



Drip Watering

Made Easy

Everything you need to know about
planning, installing & maintaining
your low volume watering system

FREE

7th Edition
March 2008



What Healthier, faster growing landscape plantings a way to Carefree, beautiful small area gardens & patio plants Water! High yield, weed resistant vegetable gardens

Less work • Less water • Better results

The RAINDRIP® Advantage

Raindrip® systems are engineered so that what is installed today will not be obsolete tomorrow. Raindrip® parts are designed with expansion in mind. You can start with a simple kit and, as your watering needs change, the Raindrip® system can easily be expanded to accommodate these requirements. Raindrip® is so confident in our quality engineering approach that the complete product line is covered by a Raindrip® limited warranty. This confidence is based on built-in features that make Raindrip's products last; features other micro watering systems can't match.

Constant Water Flow Rate

Raindrip's *pressure compensating* products are designed to maintain a constant flow rate for a wide range of inlet water pressures making planning and installation easy with fewer parts to assemble. This feature also allows more watering devices to be placed on a single line, increasing versatility and decreasing complexity.

Clog Free PC Dripper

Raindrip's *turbulent-flow* design for its PC model drippers causes the water to flow through a maze forcing continuous changes in direction. This turbulence keeps dirt particles, which might clog the dripper, in continuous motion until they leave the dripper outlet.



Easy Installation

A Raindrip® system is simple and fun to install. No wrenches, saws or glue are required. It's almost impossible to make a mistake which cannot be easily corrected. Once installed, your hand watering days are over. Watering labor is reduced to a few minutes a week.

RAINDRIP® has micro watering experts to help you with any questions.

Just call 888-825-4716 or e-mail raindrip@raindrip.com

Visit our website at www.raindrip.com

How to use this guide:

Use the color-coded tabs to zero in on the information you need to plan and install your own custom micro watering system.

GENERAL PLANNING

GENERAL INFORMATION

Benefits • Advantages

4-5

BASIC COMPONENTS OF A RAINDRIP® SYSTEM

Definition of Terms

6-7

WATERING & CONVERSION DEVICES PARTS LIST

How & Where to Use Which Watering Device

8-11

PLANNING YOUR LAYOUT

How to Group Plants / Landscape Layout / Quick Start Chart

12-14

WATERING SPECIFIC PLANT TYPES

The color-coded tabs indicate sections of the booklet dedicated to planning for the watering of particular plant types and groupings.

Each Section includes:

- Watering Device Choices
- Rules of Thumb
- Planning Information
- Suggested Layouts and Applications

TREES & SHRUBS

15-17

FLOWER BEDS & GROUND COVER

18-19

VEGETABLE GARDENS

20-21

CONTAINER PLANTS

22-23

CONVERSION

How to convert underground sprinklers to drip watering

24-25

INSTALLING & USING A RAINDRIP® SYSTEM

INSTALLATION FOR ALL PARTS

Putting it all together

26-42

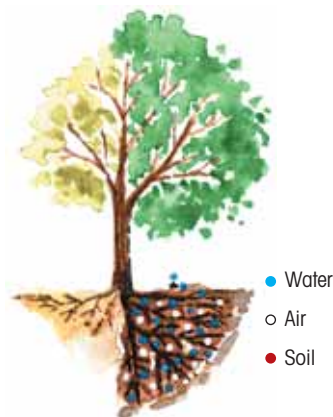
USING YOUR SYSTEM

Guidelines, troubleshooting tips and helpful hints

43-47

Q. What is Drip Watering?

A.



Slow, even watering directly to the root zone...

The slow, precise delivery of water directly to the root zone of your plants keeps the root zone moist, but never saturated. The plants retain their proper air and water balance and avoid the stress and shock of the “drench and dryout” cycle associated with conventional watering methods. This results in optimum growth and healthier plants.

Advantages & Benefits

SAVE WATER

Micro watering reduces water usage and evaporation by up to 70%.

REDUCE PLANT STRESS

Plants will be healthier overall resulting in earlier production, up to 49% faster growth and up to 84% higher yields.

REDUCE WEED GROWTH

A drip system waters only the root zone of the plants you want to water, not the weeds.

PREVENT RUN-OFF & EROSION

Water is applied at the rate the soil can accept it.

XERISCAPE COMPATIBILITY

RAINDRIP® ‘Water-Wise’ systems are a must for landscaping in all drought sensitive areas.

SAVE MONEY

- Easy, do-it-yourself installation
- Reduced water bill

SAVE TIME

- No more hand watering
- Less gardening maintenance

SAVE ENERGY

Lower operating pressure results in reduced energy requirements. A real plus for pump driven systems.

VERSATILE & DURABLE

- Use for hillsides or flat terrain
- Hose can be buried or left above ground year-round

AUTOMATIC TIMER OPTIONS

- All RAINDRIP® systems can be used with our Automatic Electronic Timer.

Answers to Frequently Asked Questions

Can I mix different types of watering devices on the same line?

It's OK to mix different kinds of drippers together and it's OK to mix sprinklers and micro spray jets together. But don't mix drippers or Drip-A-Long® on the same circuit with higher flow rate devices such as sprinklers, jets and adjustable bubblers. For best results, give them their own separate systems.

How much pressure do I need?

25 PSI is enough to satisfy the requirements of all Raindrip® watering devices.

How far can I run the hose / tube?

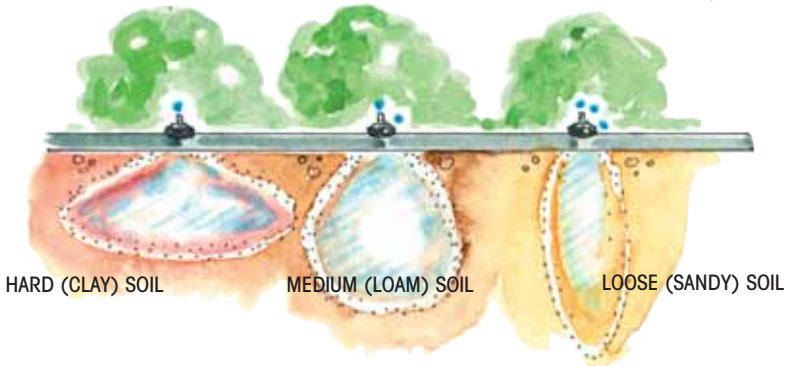
- Limit the total amount of plain 1/2" hose in a single circuit to 200 feet.
- Limit the total amount of 1/4" tubing in a single circuit to 50 feet.

How many watering devices can I put on one circuit?

- Limit the total volume of watering devices on a single 1/2" hose circuit to 150 GPH.

What if my soil is very hard or very sandy?

- For Clay (Hard) Soil use 1/2 GPH drippers
- For Loam (Normal) Soil use 1 GPH Drippers, Sprinklers or Micro Spray Jets.
(Adjustable Bubblers can also be used if you have basins around the plants).
- For Sandy (Loose) Soil use 2 GPH Drippers, Bubblers, Sprinklers or Spray Jets.

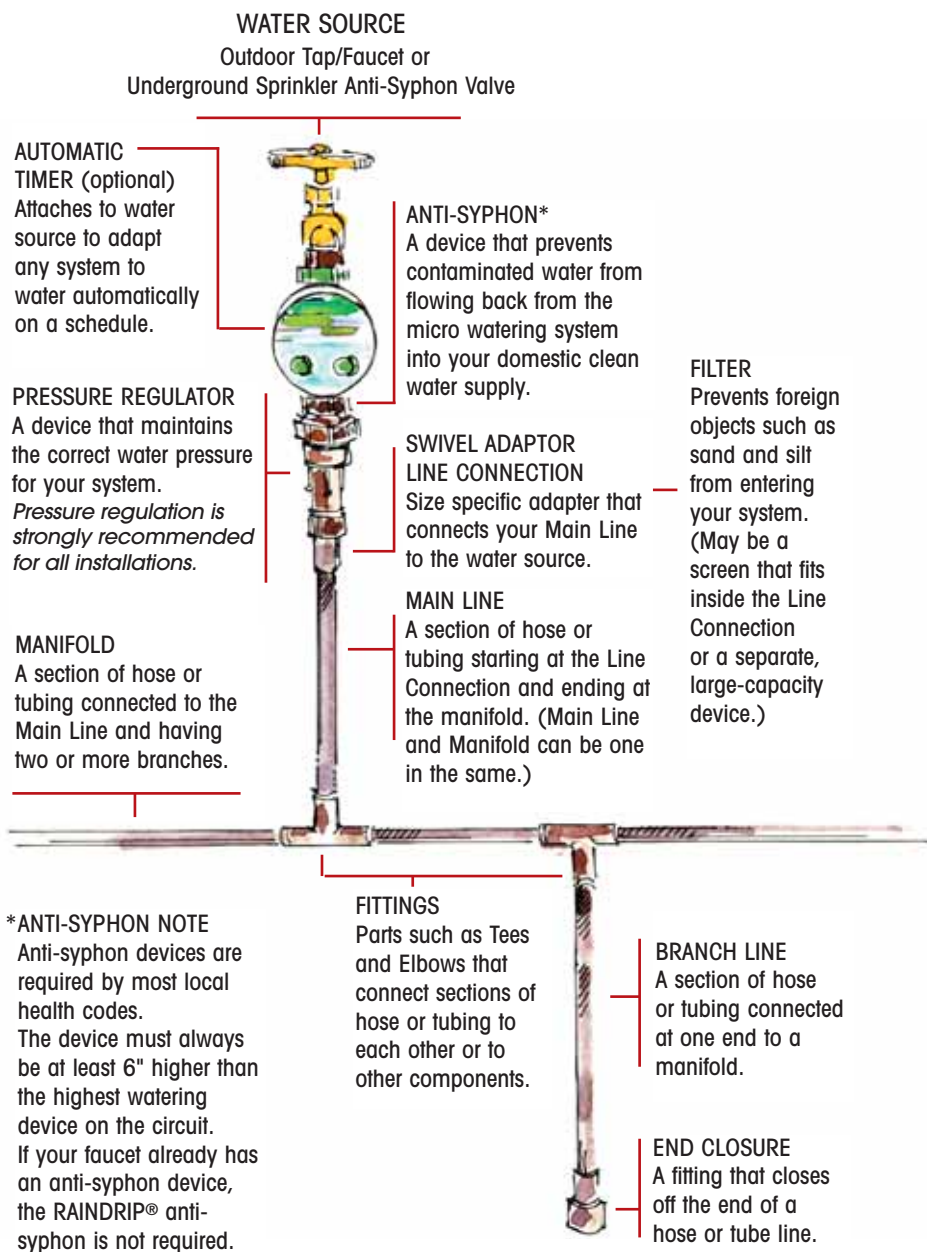


Glossary of Terms

CIRCUIT or SYSTEM -	A group of components consisting of a Filter, Anti-Syphon, Regulator, Swivel Adaptor, Main Line, Branch Lines and Watering Devices, connected to a water source by a single valve, working together to supply water to one of your plant groups.
Foot / Feet (ft. or ') -	Equals .3 meters
Gallon (gal.) -	Equals 3.8 liters
GPH -	Gallons per Hour (One GPH = 3.8 liters per hour)
Inch / Inches (") -	Equals 25 millimeters
PC -	Pressure Compensating
PSI -	Pounds per Square Inch (One PSI = 0.069 bar)
ZONE -	A plant group watered by a single circuit.

