per hour. In this design, your total water requirement is 4.98m³/hr per hour.

Another shifting alternative is that the operator can either move the line every hour through the course of an 8 hour day, or every 2 hours over the course of 2 days.

Application amounts can be altered using different nozzle sizes and/or by adjusting watering time.