

TORO

Count on it.

Drip In[®] Classic[®]

Turbulent Flow Dripline

Ag Irrigation



Application:

Drip In[®] Classic[®] is the most effective and economical choice for most permanent and row crop applications. The hose with the integral in-line emitter, is rugged and lightweight for easy installation and retrieval. The in-line emitter with its proven turbulent flow path design and raised inlets, offer high resistance to clogging for the most demanding of applications.

Improved Crop Yield and Quality

- Water distributed evenly over all rows in the irrigated area.
- Less weeds from surface water.
- Precise application of fertilizers.
- Better control of plant stress.
- Harvest timing becomes controllable.
- Crops can be irrigated during harvesting to maximize total yield.

Cultural Cost Benefits

- Less irrigation water applied during growing season.
- Quantity of fertilizers can be reduced.
- Reduced labor costs for irrigation and harvesting.

Drip In[®] Classic[®]

The growers most economical choice for vineyards, orchards, and row crops.

Drip In® Classic® Dripline

Advantages:

- Highly clog-resistant due to wide, deep turbulent passageways and raised inlets.
- Dual-opposed outlets.
- Extremely accurate flow rate due to high quality control standards.
- Reduced labor and installation cost. No hole punching, lost emitters or handling damage.
- Lower friction loss due to jointless design, allows longer runs and fewer mainlines.
- Flow rate can be varied for crop requirements.
- For above and below ground applications.*
- Emitters are factory spaced, thus requiring no field installation (hole punching, clip-ons, etc.).

The In-line Emitter is a labyrinth type, turbulent flow dripper. The emitter is enclosed and inseparably welded to the inside wall of the tubing as it is extruded in the manufacturing process. This emitter has enjoyed over 20 years of reliable performance in a variety of applications.

Classic® Dripline is a one piece, jointless emitter enclosed tube. It is rugged, lightweight and very flexible. It can be laid out and re-rolled easily with no damage to the in-line emitters. Only the highest quality resins are used. Drip In® dripline is the most effective and economical choice for permanent or row crops. Classic dripline now comes with the Toro Ag Irrigation **Blue Stripe®** of quality.

High Speed Installation and Removal

In addition to high speed layout and recovery, tractor-mount spindle reels provide convenient storage between seasons, plus easy shipment and handling. Built-in emitters make Drip In® the ideal dripline for quick, damage-free re-rolling through dense crops.

Reel Dimensions:

6.5' diameter x 30" width
(2 meters x .76 meters)

Note: Fits 3 1/8" diameter shaft

Reel Capacity:

16 mm dripline - 25,000'

18 mm dripline - 20,000'

20 mm dripline - 15,000'

* For subsurface applications, we recommend Drip In with **ROOTGUARD®**

The Drip In® Emitter



inserted in the tube...



becomes a permanent part of it.



Emitter Performance Tests

In two unsolicited independent engineering analysis (Boyle Engineering and C.I.T.), Drip In® emitters were found to have uniformity of 98%, and a manufacturers coefficient of variation of 0.014, ranking best of all manufacturers. Drip In® emitters were totally unaffected by temperature variations.

Other Drip In® Products

Drip In® Clipperline®

Drip In dripline comes factory-installed with clip rings.

- Dramatically reduces labor and installation time in the field.
- Unique engineering plastics provide unparalleled strength on the wire.
- Superior control of water placement by directing water droplet to the plant.
- Low profile for mechanical harvesting.
- Works with 14 gauge wire.

With Clipperline, we do the work in the factory to save you time, labor and money in the field.