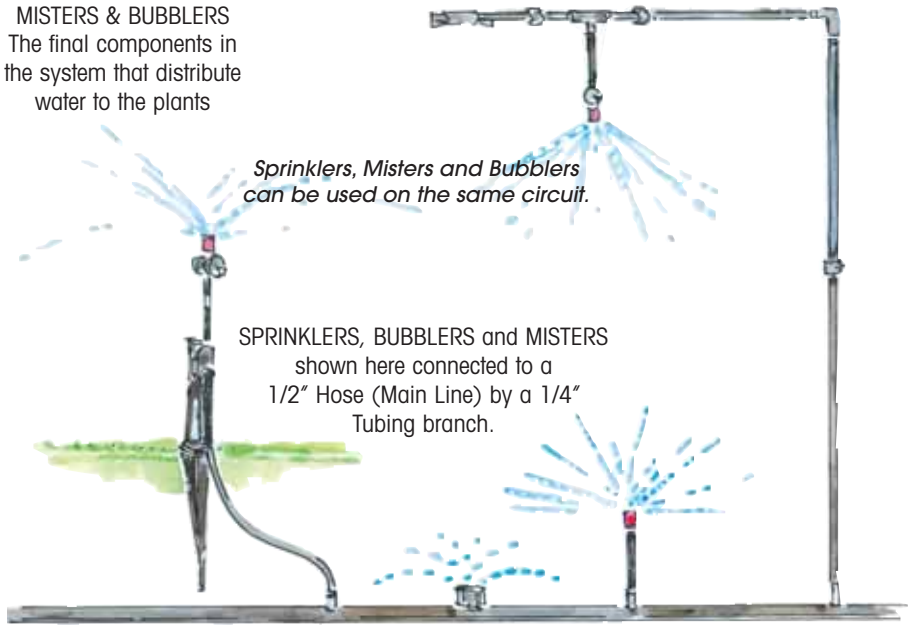
BASIC COMPONENTS of a RAINDRIP® SYSTEM

Water Source Connection



Watering Devices

DRIPPERS, SPRINKLERS, MISTERS & BUBBLERS
The final components in the system that distribute water to the plants



Sprinklers, Misters and Bubblers can be used on the same circuit.

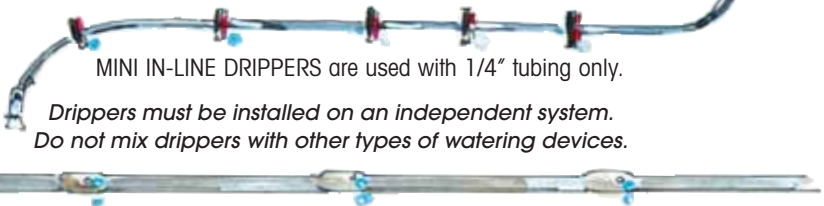
SPRINKLERS, BUBBLERS and MISTERS shown here connected to a 1/2" Hose (Main Line) by a 1/4" Tubing branch.

SPRINKLER on a Stake connected to Main Line by a 1/4" Tubing branch

BUBBLERS on-line and in a Stake connected by a 1/4" branch to the Main Line



ON-LINE DRIPPERS can be mounted directly onto the 1/2" Hose or connected to a Branch line using a 1/4" Tubing 'pig-tail' (1/4" branch). PC DRIPPERS work well in elevated applications such as hillsides and hanging plants.



MINI IN-LINE DRIPPERS are used with 1/4" tubing only.

Drippers must be installed on an independent system. Do not mix drippers with other types of watering devices.

1/4" or 1/2" Drip-A-Long® has evenly spaced built-in drippers and can bring your system to drip water vegetable gardens and plants in rows.

Watering Devices/DRIP PRODUCTS

The most precise watering device for all plants. RAINDRIP® drippers are available individually for inserting in the hose as you choose - ideal for irregularly spaced plants - or pre-inserted in hose or tubing (Drip-A-Long®) for use with regularly spaced plants.

INDIVIDUAL DRIPPERS

Drippers are the best for individual, upright plants both large and small. Individual drippers are also a good choice for small containers.



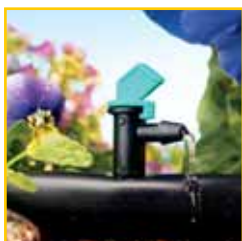
“PC” PRESSURE COMPENSATING DRIPPERS

On-line PC drippers are available in 1/2, 1 & 2 GPH flow rates and maintain their flow rate for inlet pressures ranging from 10 - 60 PSI. PC Drippers may be inserted directly into Raindrip® Hose (using Hole Punch #R630CT, or Professional Hole Punch #63100UB) or used at the end of 1/4" tubing.



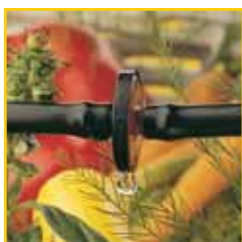
BUTTON DRIPPERS

Value-priced, turbulent-flow on-line drippers. Appropriate for most drip watering applications on flat terrain. Available in 1/2, 1 and 2 GPH flow rates. Button Drippers may be inserted directly into Raindrip® Hose (using Hole Punch #R630CT, or Professional Hole Punch #63100UB) or used at the end of 1/4" tubing.



FLAG DRIPPERS

On-line, laminar flow drippers with *take-apart* design for easy cleaning. Available in 1, 2 and 4 GPH flow rates. 4 GPH flow rate works best for loose or sandy soil. Flag Drippers may be inserted directly into Raindrip Hose (using Hole Punch #R630CT, or Professional Hole Punch #63100UB) or used at the end of 1/4" tubing.



MINI-IN-LINE DRIPPERS

Mini-In-Line drippers are best for irregularly spaced plants in short rows. They work very well in planter boxes. Raindrip® Mini-In-Line drippers are available in 1/2 and 1 GPH flow rates. *Use only with Raindrip® 1/4" tubing.*

DRIP-A-LONG®

The reliability of a drip system with the convenience of a soaker hose.



1/2" DRIP-A-LONG®

RAINDRIP®'s 1/2" polyethylene hose with 1 GPH PC drippers installed within the tubing is used for long rows of evenly spaced, individual plants. The continuous wetting along the entire length of the hose is ideal for hedges, tree rows and vegetable gardens. Available with drippers spaced 12" or 18" apart.



1/4" DRIP-A-LONG®

1/4" flexible polyethylene tubing with 1/2 GPH self-cleaning drippers built in every 12". Ideal for watering small plants in rows, such as vegetable gardens and borders. Individual lines can be up to 20' long or may be added onto an existing drip system.

Watering Devices/ADJUSTABLE BUBBLERS

RAINDRIP® Adjustable Bubblers are useful when watering small and large plants on the same circuit and are often used in conjunction with RAINDRIP® Conversion Devices when adapting underground sprinkler systems to micro watering. Bubblers can replace several drippers in large, round containers. Use when higher flow rates (up to 24 GPH) are desired.



FULL CIRCLE FAN SPRAY BUBBLERS

Adjustable Bubbler mounted on a sturdy stake with a barbed connector to attach to the Main Line with a 1/4" tubing line. Adjustable from 0-24 GPH @ 30 PSI - 13 ft. diameter.



STREAM SPRAY BUBBLERS

Full and half circle Bubblers are available individually, on stakes and with 1/2" FPT thread. Adjustable from 0-13 GPH @ 30 PSI - 3 ft. diameter.

Watering Devices/SPRINKLERS•JETS

Use Sprinklers & Micro Spray Jets for broad areas of closely-spaced, low-growing plants such as ground cover or flower beds. They are also good for germinating seeds planted in the ground. Available in a variety of spray patterns and mounted on a selection of stakes, risers and pop-up assemblies.



ADJUSTABLE LOW FLOW SPRINKLERS

Adjustable flow rate from 4 to 20 GPH @ 25 psi. Full, half and quarter circle patterns from 7' to 9' radius. Also available in 4' x 16' "bow-tie" (strip) pattern.

ECONOMY LOW-FLOW SPRINKLERS

Non-adjustable flow rate from 8 to 26 GPH @ 25 PSI. Full, half and quarter circle patterns from 6' to 10' radius. Also available in "bow-tie" (strip) pattern.



MICRO SPRAY JETS

Non-adjustable 12 GPH flow rate @ 25 PSI. Full, half and quarter circle patterns from 7' to 8' radius. Available with Aqua-Pop assembly for below-ground, pop-up operation.



SUPER JETS

Pressure-compensating unit ideal for hillsides. Available in flow rates from 5 to 18 GPH, 6' to 9.8' radius. Full circle only.

Watering Devices/MISTERS

Misters produce a cone-shaped, mist-like spray. Use them to water hanging plants and to keep the leaves of plants such as ferns and bromeliads moist. Also good for lowering plant leaf temperatures in greenhouses.



JET MISTER & 4" RISER

Available in adjustable and non-adjustable versions. 3' diameter spray, 4-7 GPH.



TORNADO MISTER

Non-adjustable. 5' diameter spray, 7 GPH

CONVERSION DEVICES

Conversion Devices are used to convert existing, conventional underground sprinkler systems to micro watering. A wide variety of devices are offered.



HYDROPORT™ 4 PORT & 8 PORT MANIFOLDS

This manifold has 4 or 8 fully adjustable ports to provide flow rates from 0-30 GPH. Swivel arms make tubing placement easy. Filter prevents clogging. Pressure rated up to 80 PSI.



DRIP STAR™

The dispenser has 6 outlets, each with a flow rate of 1 GPH. The DRIP STAR™ easily installs on 1/2" female pipe threads to convert your underground sprinklers to drip. Convenience of watering multiple plants from one device with the benefits of drip irrigation.



MULTIPLEX DRIPPER™ ASSEMBLY / MULTIPLEX BUBBLER ASSEMBLY

Each unit contains 6 independent, pressure compensating outlets. Available in 2, 6, 10, 20 GPH flow rates.



6-OUTLET MANIFOLD

Each of the 6 PC outlets are fully adjustable from 0-20 GPH, maintaining a constant flow rate.



4-OUTLET BUBBLER

Contains 4 PC Bubbler. Available in 2,6,10,20 GPH



SWIVEL TEE ASSEMBLY

Connects two lengths of 1/2" RAINDRIP® hose to a 1/2" pipe riser.



SWIVEL ELBOW ASSEMBLY

Connects 1/2" RAINDRIP® hose to a 1/2" pipe riser.



1/2" RISER ADAPTER

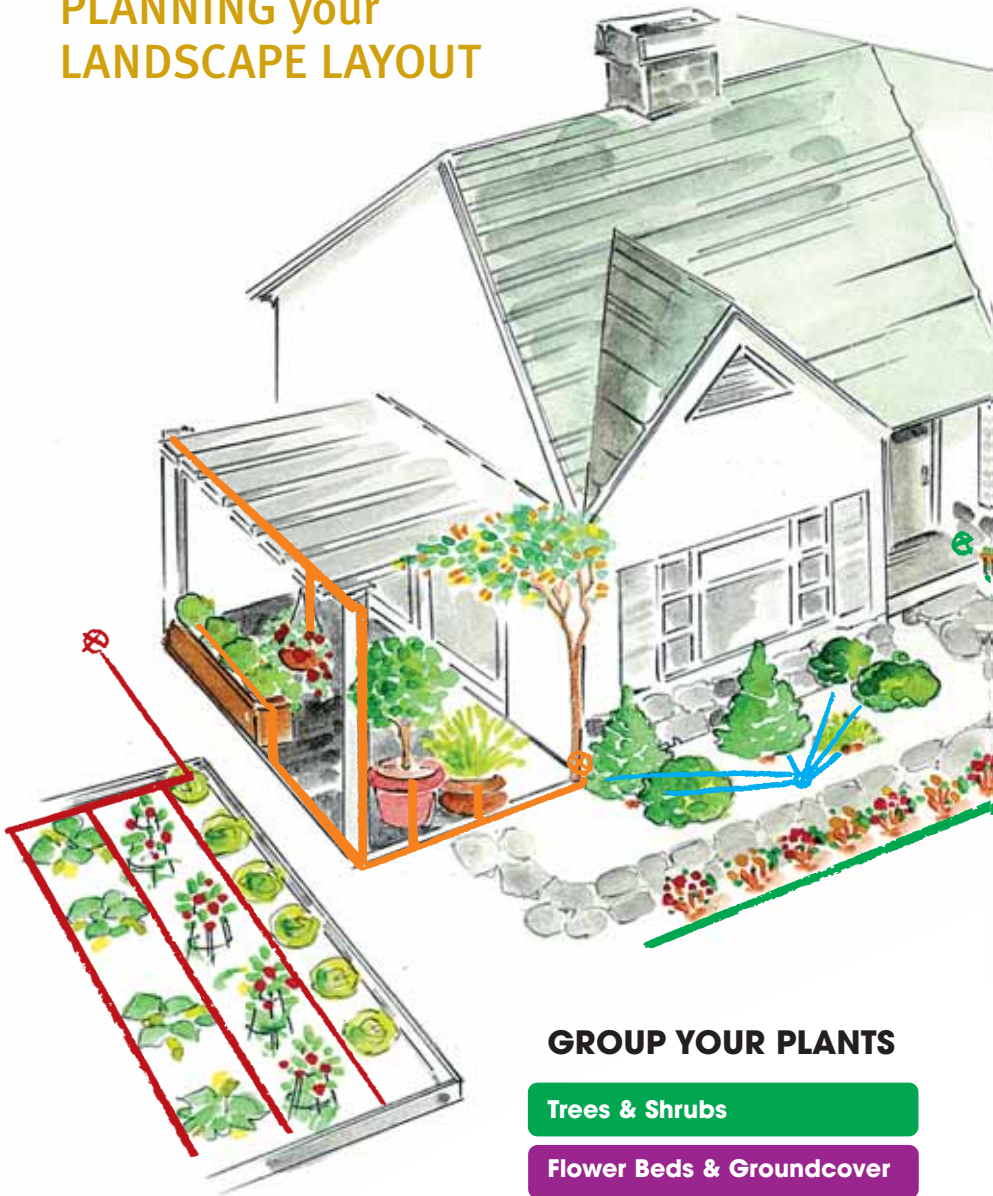
Connects RAINDRIP® sprinklers and jets to a 1/2" pipe riser.



