

SPRINKLER SYSTEMS DESIGN GUIDE

**AUTOMATED WATERING SYSTEMS
FOR GREENHOUSE AND NURSERY**

NETAFIM'S SPRINKLERS GIVING YOU UNIFORM COVERAGE



SpinNet
Sprinkler



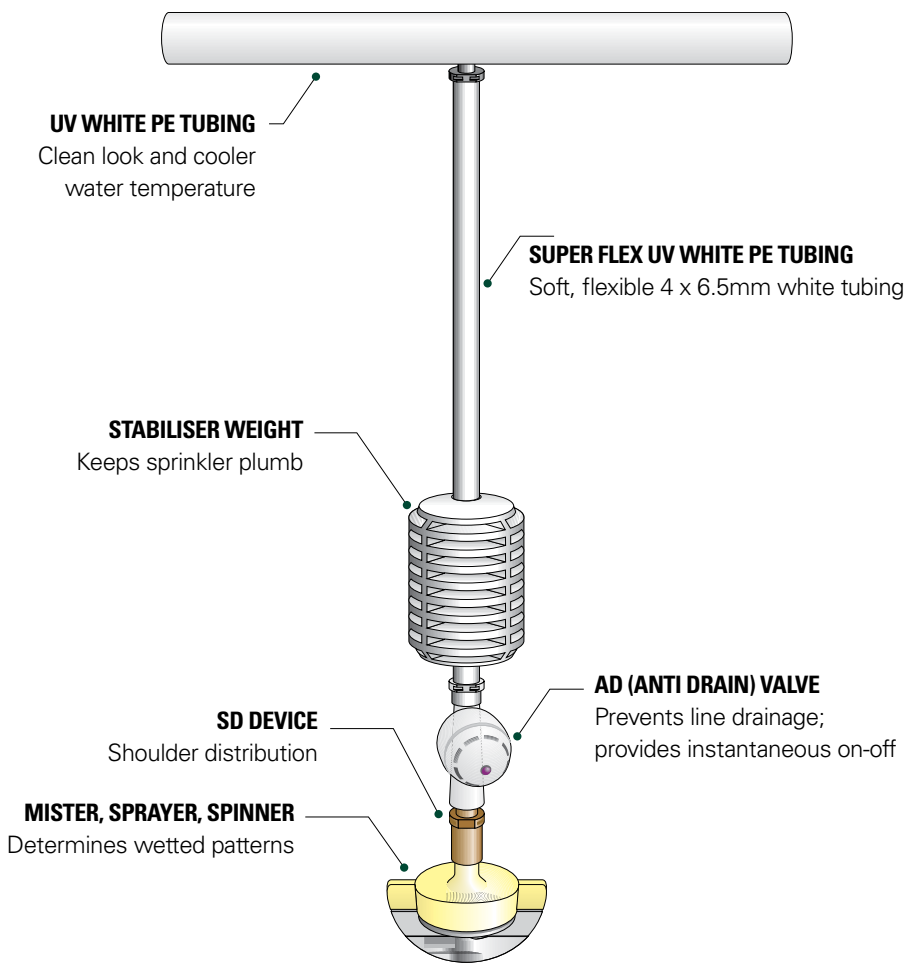
VibroNet
Sprinkler



CoolNet Pro
Superfine Mister
(Grey Nozzles)



WHY NETAFIM SYSTEMS ARE BETTER



LOW COST AND FAST PAYBACK

Payback for a complete system is usually within the first season of operation.

DRIP-LESS SPRINKLERS

SpinNet Sprinkler offers drip-less operation - the plants below are not damaged from water dripping off the sprinkler.

Check Valve prevents the sprinkler line from draining onto the plants below after shut-down and provides instantaneous on-off for accurate short cycle watering and misting.

Sprinklers hang below the supply pipe, preventing wetting of the pipe and dripping onto the plants below.

HIGHLY UNIFORM WATERING

Increases crop uniformity.

HIGHLY DURABLE

Made from the highest quality plastics with excellent Ultra-Violet (UV) resistance. Our reflective co-extruded white tubing is completely opaque to prevent algae growth, UV resistant, and can withstand heat, direct sun and harsh chemicals.

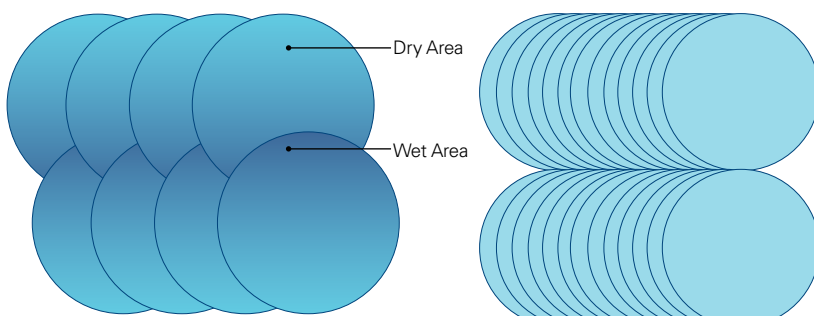
LOW MAINTENANCE

All sprinkler parts can be assembled and disassembled in the greenhouse without tools.