Drip In® with ROOTGUARD®

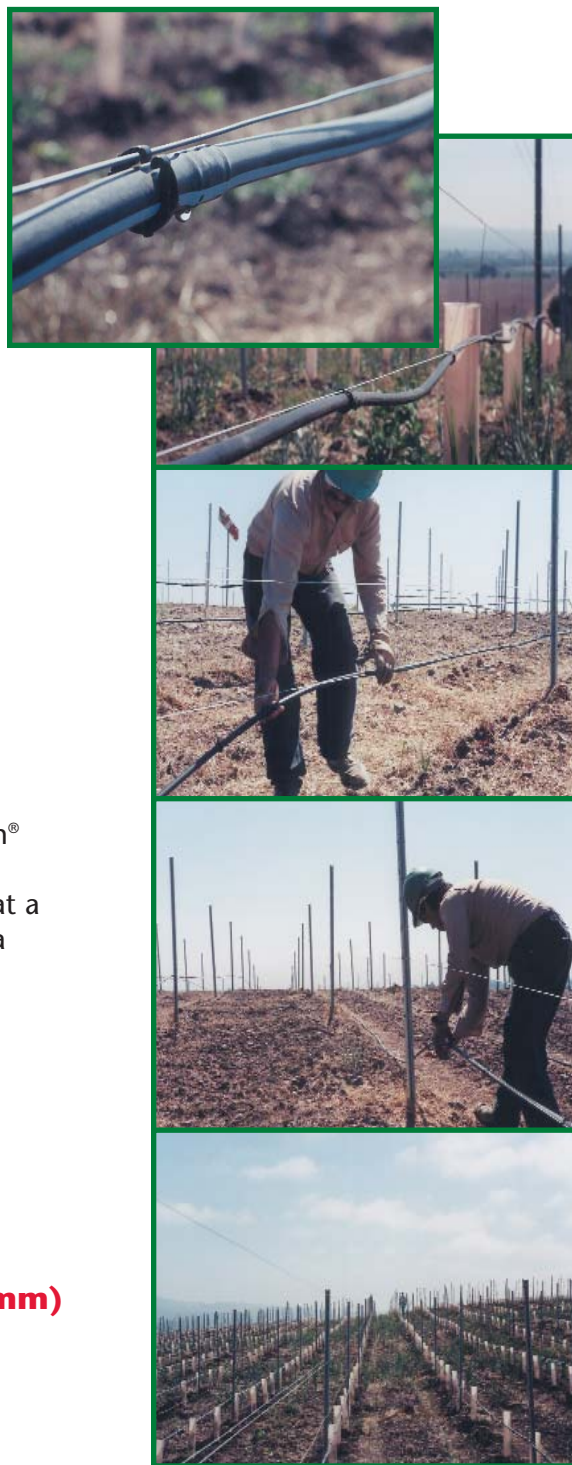
Drip In Dripline is also available with **ROOTGUARD** protection. **ROOTGUARD** technology combines Treflan® with the drip emitter to inhibit root growth. This is a patented technology where the herbicide is released at a uniform rate over a long period of time. It maintains a sufficient concentration in the soil immediately surrounding the drip emitter, to prevent root growth into the dripper.

Drip In® PC Dripline

Pressure compensating dripline for use in adverse topographical and operating conditions.

Drip In® Soaker Dripline 1/4" (6mm)

Classic (non-compensating) dripline for greenhouse, nurseries and other small applications.



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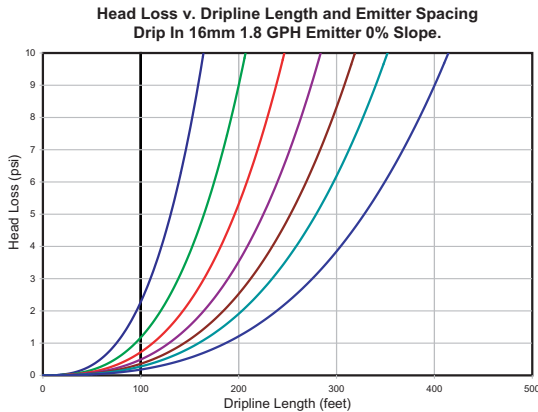
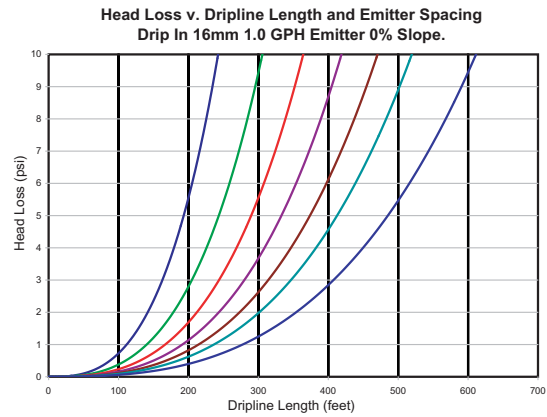
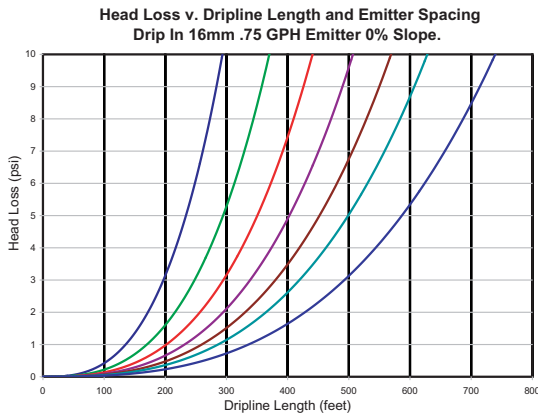
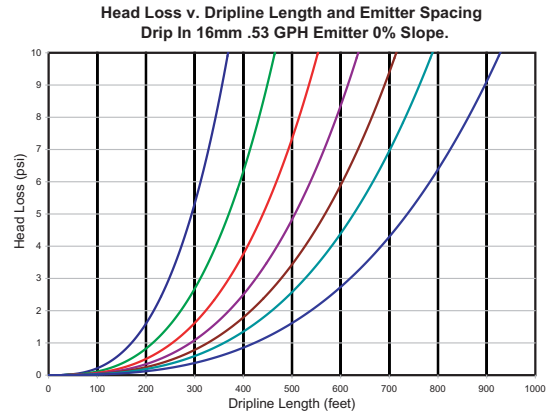
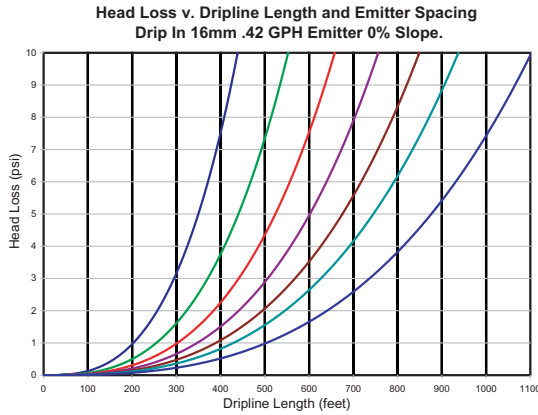
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TORO