1/4" DRIP LINE TAP-OFF

Connects 1/4" tubing to existing 1/2" pipe riser.

PLANNING your LANDSCAPE LAYOUT



GROUP YOUR PLANTS

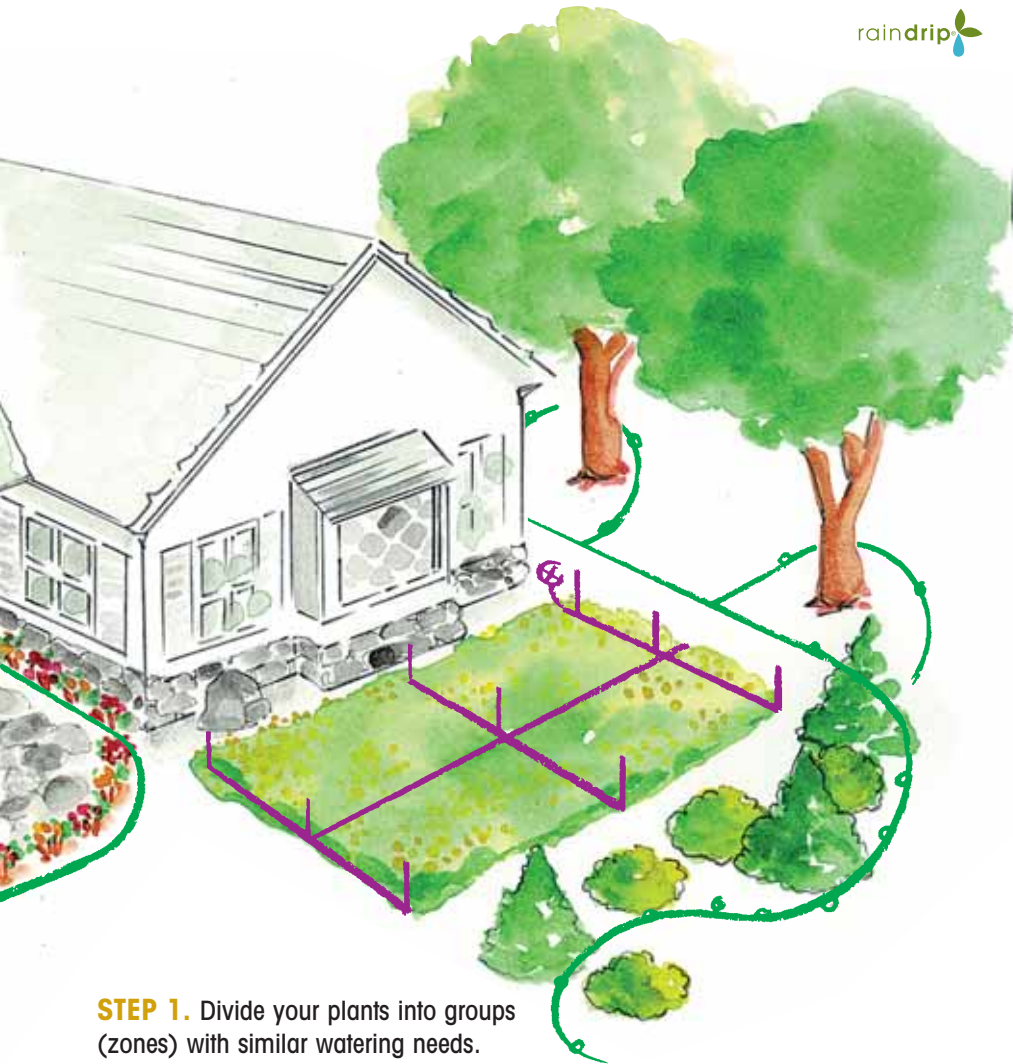
Trees & Shrubs

Flower Beds & Groundcover

Vegetable Gardens

Container Plants

Conversion Applications



STEP 1. Divide your plants into groups (zones) with similar watering needs.

For example:

- Seasonal plantings like vegetable gardens should be watered separately from permanent plantings like landscape shrubs.
- Plants that require frequent, shallow watering such as annual flowers should be grouped separately from plants that prefer infrequent, deep watering like trees.
- Plants in full sun should be watered separately from plants in the shade.
- Container plants with confined root systems should be grouped separately from plants in the ground.

STEP 2. Decide on the most common growth characteristic of each group:

- A. Individual vs. Closely-Spaced
- B. Upright vs. Low-Growing
- C. Even Spacing vs Irregular Spacing

If possible, use a separate micro watering circuit for each different group.

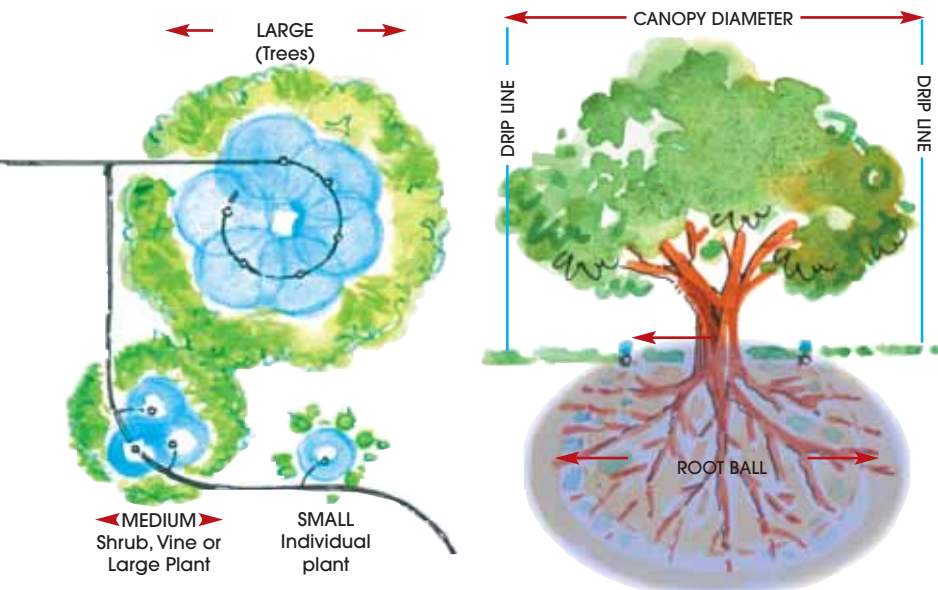
QUICK-start GUIDE

1. Choose a Type of Water Device for Each Plant Group

*** IDEAL ** GOOD * ACCEPTABLE X DO NOT USE	DRIPPERS	DRIP-A-LONG®	BUBBLERS	SPRINKLERS, SPRAYERS & JETS	MISTERS
NORMAL to HEAVY SOIL		USE 18" SPACING			
INDIVIDUAL	***	X	*	X	X
GROUPS	**	**	**	*	X
ROWS	***	***	X	X	X
LOOSE / SANDY SOIL		USE 12" SPACING			
INDIVIDUAL	*	*	**	**	X
GROUPS	**	**	**	*	X
ROWS	***	***	*	X	X
GROUNDCOVER	X	**	X	***	X
CONTAINERS	***	X	**	X	**
COOLING+HUMIDITY	X	X	X	*	***

2. Choose the Number of Watering Devices for Each Plant

The number of watering devices depends on the flow rate of the device and size of the plant's rootball which is usually related to its canopy diameter. The canopy diameter is the distance from one edge of the drip line across to the opposite edge. Rule of Thumb: Use a sufficient number of watering devices to wet at least 60% of the rootball of each plant.



3. Go Directly to the Installation Section Starting on Page 26

PLANNING for TREES & SHRUBS

WATERING DEVICES for TREES and SHRUBS						
*** IDEAL ** GOOD * ACCEPTABLE ■ MARGINAL X DO NOT USE	DRIPPERS		DRIP-A-LONG®		BUBBLERS	ADJUSTABLE SPRINKLERS
	PC BUTTON FLAG	IN-LINE	1/2"	1/4"		
NORMAL / HEAVY SOIL			USE 18" SPACING			
INDIVIDUAL	***	*	***	*	*	■
GROUPS	**	■	**	■	**	*
ROWS	**	*	**	**	■	X
LIGHT / SANDY			USE 12" SPACING			
INDIVIDUAL	*	■	**	*	**	**
GROUPS	**	■	**	■	**	**
ROWS	**	■	**	**	*	■

RULES of THUMB

- Place watering devices in such a manner as to wet at least 60% of the rootball of each plant.
- Do not use more than 200 feet of plain 1/2" hose in a single circuit.
- Limit the total gallonage of watering devices on a single circuit to 150 GPH.

For example:

300 1/2- GPH drippers (300 x 1/2 = 150)

150 1-GPH drippers (150 x 1 = 150)

7 Adjustable Stream Bubblers (7 x 20 = 140)

150 feet of 1/2" Drip-A-Long® (12" spacing)

225 feet of 1/2" Drip-A-Long® (18" spacing)

New to Micro Irrigation? Get started with a kit!



The **RAINDRIP® Landscape Kits** R520DP and R530DP are designed to make any do-it-yourself gardener an "instant expert". These kits include everything you need to easily install a drip system for trees and shrubs. Step-by-step instructions and suggested layouts to ensure a successful installation are included in the kit.

SAMPLE LAYOUTS for TREES and SHRUBS

DRIPPERS & DRIP-A-LONG®

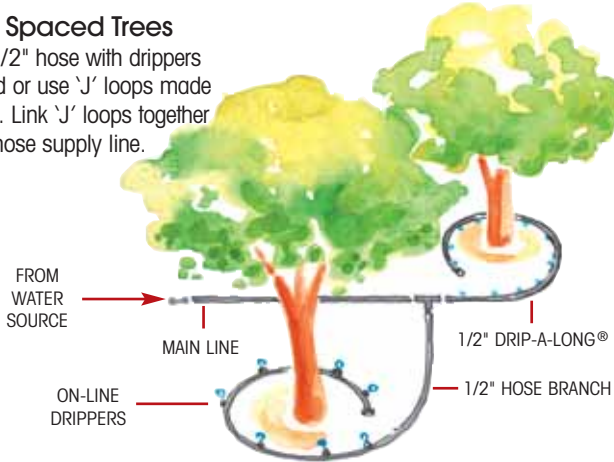
Trees in Rows

Connect drippers directly to 1/2" Hose or use 1/2" Drip-A-Long®.



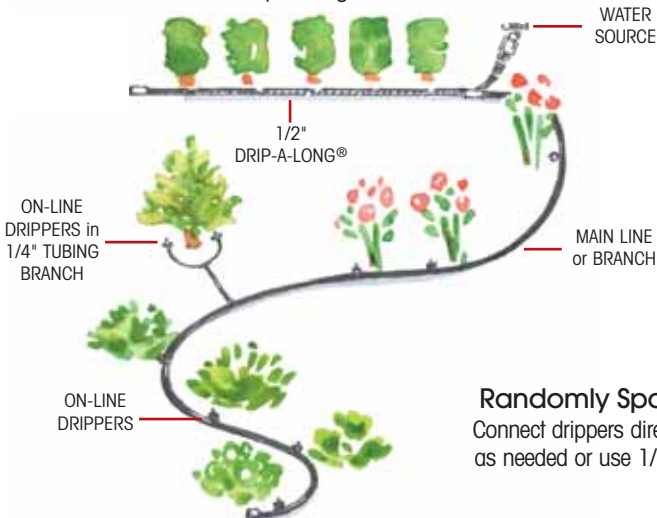
Randomly Spaced Trees

Use 'J' loops of 1/2" hose with drippers inserted as required or use 'J' loops made from Drip-A-Long®. Link 'J' loops together with 1/2" hose supply line.



Shrubs in a Row

Connect drippers directly to 1/2" hose as needed or use 1/2" Drip-A-Long®.

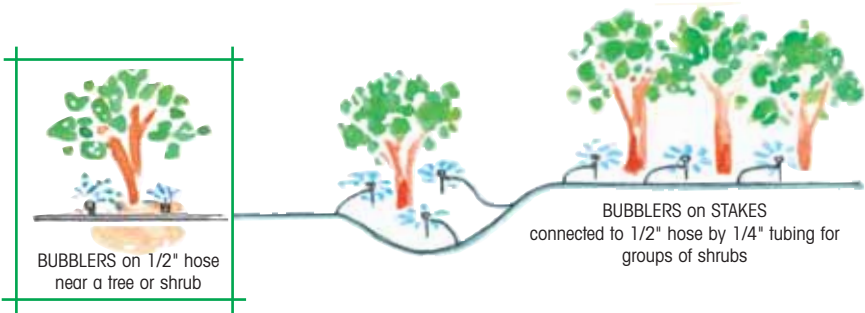


Randomly Spaced Shrubs

Connect drippers directly to 1/2" hose as needed or use 1/2" Drip-A-Long®.

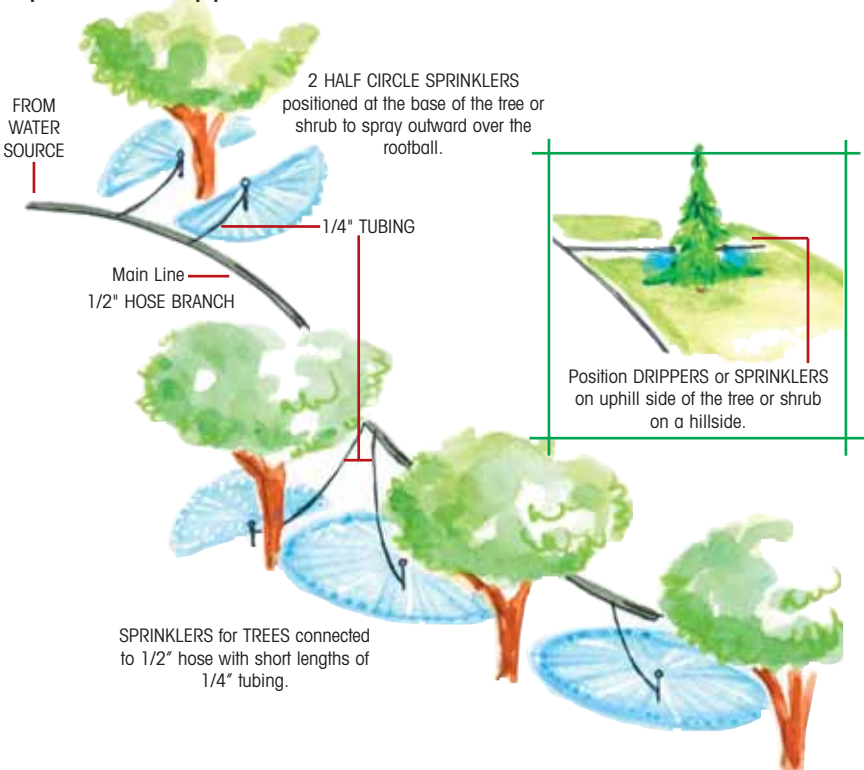
BUBBLERS

Connect several Bubblers to a 1/2" supply hose



SPRINKLERS or JETS

Sprinkler/Jet Application for one Tree or for a Row of Trees/Shrubs



PLANNING for FLOWER BEDS & GROUNDCOVER

WATERING DEVICES for FLOWER BEDS & GROUNDCOVER

✱✱✱✱ IDEAL ✱✱ GOOD ✱ ACCEPTABLE ■ MARGINAL ✘ DO NOT USE	DRIPPERS		DRIP-A-LONG®		SPRINKLERS, SPRAYERS & JETS
			1/2"	1/4"	
NORMAL / HEAVY SOIL			USE 18" SPACING		
INDIVIDUAL	✱✱		■	■	
GROUPS	■		✱	✱	✱✱✱
ROWS	✱✱		✱✱	✱✱✱	■
LIGHT / SANDY			USE 12" SPACING		
INDIVIDUAL	✱✱		■	✱	■
GROUPS	■		✱	■	✱✱✱
ROWS	✱✱		✱✱	✱✱✱	■

RULES of THUMB for DRIPPERS & DRIP-A-LONG®

- Place watering devices in such a manner as to wet at least 60% of the rootball of each plant.
- Do not use more than 200 feet of plain 1/2" hose in a single circuit.
- Limit the total gallonage of watering devices on a single circuit to 150 GPH.
For example:
300 1/2- GPH drippers
(300 x 1/2 = 150)

150 1-GPH drippers
(150 x 1 = 150)

150 feet of 1/2" Drip-A-Long®
(12" spacing)

225 feet of 1/2" Drip-A-Long®
(18" spacing)

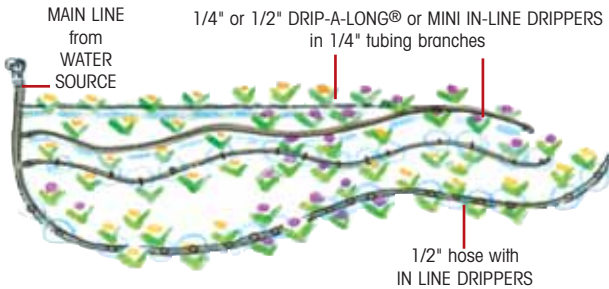
RULES of THUMB for SPRINKLERS & JETS

- Place watering devices in such a manner as to wet the ENTIRE rootball of each plant.
- Plan on at least one low volume sprinkler for every 50 square feet of plant material. Ideally all sprinklers should overlap their neighbor by 50% (half the radius) or more.
- Sprinklers and jets require a MINIMUM pressure of 25 PSI.
- Do not use more than 150 feet of plain 1/2" hose in a single circuit.
- Do not use more than 5 feet of 1/4" tubing between the 1/2" hose and a full circle device or more than 10 feet for half circle, quarter circle or bow tie devices.
- Limit the total number of devices on a single circuit to 200 GPH. For example: 4 quarter circle sprinklers, 5 half circle sprinklers and 4 full circle sprinklers.

It is easy to position sprinklers to water any area of groundcover.
RAINDRIP® Sprinklers, Sprayers and Jets are not for turf.

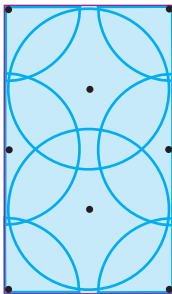
SAMPLE LAYOUTS for BEDS & GROWDCOVER

DRIPPERS & DRIP-A-LONG®

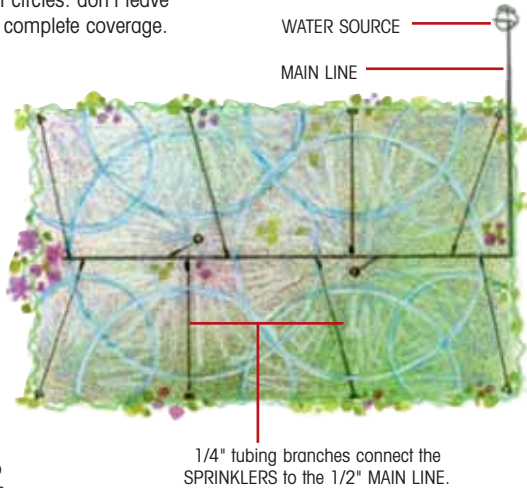


SPRINKLERS & JETS

Determine where the full circle sprinklers will be positioned then, fill in with the quarter and half circles. don't leave gaps. Plan for spray overlap to get complete coverage.



Quarter circle, half circle, full circle and 'bow-tie' SPRINKLERS can be positioned to custom water any groundcover configuration.



New to Micro Irrigation? Get started with a kit!



The **RAINDRIP® Micro Watering Kits** A541DP or R547DP are designed to make any do-it-yourself gardener an "instant expert". These kits include everything you need to easily install a micro watering system for flower beds and groundcover. Step-by-step instructions and suggested layouts to insure a successful installation are included in the kit.

PLANNING for VEGETABLE GARDENS

WATERING DEVICES for VEGETABLE GARDENS				
*** IDEAL ** GOOD * ACCEPTABLE ■ MARGINAL X DO NOT USE	DRIPPERS		DRIP-A-LONG®	
	PC BUTTON FLAG	IN-LINE	1/2"	1/4"
INDIVIDUAL	***	*	*	*
ROWS up to 15' LONG	**	**	**	***
ROWS 15' - 50' LONG	*	X	***	X
ROWS over 50' LONG	*	X	***	X

RULES of THUMB

- Place watering devices in such a manner as to wet at least 60% of the rootball of each plant.
- Do not use more than 200 feet of plain 1/2" hose in a single circuit.
- Limit the total gallonage of watering devices on a single 1/2" hose circuit to 150 GPH.

For example:

300 1/2-GPH Drippers (300 x 1/2 = 150)
 150 1-GPH Drippers (150 x 1 = 150)
 150 feet of 1/2" Drip-A-Long® (12" spacing)
 225 feet of 1/2" Drip-A-Long® (18" spacing)

- Do not use more than 50 feet of plain 1/4" tubing in a single circuit.
- Limit the total gallonage of drippers on a single 1/4" tube circuit to 15 GPH.

For example:

10-1 GPH Mini Inline Drippers (10 x 1 = 10)
 20 feet of 1/4" Drip-A-Long® (20 x 1/2 = 10)

Growing vegetables is easy with a kit!



The **RAINDRIP® Drip Watering Vegetable Kit R562/567DT** and the **1/2" Drip-A-Long® System R290DP** are two kits we recommend. Both have everything you need to drip water a vegetable garden, including illustrated, easy-to-follow instructions and suggested layouts to ensure a successful installation and a carefree garden.

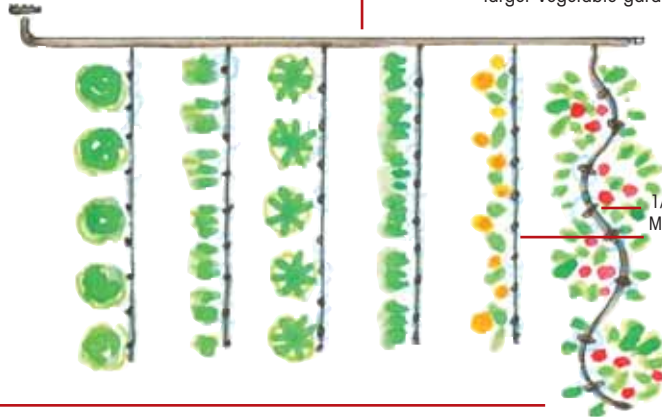
SAMPLE LAYOUTS for VEGETABLE GARDENS

1/4" DRIP-A-LONG® and MINI IN-LINE DRIPPERS

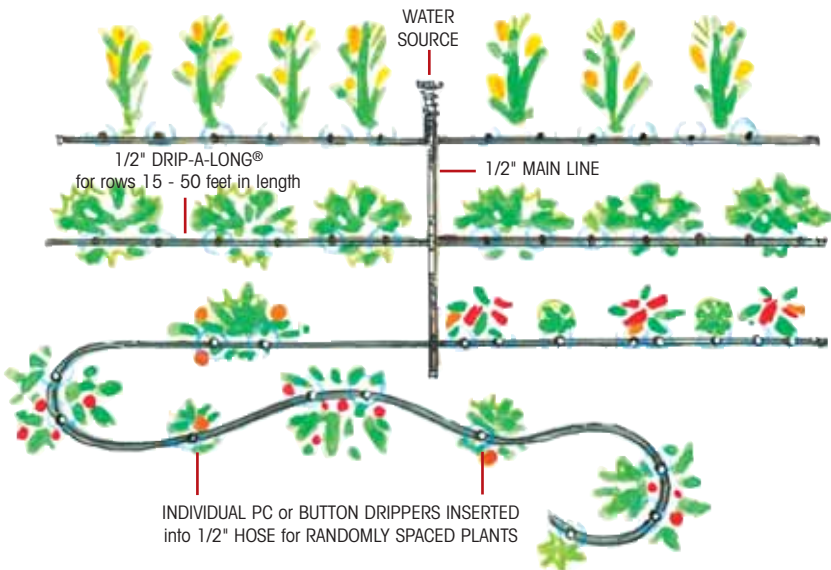
WATER SOURCE

MAIN LINE

Main line may be 1/4" tubing for small gardens up to 120 sq. ft. 1/2" hose is recommended for larger vegetable gardens.