Count on it.

0.550" (16mm) Drip In® Classic® Dripline

18" 24" 30" 36" 42" 48" 60"



Flow Rate vs. Pressure

Emitter Flow GPH @ 15 psi	Color of Emitter	Pressure (psi)						
		10	15	20	25	30	35	40
0.42	Black	0.34	0.42	0.49	0.55	0.60	0.65	0.70
0.53	Black	0.43	0.53	0.62	0.69	0.76	0.82	0.88
0.75	Brown	0.61	0.75	0.87	0.97	1.06	1.15	1.22
1.00	Green	0.81	1.00	1.16	1.31	1.44	1.57	1.68
1.80	Blue	1.46	1.80	2.09	2.35	2.58	2.80	3.00

Color Coding of Emitter is as shown.

0.550" I.D./0.640" O.D./0.045" Wall

16mm Dripline Run Length

Emitter Spacing		Maximum Run for a Flow Variation ±5%																				
		0.42 gph		1.5 lph		0.53 gph		2.0 lph		0.75 gph		2.8 lph		1.0gph.		3.78 lph		1.80 gph		6.81 lph		
Inches	Centimeters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	
18"	45	315	96	254	77	201	61	165	50	125	38											
24"	60	390	119	317	97	254	77	205	62	150	46											
30"	75	434	132	374	114	300	97	228	69	172	52											
36"	90	515	157	428	130	345	105	270	82	205	62											
42"	105	575	175	478	146	392	119	300	91	225	69											
48"	125	630	192	526	160	428	130	330	101	250	76											
60"	150	735	224	616	188	474	144	385	117	290	88											

Flow Discharge Equations

$$0.42 = 0.103 P^{0.52}$$

$$0.53 = 0.130 P^{0.52}$$

$$0.75 = 0.194 P^{0.50}$$

$$1.00 = 0.238 P^{0.53}$$

$$1.80 = 0.440 P^{0.53}$$

Q = Flow rate (gph)