1/2" DRIP-A-LONG® and PC or BUTTON DRIPPERS



PLANNING for CONTAINERS

WATERING DEVICES for CONTAINERS

✱✱✱ IDEAL ✱✱ GOOD ✱ ACCEPTABLE ■ MARGINAL ✕ DO NOT USE	DRIPPERS		BUBBLERS	1/4" DRIP-A-LONG®	MISTERS
	PC BUTTON FLAG	IN-LINE			
SMALL CONTAINERS	✱✱✱	✱	✕	■	■
LARGE CONTAINERS	✱✱	✱✱	✱✱✱	✱✱	✕
PLANTER BOXES	✱	✱✱✱	✱	✱✱✱	✕
HANGING PLANTS	✱✱✱	✕	✕	✕	✱
GREEN HOUSE PLANTS					
Individual Plants	✱✱	✱✱	✕	✕	■
Massed Plants	✕	✕	■	✕	✱✱
Raising Humidity	✕	✕	✕	✕	✱✱✱

RULES of THUMB

- Place all watering devices in such a manner as to wet at least 60% of the rootball of each plant.
- Do not use more than 200 feet of 1/2" hose in a single circuit.
- Limit the total gallonage of watering devices on a single 1/2" hose circuit to 150 GPH.

For example:

300 1/2- GPH drippers (300 x 1/2 = 150)

150 1-GPH drippers (150 x 1 = 150)

7 Adjustable Stream Bubblers (7 x 20 = 140)

150 feet of 1/2" Drip-A-Long® (12" spacing)

225 feet of 1/2" Drip-A-Long® (18" spacing)

- Do not use more than 50 feet of plain 1/4" vinyl tubing in a single circuit.
- Limit the total gallonage of drippers on a single 1/4" tube circuit to 15 GPH.

For example:

15 1 - GPH Mini Inline drippers (15 x 1 = 15)

20 feet of 1/4" Drip-A-Long® (30 x 1/2 = 15)

NEW TO MICRO IRRIGATION? START OUT WITH A KIT

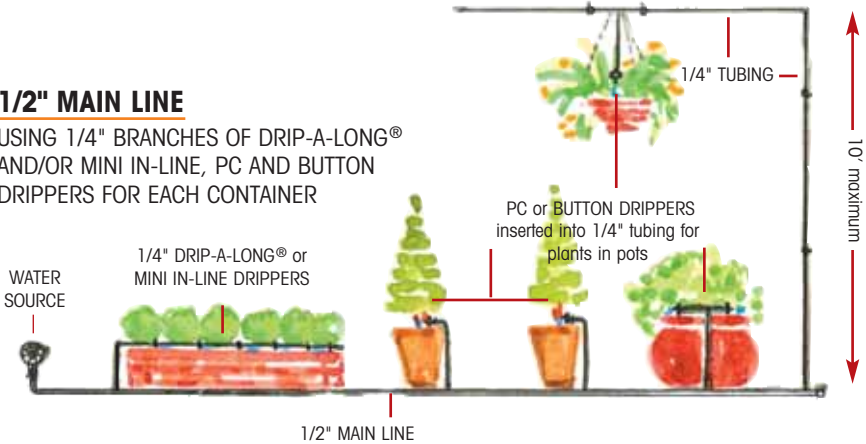
RAINDRIP® has several **Drip Watering Kits** for micro watering container plants. **R551DT**, **R552/557DT**, **R553DP**, **R556DP** and **R559DP** all include everything you need to water hanging plants, large and smaller pots, plus planter boxes as well. This is an easy, carefree system for watering all patio plants!



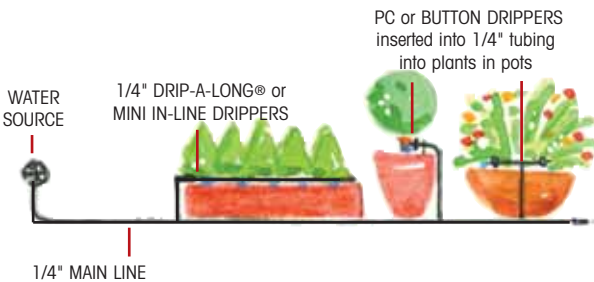
SAMPLE LAYOUTS for CONTAINERS

1/2" MAIN LINE

USING 1/4" BRANCHES OF DRIP-A-LONG® AND/OR MINI IN-LINE, PC AND BUTTON DRIppers FOR EACH CONTAINER

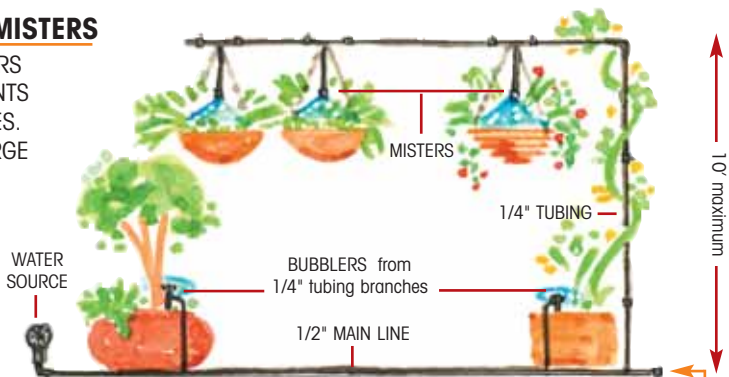


1/4" MAIN LINE














BUBBLERS & MISTERS

OVERHEAD MISTERS for HANGING PLANTS and GREENHOUSES. BUBBLERS for LARGE PLANTS in POTS on the GROUND.



***SAFETY NOTE:** To avoid possible contamination of your water supply resulting from irrigation water backing up into your system, the ground-level end of your supply line, farthest from the faucet, must be located at the lowest point in the circuit.

PLANNING for CONVERSION DEVICES

CONVERSION DEVICES SELECTION GUIDE						
 IDEAL  GOOD  ACCEPTABLE  MARGINAL  DO NOT USE	 DRIP STAR™ (6 outlets), MULTI-PLEX DRIPPER™ (8 outlets)	 HYDROPORT™ (8 outlets), M'PLEX BUBBLER™ (6 outlets), 4-OUTLET BUBBLER (8 outlets)	 ADJUSTABLE 6-OUTLET MANIFOLD	 SWIVEL TEE/ELBOW (Up to 600 outlets)	 1/2" RISER ADAPTER (One outlet)	 1/4" TAP OFF (One outlet)
TO CONVERT SPRINKLERS TO:						
INDIVIDUAL DRIP OUTLETS FOR:						
TREES	***	***	**	**	X	X
INDIVIDUAL PLANTS	X	X	X	X	X	***
GROUPS OF PLANTS	***	**	**	*	X	X
ROWS OF PLANTS	■	■	■	***	X	X
CONTAINERS	**	■	■	*	X	**
1/2" DRIP-A-LONG®	X	X	X	***	X	X
ADJUSTABLE BUBBLERS	X	X	***	**	*	X
SPRINKLERS, SPRAYERS AND JETS*	X	X	**	**	***	X

* NOTE: Before converting an existing underground sprinkler system to RAINDRIP® sprinklers or jets, determine that the radius of throw of the RAINDRIP® product is compatible with the plant material to be watered. In most cases it is necessary for all portions of the zone to be covered by at least two sprinklers.

DEVICE SELECTION

Conversion device assemblies attach to 1/2" and/or 3/4" risers presently occupied by your shrub and flower sprinkler heads.

Figure out how many water outlets you will need. Plan on enough water outlets to wet at least 60% of the root ball of each plant. You may wish to consult the Rules of Thumb for various types of plant material to help you in this decision:

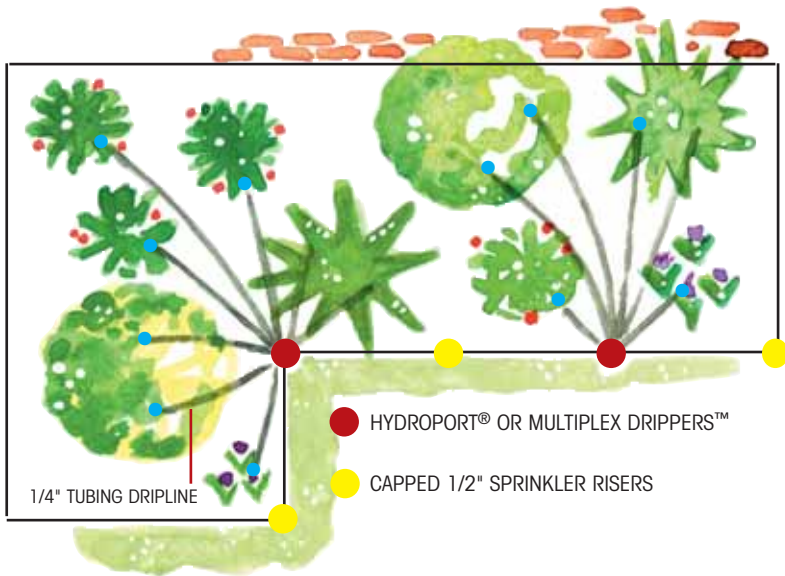
- Trees & Shrubs - Page 15
- Flower Beds & Groundcover - Page 18
- Vegetable Gardens - Page 20

See the chart above for the number of outlets each device offers.

For Hydroport™ Manifold & 6 outlet Manifold™ outlet points can be as much as 25 feet from the head on level ground (8 feet for Bubbler products & Multiplex Drippers). Swivel tee outlets (using PC Drippers or 1/2" Drip-A-Long®) can be up to 400 feet from the riser.

SAMPLE LAYOUT for CONVERSION DEVICES

EXAMPLE SHOWING 2 UNDERGROUND SPRINKLER RISERS CONVERTED TOMICRO WATERING DEVICES FOR PERIMETER PLANTS



NOTE 1: Conversion devices are not appropriate for planting areas that include turf (grass).

NOTE 2: If the pressure in your water supply system exceeds 60 PSI, conversion installations may require one or more pressure regulation devices. See Reducing Pressure on page 45.

Convert to efficient, effective micro watering



RAINDRIP® has conversion devices for virtually every application. This guide will instruct you in the basics of installing these water saving devices.

INSTALLATION for ALL PARTS

PREPARATION

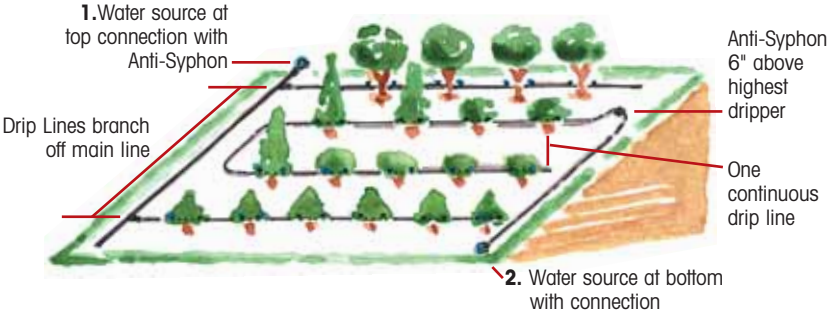
- Make a list of all the RAINDRIP® parts you will need to complete your installation. Don't forget to get a Hole Punch (part #R630C / 63100U) and also some Hole Plugs (part #R645C / 6460XX) just in case you make a mistake. If you are doing a conversion of underground sprinklers, don't forget the 1/2" threaded caps (not a RAINDRIP® product) that you will need to cap off unused sprinkler risers.
- Start your installation by placing your hose and tubing in a sunny spot. Allowing it to lay in the sun for about 30 minutes will soften it and make positioning easier. While the line is warming read through this entire installation section. Also read any additional RAINDRIP® installation information that may have been included with your purchase.
- A variety of installation approaches are possible. If you have a number of plant groups, you may wish to tackle each one separately and complete it before moving on to the next. Another method is to do all the water source connections first, then lay out all the hose and tubing and, finally, attach all the watering devices.
- Most people find it advantageous to start at the water-source connection and move downstream. See page 27 to help select the appropriate water- source connection for each circuit. Other than that, pick an approach that feels right and try it. Most mistakes are easily corrected, so relax, have fun, and enjoy the project.

GUIDELINES FOR HILLSIDE INSTALLATIONS

For hillside installations follow these three rules:

1. Route your dripper line on the uphill side of the plants.
2. If the elevation difference between the water source and the highest or lowest dripper will be more than ten feet use RAINDRIP PC Drippers™ only.
3. The water source may be at the top (1) middle or bottom (2) of the slope but the anti-syphon device must be located at least 6" above the highest dripper. This means that if your water source is at the middle or bottom, you must run the hose uninterrupted to the anti-syphon at the top before going to your first dripper location.

Note: Rule 3 does not apply if you have a Reduced-Pressure type anti-syphon device. (An expensive, commercial grade device not available from RAINDRIP®.)

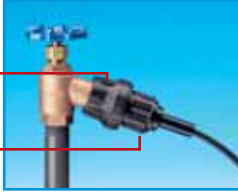


CONNECT TO THE WATER SOURCE

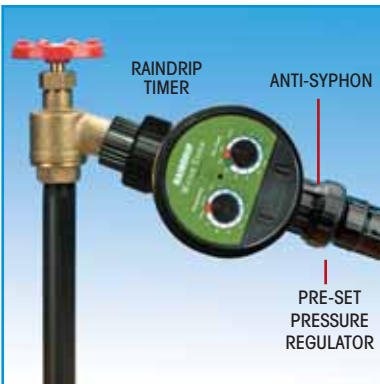
Connect the Automatic Timer (optional), Anti-Syphon (if required), Pressure Regulator, Filter & Swivel Adapter to the water source using one of the examples below as a guide.

BASIC HOOK-UP
for 1/4" Main line

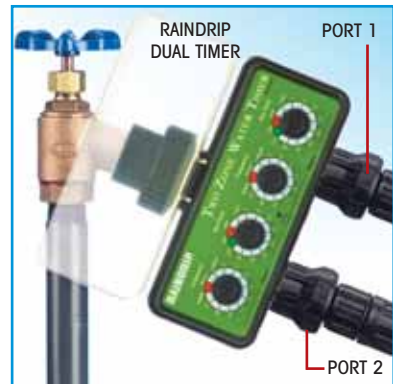
ANTI-SYPHON
&
1/4" TUBING
SWIVEL
ADAPTER



BASIC HOOK-UP
for 1/2" Main line
ANTI-SYPHON,
PRE-SET PRESSURE
REGULATOR &
1/2" HOSE SWIVEL
ADAPTER



HOOK-UP with AUTOMATIC
WATERING TIMER
(requires two AAA batteries)



DUAL STATION WATER TIMER
(requires two AA batteries)



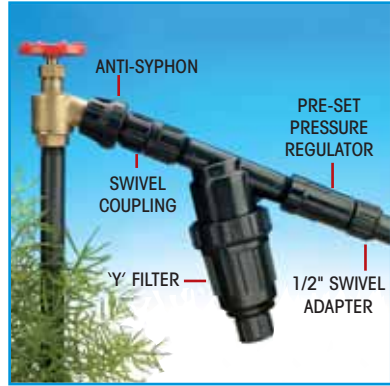
HOOK-UP with 'Y' DUAL
SHUT-OFF CONNECTOR

CONNECT TO THE WATER SOURCE

The “Y” filter can be used as a plant food applicator. Insert Raindrip Bloom & Grow tablets (R680CB) into the screen filter and turn on the water. The tablets will dissolve in about 20 minutes of run time. Repeat the loading process to meet the one tablet per emitter recommendation. Allow system to run an additional 5 minutes after the final application to clear the line. For best results, repeat the process every three weeks. See detailed instructions on the Bloom & Grow package.



HOOK-UP with AUTOMATIC
SPRINKLER ANTI-SYPHON



HOOK-UP with ‘Y’ FILTER &
FERTILIZING APPLICATOR

For your convenience in making connections, many Raindrip® parts are offered in a choice of thread combinations (male and female, pipe and hose thread). Make sure you choose compatible thread combinations or severe leakage may result. The thread type is noted on the package, card, or bin box that the part is displayed on. Remember that hose threads appear wider-spaced than pipe threads and pipe threads are slightly tapered. For best results always use Raindrip® brand parts. 10 GPH minimum flow required for pre-set regulators.

NOTE: There are many ‘hook-up’ options available for custom installations.
For help with installation questions call: 1-888-825-4716

LAYOUT MAIN LINE

Push the end of your Main Line hose or tube, using a pushing and twisting motion, about 1" into the Swivel Adapter. (If you are using 1/4" Tube as a Main Line, cutting the end at an angle will make it easier to insert in the swivel.) Next, lay your Main Line in position using just enough stakes and/or nailing clamps, as necessary, to hold it temporarily in place.

Allow the tubing to rest on the ground in the sun for 30 minutes to an hour before putting it in place. This will help it relaxed and make it much easier to work with. Uncoil the 1/2", 5/8" or .710" tubing by unwinding it in the opposite direction that it was originally coiled instead of trying to pull it out from the center of the coil.



LAY OUT BRANCH LINES

Next, in the same manner, lay your Branch Lines in position overlapping the Main Line an inch or so.

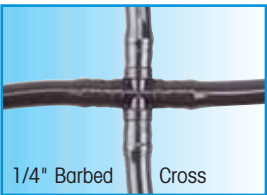
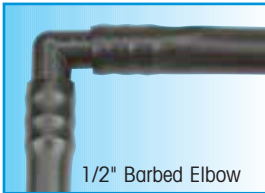
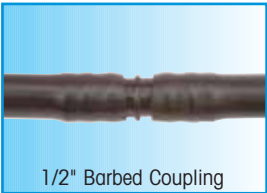
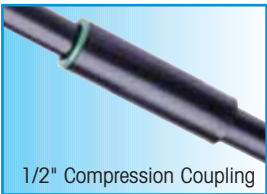


Put all your watering devices, stakes, nailing clamps, hole punch, pruning shears and remaining fittings into a container that is easy to carry. Move down each Branch Line installing devices and fittings as necessary.

Note: When laying out Main and Branch Lines for Sprinklers and Jets, keep in mind that the 1/4" tube that connects the sprinkler to the Main or Branch Line cannot be longer than 5'.

CONNECT HOSE & TUBING

Connect your hose and/or tubing using tees, couplers and elbows as required. See examples below. Use the RAINDRIP® Hose/Tubing Cutter (63200U) or pruning shears for cutting the hose and tubing. (A sharp knife may also be used.) Make straight, clean cuts and avoid getting dirt in the line. Insert the hose or tubing about 1" into the compression (barrel-shaped) fitting using a combination pushing and twisting motion. When using barbed fittings, be sure that all the barbs are completely covered by the tube. If it's a cool day and the line is stiff, dipping the end of the line in hot water will make it easier to connect. **Do not use oil or other lubricants to assemble the parts; it will deteriorate the line and fittings. Do not use glue.**



INSTALLING WATERING DEVICES

NOTE: For systems using only Drip-A-Long® hose or tubing, go to FINISHING UP on page 38.

How to install INDIVIDUAL DRIPPERS

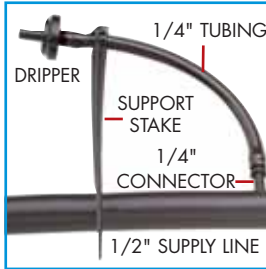
Use your Hole Punch where required to make ports in the Hose for On-line Devices or to connect a tubing branch.



Using PC, Flag, Button and/or Mini In-Line Drippers, connect them to the Hose or Tubing using one of the methods below.



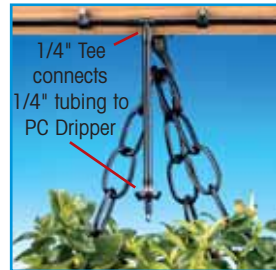
Button Dripper (also PC or Flag) connected to Main line via 1/4" leader line + support stake



Flag Dripper (also PC or Button) mounted directly on Hose / Main line

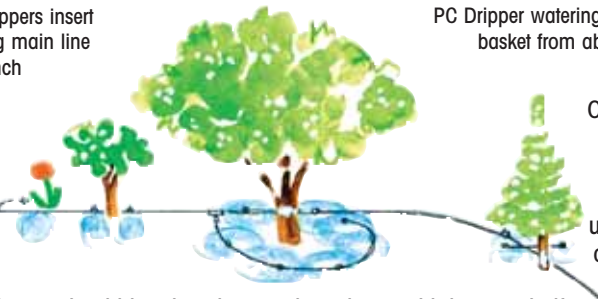


Mini In-Line Drippers insert into 1/4" tubing main line or branch



PC Dripper watering hanging basket from above

Use a sufficient number of drippers to wet at least 60% of the rootball of each plant.



On slopes, position Drippers on the uphill side of plants.

Drippers should be placed approximately one-third to one-half of the canopy radius out from the plant center.

How to install SPRINKLERS & JETS

Install the sprinklers on stakes or directly on lines using your Hole Punch and one of the methods shown below or the instructions that come with the product.

Jet/Sprinkler twists into top end of riser

4" rigid riser fits into the 8" Stake tightly

Using a twisting motion, push the branch of 1/4" Tubing onto the Barbed Connector and run through notch to secure

A variety of sprinklers, sprayers, jets and bubblers can easily twist into a riser and are ready for action

Flat top is easy to hammer into soil

13" sprinkler stakes are sturdy and easily installed and moved.

Jet/Sprinkler twists into top end of riser

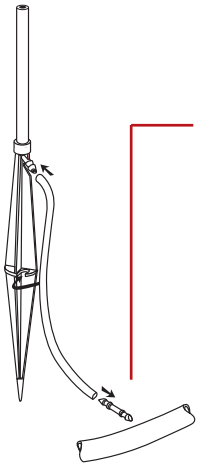
Adjustable 8" rigid riser



1/4" Barbed Connector attaches 1/4" tubing to the stake.



This barbed rigid riser can be inserted directly into Main line and secured with the galvanized 'Stub' Stake.

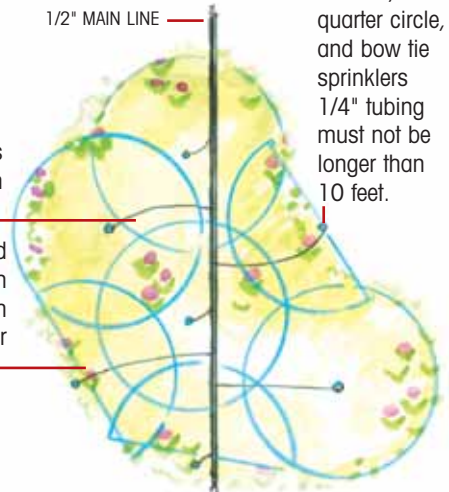


1/4" tubing attaches to barbed stake and connects to 1/2" Main line.

For full-circle sprinklers do not use more than 5 feet of 1/4" tubing.

For sprinklers mounted on stakes, run a length of 1/4" tubing from each unit to the Main or Branch Line.