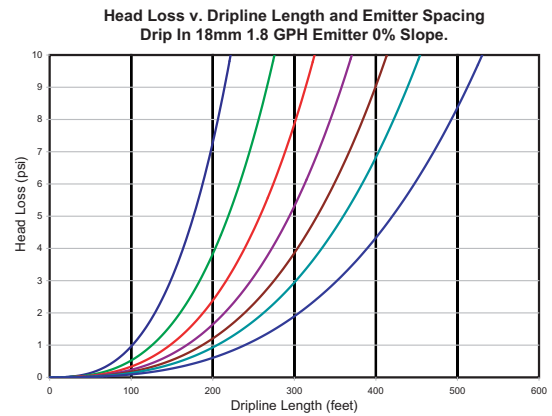
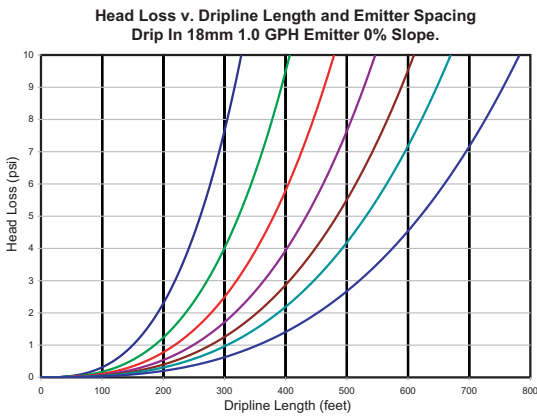
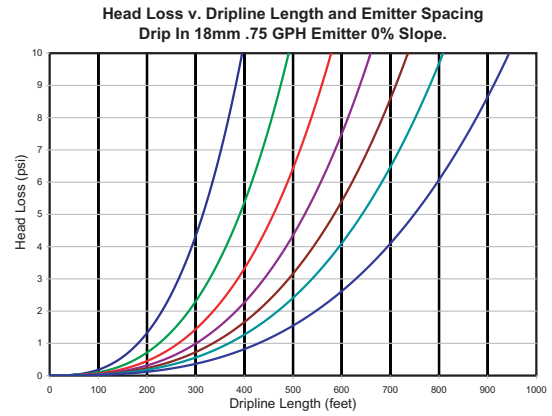
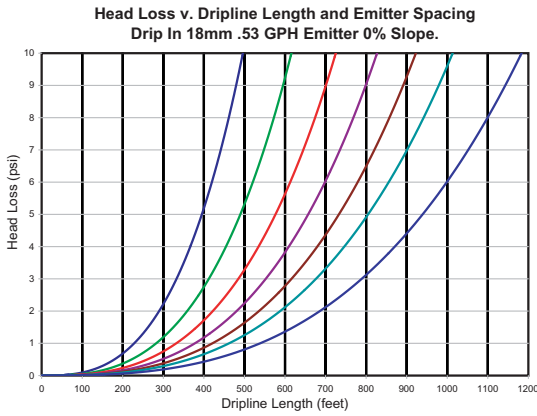
P = Operating Pressure (psi)

Barb Loss Factor (kd) 0.90



0.620" (18mm) Drip In® Classic® Dripline

18" 24" 30" 36" 42" 48" 60"



Flow Rate vs. Pressure

Flow Discharge Equations

$Q = \text{Flow rate (gph)}$
 $P = \text{Operating Pressure (psi)}$
 $\text{Barb Loss Factor (kd)} = 0.40$

$0.53 = 0.130 P^{0.52}$
 $0.75 = 0.194 P^{0.50}$
 $1.00 = 0.238 P^{0.53}$
 $1.80 = 0.440 P^{0.52}$

Emitter Flow GPH @ 15 psi	Color of Emitter	Pressure (psi)						
		10	15	20	25	30	35	40
0.53	Black	0.43	0.53	0.62	0.69	0.76	0.82	0.88
0.75	Brown	0.61	0.75	0.87	0.97	1.06	1.15	1.22
1.00	Green	0.81	1.00	1.16	1.31	1.44	1.57	1.68
1.80	Blue	1.46	1.80	2.09	2.35	2.58	2.80	3.00

Color Coding of Emitter is as shown.

0.620" I.D./0.710" O.D./0.045" Wall

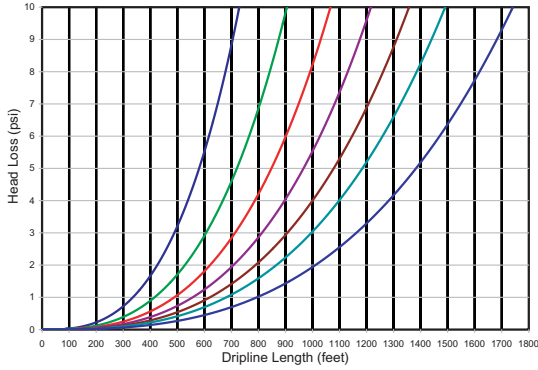
18mm Dripline Run Length

Emitter Spacing		Maximum Run for a Flow Variation ±5%							
		0.53 gph		0.75 gph		1.0 gph		1.80 gph	
Inches	Centimeters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters
18"	45	330	101	265	81	225	69	151	46
24"	60	410	125	330	101	282	86	186	57
30"	75	460	140	310	119	322	98	217	66
36"	90	545	166	444	135	369	112	250	76
42"	105	620	189	497	151	410	125	276	84
48"	125	670	204	544	166	452	138	304	93
60"	150	775	236	635	194	524	160	355	108