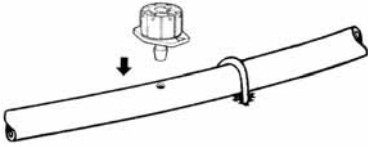
1/2" MAIN LINE



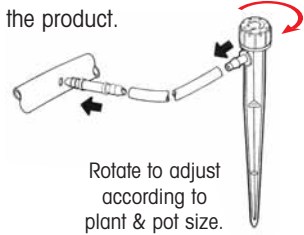
For half, quarter circle, and bow tie sprinklers 1/4" tubing must not be longer than 10 feet.

How to install ADJUSTABLE BUBBLERS

Connect your bubblers to 1/2" hose using a Hole Punch and one of the methods shown below or the instructions that came with the product.



For Bubblers with built-in stakes, run a length of 1/4" tubing from each Bubbler to the Main or Branch Line. Do not use more than 5 feet of tubing.



Rotate to adjust according to plant & pot size.



Bubbler mounted directly on 1/2" hose



Bubbler mounted directly on 1/2" riser adapter



Stake-mounted Bubbler connected to 1/2" Main Line with 1/4" tubing



Riser-mounted Bubbler connected to 1/2" Main Line with barbed connector

How to INSTALL MISTERS

Misters may be connected directly to 1/2" hose using a Hole Punch or to 1/4" tubing using a tee. Use one of the methods shown below or the instructions that come with the product.

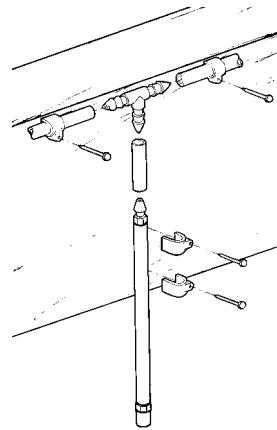
Misters require a minimum pressure to operate properly. For best results, use 25-50 PSI for Jet and Adjustable Misters and 35-50 PSI for Tornado Misters (eye protection recommended when installing nail-in clamps)



Adjustable Mister connected to 1/4" branch line for overhead use in hanging basket



Tornado Mister mounted on 4" Rigid Riser connected to Main Line / Hose



After installing all your watering devices, go to **FINISHING UP** on page 38.

INSTALLING CONVERSION DEVICES

For 1/4" Tap-Off go to page 41. For all other devices, start here:

Preparation

1. Remove all the sprinkler heads from the zone to be converted.



2. Flush out the zone to be converted through the risers until all the sediment is gone and the water runs clear.



3. Close off the risers not chosen for conversion with threaded caps. For a tight seal, use Teflon® tape on the male threads.



Installation of Hydroport™

4. Install devices on risers. Use Teflon tape on the male threads for a tight seal. Then, open all ports by using a coin and turning screws on top counterclockwise.
5. When device is connected to the riser, turn on the water and flush out the unit.
6. Push a length of RAINDRIP® 1/4" tubing onto each of the outlets you are using, all the way until it stops. Place the other end of the tubing at each of your watering locations.

NOTE: The device itself contains the flow controls. Do not put individual drippers at the ends of the 1/4" tubing. The maximum length for each 1/4" line on level ground is 25 feet. If you plan to bury the tubing later, allow a minimum of 1 foot of slack in each line but do not bury it at this time. Use 4" support stakes to anchor the ends of the tubing securely.

7. Regulate water flow by adjusting the screws with a coin, not a screwdriver. Do not over-tighten the screws.



Installation of Multiplex Drifter™, Multiplex Bubbler™, 4-Outlet Drip Star™ Bubbler & 6-Outlet Manifold



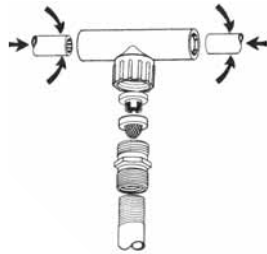
- Push a length of RAINDRIP® 1/4" tubing onto each of the outlet nipples you are using, all the way until it stops. Place the other end of the tubing at each of your watering locations.

NOTE: The device itself contains the drippers or flow controls. Do not put individual drippers at the ends of the 1/4" tubing. The maximum length for each 1/4" line on level ground is 15' for units with a flow rate up to 10 GPH and 25' for 20 GPH units. If you plan to bury the tubing later (recommended) allow a minimum of 1 foot of slack in each line but do not bury it at this time. Use 4" support stakes to anchor the ends of the tubing securely.

Installation of Swivel Tee or Swivel Elbow Assembly

(continued from Steps 1-2-3 on page 34)

- (1/2" Riser) Install the included thread adapter on the riser. Use Teflon tape on pipe thread connections for a tight seal. (3/4" Riser) Skip to Step 5.
- Insert the flow control into the filter washer and insert this assembly into the base of the swivel. Screw this assembly onto the riser, clockwise until tight. Use Teflon tape on the male threads for a tight seal. Do not over-tighten.
- Insert RAINDRIP® Hose or Drip-A-Long® into compression outlet(s) with a pushing/rocking motion and proceed with installation of Watering Devices beginning on page 31.



Installation of 1/2" Riser Adapters

(continued from Steps 1-2-3 on page 34)



4. Insert the filter washer (if included) into the riser adapter and screw this assembly onto the 1/2" riser, clockwise until tight.

Use Teflon tape on the male threads for a tight seal. Do not over-tighten.

5. For Sprinklers, Jets, and Bubblers proceed with installation of Watering Devices beginning on page 31.

6. For Dual Port Adapter Install RAINDRIP® 1/4" Tube or 1/4" Drip-A-Long® onto barbed outlets with a pushing / rocking motion and proceed with installation of Watering Devices beginning on page 31.

After installing all your watering devices,
go to **FINISHING UP** on page 38.

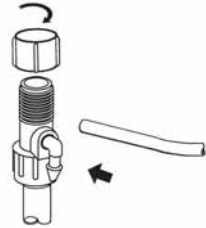
Installation of 1/4" drip line tap-off

If you have a few isolated plants that would benefit from drip and are located near an operating sprinkler system, the Tap-Off may be the solution. Make sure the watering schedule for the plants to be dripped is compatible with the remaining plants serviced on the existing sprinkler zone. For example, plants in containers generally require short watering periods and therefore may be incompatible with plants watered by sprinklers.

1. Insert the included filter washer into the 1/4" Tap-Off and screw this assembly onto the 1/2" riser, clockwise until tight.
Use Teflon tape on the male threads for a tight seal. Do not over-tighten.



2. Close off the top of the tap-off using a threaded PVC cap, or re-attach the sprinkler head. Cap nut included.



3. Cut the 1/4" tubing straight and clean cuts. Push the 1/4" tubing on the barbed outlet of the tap-off using a pushing motion until tubing is secured on the barb. proceed with the installation of Watering Devices beginning on page 31.



FINISHING UP

PREPARATION



1. Remove any End Clamps or End Caps you may have installed.
2. (SPRINKLERS & JETS ONLY) Remove sprinklers and jets from the tops of stakes or adapters (Leave stakes and adapters in place).

FLUSHING



3. Turn on the faucet and flush out any dirt that may have gotten into the line during installation. Continue flushing until water runs clear.

NOTE: FOR SPRINKLERS & JETS
Allow water to spout from sprinkler outlets, then turn off the water and reinstall sprinklers and jets.

CLOSE OFF



4. With the water still running, close off the ends of the 1/2" hose and 1/2" Drip-A-Long® lines using a 1/2" hose end clamp, 'Figure 8' or 1/2" compression end cap & plug.



5. Close off 1/4" tubing and 1/4" Drip-A-Long® lines with 1/4" tubing end clamps.

TEST

Turn on the water once again and check for leaks or clogged watering devices.

See **TROUBLE SHOOTING** on page 40 for solutions to the most common problems.

USING YOUR SYSTEM

BURY LINES (OPTIONAL)

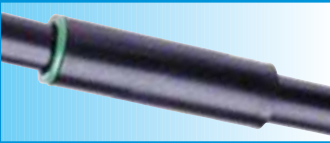
After you are sure everything is working correctly, you may bury the hose and tubing 4" to 6" if you wish to keep it out of sight and help prevent it from being displaced by rakes or other gardening implements. If you do so, make sure you make a drawing of your layout to avoid damaging the lines if you need to do some digging at a later date.

CORRECTING MISTAKES



Sizes

If you don't know what size the tubing is, use the Stretch 'n Lock fitting.



Hose or Tubing

If you cut the hose or tubing in the wrong place, simply insert a compression coupler or barbed connector and continue with your layout.



Watering Devices

If you put a watering device or 1/4" barbed connector in the wrong place in the 1/2", 5/8" or .310" hose, simply replace the device or connector with a hole plug and punch a new hole in the correct location.



All RAINDRIP® kits, carded and bagged items come with easy-to-follow illustrated installation instructions.

TROUBLE SHOOTING

Problem	Cause / Solution
Leaks	A B C G I
Insufficient Flow	A E F H
Too much flow	C
Tubing Blows Off	A B C
Clogged Watering Devices	E H
Vibrating Pressure Regulator	C D
Insufficient spread of water in soil	J

SOLUTIONS

	Possible Cause	Recommended Solution	Reference
A	Fitting not fully seated	Reconnect properly	See page 30
B	Wrong size fitting for tubing	Install correct fitting size for tubing	Fitting size is stamped on colored tubing insert
C	Excessive pressure	Reduce pressure	See Reducing Pressure on next page
D	Too few watering devices	Add watering devices	Check minimum flow rating for pressure regulator
E	Dirt or other foreign matter in system	Clean filter, replace clogged devices, flush system	See page 42
F	Crimp in tubing	Straighten tubing	
G	Wrong thread combination	Check for mismatch of pipe and hose threads	Hose threads appear wider spaced. Pipe threads are slightly tapered
H	Filter clogged, damaged or missing.	Clean and/or replace filter element	See package instructions
I	Pipe threads not sealed	Disassemble pipe thread connection and reassemble using teflon tape or teflon paste	
J	Loose soil	Change to a watering device with a higher flow rate	

REDUCING EXCESSIVE PRESSURE

The maximum inlet pressure for all RAINDRIP® systems is 60 PSI.

To reduce pressure at a faucet connection:

- Turn the faucet handle clockwise to reduce the flow and the equivalent pressure.*



OR

- Install a preset or adjustable pressure regulator.

10 GPH
minimum
flow required
for pre-set
regulators.



OR

- Install a 10, 30, 60 or 90 GPH Pressure Compensating Flow Control under the existing washer in the female end of the Swivel Adaptor being used for size of supply tubing used in the system. Controls pressure of up to 140 psi, and allows the right amount of water needed into the system.



PRESSURE COMPENSATING
FLOW CONTROL



SWIVEL ADAPTOR FOR
1/2" - .710" TUBING



SWIVEL ADAPTOR FOR
1/4" TUBING

To reduce pressure at an anti-syphon valve connection:

- Manual System — Turn the handle clockwise to reduce the flow and the equivalent pressure.*
- Automatic System — Turn the flow control screw on top of the actuator clockwise to reduce the flow and the equivalent pressure.



*Note: If your water source pressure varies, frequent adjustment may be required. Consult a plumber to solve this problem or install a pressure regulator as shown.

WATERING STRATEGY

The exact duration and frequency of watering depends on the temperature, wind conditions, soil type and plant variety. For example; more mature plants have deeper roots and therefore require a longer duration watering cycle, arid areas will require more frequent watering. Since the water is applied much more slowly with a micro watering system, the watering times will be much longer than you may be used to. But, if you grouped your plants properly when you planned your system you should have no trouble arriving at the proper watering schedule through experimentation. Consult your nursery person or RAINDRIP® dealer for additional information.

Remember that drip systems water the root zone not the ground surface and apply the water at the rate the soil can accept it. Visible puddling is not an indication of proper watering. A rule of thumb is to water as soon as the top inch of soil next to the plant feels dry when you wiggle your finger into it. You may operate dripper circuits in the day or evening since the water is placed at the base of each plant, not on the foliage. Spray circuits should be operated in the early morning, before sunrise if possible.

WEATHER, DURATION & FREQUENCY OF WATERING

	Cool Time (hours)	Days per week	Warm Time (hours)	Days per week	Hot Time (hours)	Days per week
Vegetables & Flowers	2	1-2	3	2	4	3
Vines & Shrubs	2	1-2	3	2	4	3
Shrubs & Trees 3-5 ft.	4	1-2	5	2	6	3
Shrubs & Trees 5-10 ft.	6	1-2	7	2	8	3
Trees 10-20 ft.	6	1-2	8	2	10	3
Containers	(10 min.)	1-2	(20 min.)	2	(30 min.)	3

Fertilizing

Use RAINDRIP® Bloom & Grow Plant Food tablets (R680CB). You can apply any slow release water soluble fertilizer automatically using a RAINDRIP® 'Y' Filter (601004, 604004 or R605D). See the instructions included with these devices.