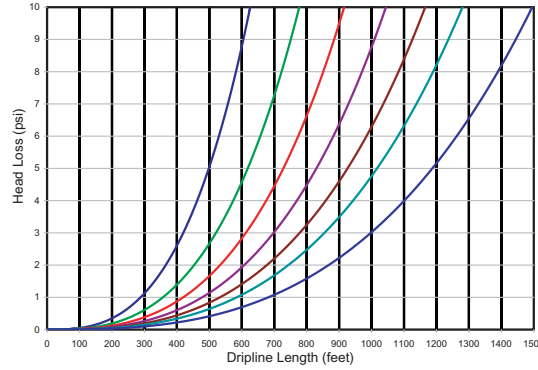
0.710" (20mm) Drip In® Classic® Dripline

18" 24" 30" 36" 42" 48" 60"

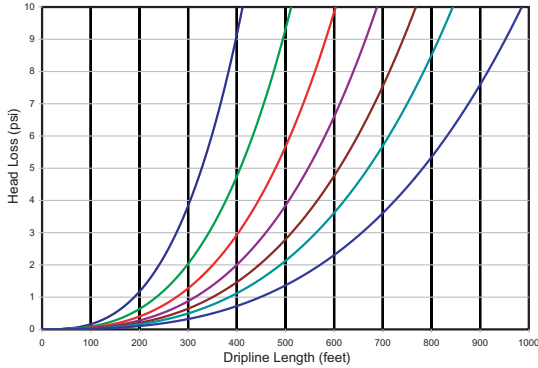
Head Loss v. Dripline Length and Emitter Spacing
Drip In 20mm .42 GPH Emitter 0% Slope.



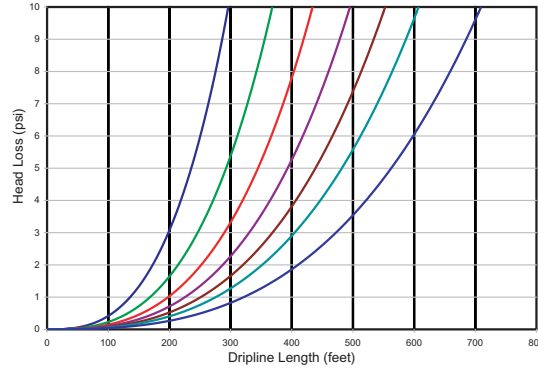
Head Loss v. Dripline Length and Emitter Spacing
Drip In 20mm .53 GPH Emitter 0% Slope.



Head Loss v. Dripline Length and Emitter Spacing
Drip In 20mm 1.0 GPH Emitter 0% Slope.



Head Loss v. Dripline Length and Emitter Spacing
Drip In 20mm 1.65 GPH Emitter 0% Slope.



Flow Discharge Equations

Q = Flow rate (gph) $0.42 = 0.103 P^{0.52}$
 P = Operating Pressure (psi) $0.53 = 0.130 P^{0.52}$
 Barb Loss Factor (kd) 0.35 $1.00 = 0.238 P^{0.53}$
 $1.65 = 0.404 P^{0.52}$

Flow Rate vs. Pressure

Emitter Flow GPH @ 15 psi	Color of Emitter	Pressure (psi)						
		10	15	20	25	30	35	40
0.42	Black	0.34	0.42	0.49	0.55	0.60	0.65	0.70
0.53	Black	0.43	0.53	0.61	0.68	0.75	0.81	0.87
1.00	Green	0.81	1.00	1.16	1.31	1.44	1.57	1.68
1.65	Brick Red	1.34	1.65	1.92	2.15	2.37	2.56	2.75

Color Coding of Emitter is as shown.

0.710" I.D./0.805" O.D./0.045" Wall

20mm Dripline Run Length

Emitter Spacing		Maximum Run for a Flow Variation ±5%													
		0.42 gph		1.5 lph		0.53 gph		2.0 lph		1.0 gph		3.78 lph		1.65 gph	
Inches	Centimeters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters
18"	45	480	146	395	120	271	83	201	61						
24"	60	595	181	493	150	338	103	246	75						
30"	75	675	206	582	177	397	121	292	89						
36"	90	790	241	666	203	453	138	327	100						
42"	105	880	268	744	227	507	155	367	112						
48"	125	965	294	820	250	556	169	404	123						
60"	150	1120	341	958	292	170	170	445	136						