Maintenance

Once or twice a year remove the end closures and flush each circuit until the water runs clear. In addition, clean the filter screens and check for leaks.



WINTERIZING YOUR RAINDRIP SYSTEM

If you live in an area that has freezing temperatures and/or hard frosts it will be necessary for you to **completely drain** your drip system to prevent the lines and other parts that contain water from being damaged or splitting.

Before the first frost or freeze, open the ends of all of your 1/2" or larger polyethylene tubing and disconnect the tubing from the water faucet or valve. The tubing and the emitters can be left out for the winter, but the system must be drained.

Allow gravity to drain all of the water out of all of the tubing. You can assist gravity by lifting the lines at the mid point to help the water drain out. If gravity does not do a complete job you may wish to have a professional use **low-pressure** compressed air, (no more than 30 PSI), to "blow out" the system.

A little water in the lines will be OK. The polyethylene tubing is more flexible and forgiving than hard lines such as PVC or metal piping.

When you are satisfied that the lines have been drained, we suggest that you close off all the open ends of the lines. This will keep them free of debris and insects, and will make Spring start-up easier for you.

Next, remove the water source (faucet/valve), hook up parts including your battery-operated Electronic Timer and the Y Filter, if you have them. Remove the batteries from the timer.

If you have any questions about winterizing or anything else concerning your drip system please call toll free 1-888-825-4716, or send an e-mail to raindrip@raindrip.com

PRE-SEASON SPRING CHECK-UP

It is always a good idea to check your system needs for the new season. If cabin fever has set in, getting ready to restart or “boot” your drip system will be good therapy.

Be sure the danger of frost and freezing conditions is over before starting the intravenous infusion of water into your drip system.

If you are using battery-operated timers, replace the batteries and give everything a test run.

Flush the system to be certain no dirt or other debris has made its way into the lines during the winter hibernation.

During the test run, check the entire system for any leaks or damaged tubing. You may be able to stop any leaks in the 1/2” or larger tubing using a hole plug. If the hole is too big for a hole plug, or the leak is in the 1/4” tubing, then merely cut out the bad section and rejoin the tubing with a straight connector. If the repair section is too long for one connector, then put in a new section of tubing using two straight connectors.

Check the drippers, sprinkler/sprayers, and misters. Replace any that may not be working.

If you see a build up of calcium or lime deposits in your parts, you may be able to remove it up by soaking the parts in vinegar or other stronger products. Be cautious with the stronger types of solutions. Wear protective eye wear and gloves and always follow the label instructions.

Now you can relax and concentrate on planning or reviving your garden.

Call or e-mail regarding your system.

Toll free 1-888-825-4716, e-mail raindrip@raindrip.com

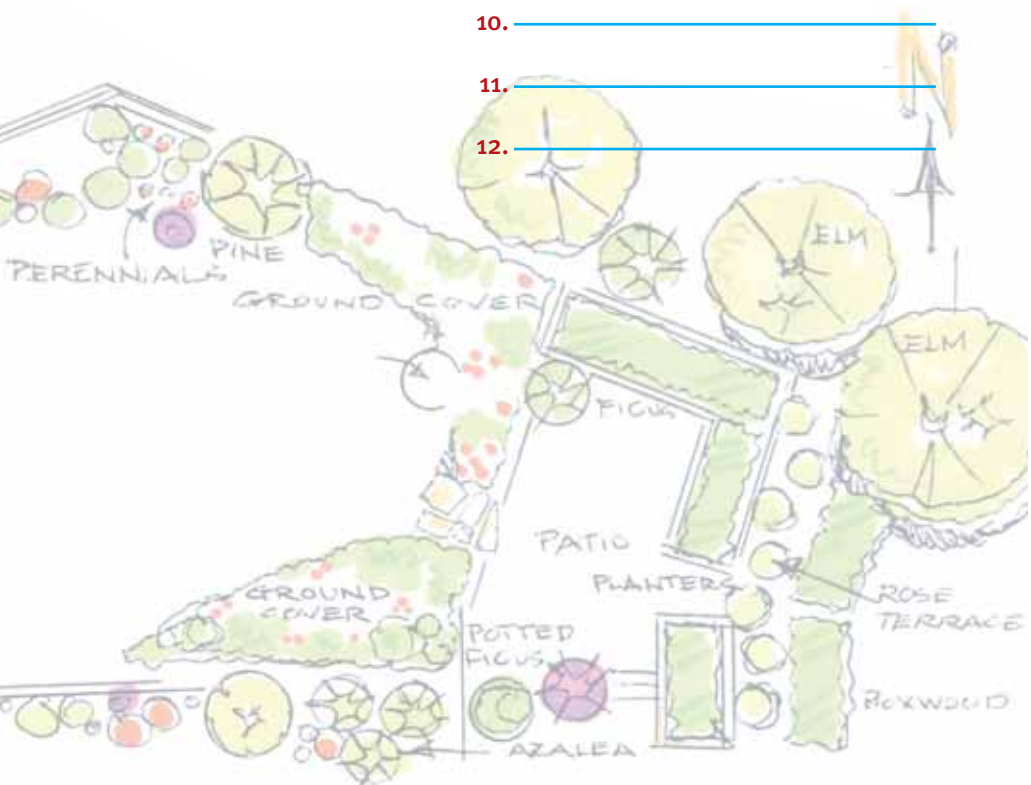
INSTALLATION TIPS

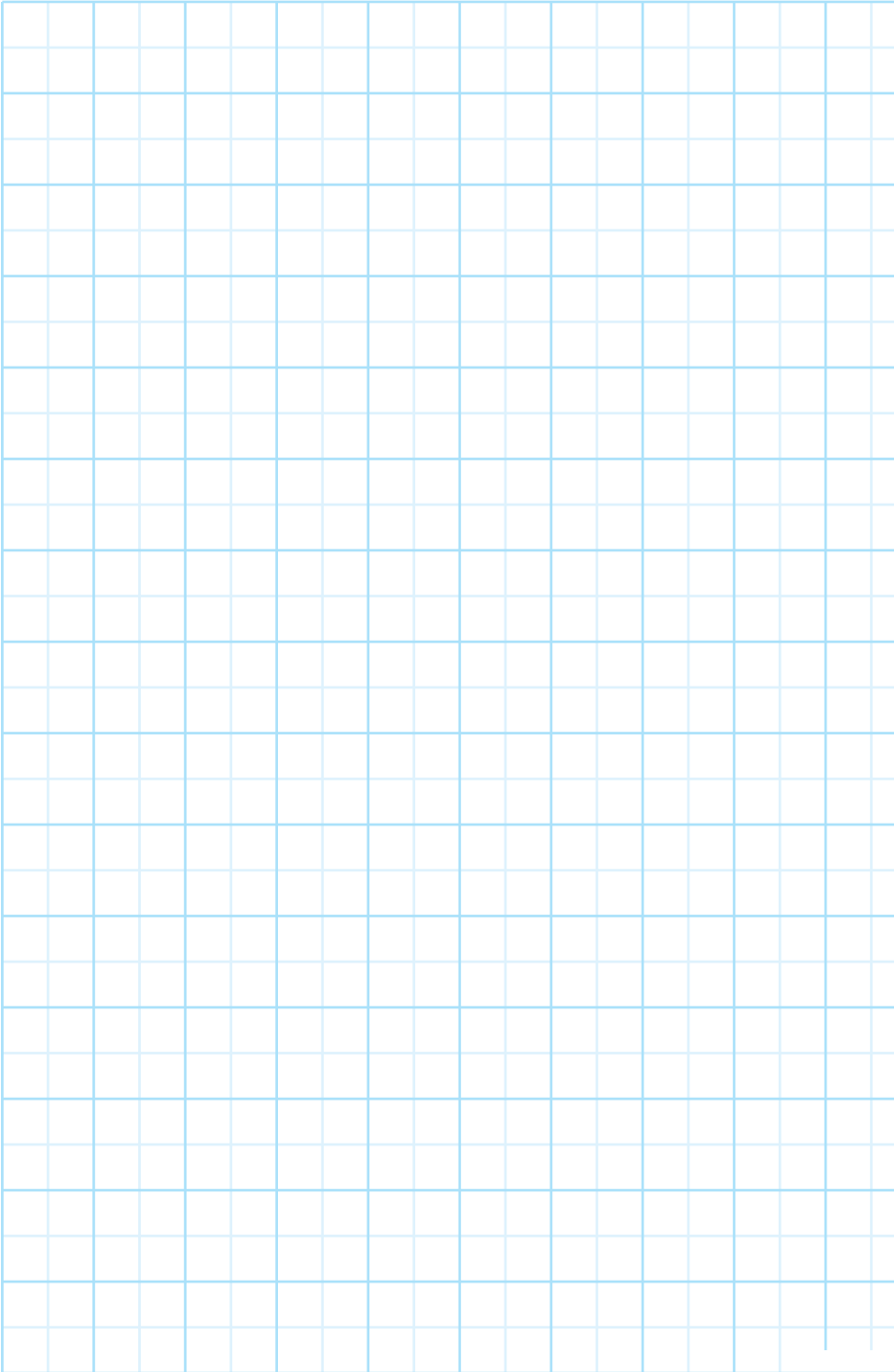
Here are a few tips that will make your installation project easier.

- Uncoil the 1/2", 5/8" or .710" tubing by unwinding it in the opposite direction that it was originally coiled in instead of trying to pull it out from the center of the coil.
- When using compression fittings cut the polyethylene tubing at a slight angle (approximately 10 or 15 degrees) then push it into the tubing.
- Allow the tubing to rest on the ground in the sun for 30 minutes to an hour before putting it in place. This will help it relax and make it much easier to work with.
- Know what your layout plan will be beforehand and refer to it often so you get your system right where you want it.
- If you are installing a kit, refer to the suggested layouts on the box and/or to the instructions in the kit. Then compare them to your layout plan. Make adjustments as needed.
- Put your gloves, cutter, stakes, hole punch, sprinklers, drippers, fittings, and other small parts, including hole plugs, in a bucket or other handy container for ease of handling.
- Start your installation at the water source and work downstream.
- Lay out the tubing lines according to your plan or the kit plan, but do not connect them yet. Step back and check to make sure it is where you want it to be. Once satisfied, make the connections.
- Be certain to flush out the system before installing the drippers or sprinkler/sprayers.
- It is much easier to make up your lateral lines with drippers or sprinkler/sprayers, etc., before connecting them to the main supply line.

Checklist:

1. Hose cutters / shears
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____





The Drip Watering Made Easy is the most comprehensive, yet easy-to-comprehend, easy-to-use guide available to the home gardener.

The guide is divided into 3 sections to help you quickly find the information you need for your project:

GENERAL PLANNING

- Benefits & Advantages
- Diagram of Basic Components of a System
- Watering Devices Parts List
- Landscape Planning Layout
- Quick Start Chart

PLANNING INFORMATION & LAYOUTS FOR WATERING SPECIFIC PLANT GROUPS

- Trees & Shrubs
- Flower Beds & Ground Cover
- Vegetable Gardens
- Container & Patio Plants
- Conversion from Conventional Sprinklers to Micro Watering Systems

INSTALLING & USING YOUR SYSTEM

- Installation of specific parts
- Guidelines
- Troubleshooting Tips

RAINDRIP® has drip watering experts to help you with any questions. Just call 888-825-4716 or email raindrip@raindrip.com

All rights reserved. No parts of this book may be reproduced or transmitted in any form or by any means: electronic, mechanical, photocopying or otherwise without the prior written permission of RAINDRIP, Inc. For information contact:

RAINDRIP, Inc.
337 West Bedford, Fresno, California 93711 U.S.A.
www.raindrip.com • raindrip@raindrip.com



RAINDRIP, Inc. ® Drip Watering Made Easy No. R720L
©2007 RAINDRIP, Inc. RAINDRIP is a subsidiary of NDS.