UNIFORM COVERAGE

Traditional sprinkler layout spaces the sprinklers 'head to head' or at a spacing equal to the radius of the sprinkler throw. For larger areas, the patterns are overlapped creating both wet and dry areas.

The Netafim solution avoids the problems of the traditional sprinkler layout and achieves a high level of uniformity within a closely spaced 'strip of sprinklers'. By designing with these 'strips' laid out side by side, large areas can be covered uniformly.



Traditional "Head to Head" sprinkler overlap. Inconsistent coverage patterns.

Netafim two line solution. Uniform Coverage.



DESIGN GUIDE FOR SPRINKLER & MISTING SYSTEMS

STEP 1 VISUALIZE THE GREENHOUSE

Evaluate the location of obstacles such as curtains or hanging baskets. Consider aisles and whether they can be wetted. Review cultural practices which might impact the height at which the sprinklers should be placed.

STEP 2 SELECT A SPRINKLER HEAD FOR WATERING APPLICATIONS

GO TO STEP 3 (PAGE 4) FOR MISTING, PROPAGATION OR COOLING APPLICATIONS

All sprinkler solutions are based on an average sprinkler working pressure of 200 kPa and spacing between the sprinklers of 0.9m.



SINGLE BENCH with VibroNet sprinklers

BENCH WIDTH	SPACING BETWEEN SPRINKLERS	HEIGHT ABOVE CROP	
		0.6 - 0.9M	0.90 - 1.5M
M	M		
1.2	0.9	VN-BL or VN-GN	VN-BL or VN-GN
1.5	0.9	VN-BL or VN-GN	VN-BL or VN-GN
1.8	0.9	VN-BL or VN-GN	VN-BL or VN-GN



ONE LINE For single bay or tunnel with SpinNet sprinklers

BAY WIDTH	SPACING BETWEEN SPRINKLERS	HEIGHT ABOVE CROP		
		0.6 - 0.9M	1.2 - 1.5M	1.8 - 2.1M
M	M			
3.0	0.9	R-R-BL	-	-
3.6	0.9	R-R-BL	R-R-BL	-
4.2	0.9	BR-BR-BL	BR-BR-BL	R-R-BL
4.6	0.9	R-R-GY	BR-BR-BL	R-R-BL
4.9	0.9	R-R-GY	BR-Y-GY	R-R-BL
5.5	0.9	R-R-GN	BR-Y-GY	BR-Y-GY
6.1	0.9	-	R-R-GN	BR-BR-GN
6.7	0.9	-	R-R-GN	BR-BR-GN
7.3	0.9	-	-	BR-BR-GN

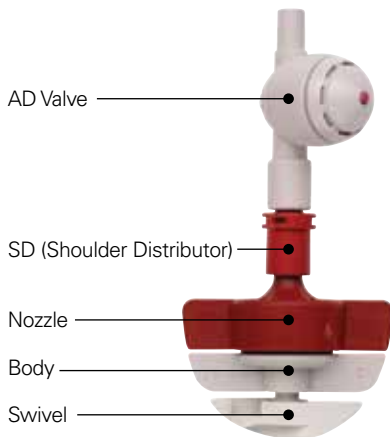


TWO LINES

For single bay or tunnel with SpinNet sprinklers

BAY WIDTH	SPACING BETWEEN SPRINKLERS	SPACE BETWEEN SPRINKLER LINES	HEIGHT ABOVE CROP		
			0.6 - 0.9M	1.2 - 1.5M	1.8 - 2.1M
M	M	M			
6.1	0.9	3.3	R-R-BL	-	-
6.7	0.9	3.6	R-R-BL	R-R-BL	-
7.3	0.9	3.6	R-R-BL	R-R-BL	R-R-BL
7.9	0.9	4.2	BR-BR-BL	R-R-BL	R-R-BL
8.5	0.9	4.6	BR-BR-BL	R-R-BL	R-R-BL
9.1	0.9	4.9	R-R-GY	R-R-GY	BR-BR-BL
9.7	0.9	5.2	R-R-GN	R-R-GY	BR-BR-BL
10.3	0.9	5.5	R-R-GN	R-R-GY	BR-BR-BL
11.0	0.9	5.8	R-R-GN	R-R-GY	R-R-GN
11.6	0.9	6.1	BR-BR-GN	R-R-GN	R-R-GN

SPINNET SPRINKLER



ORDERING GUIDE

QUICK CODE	TYPE	DESCRIPTION	FLOW RATE
			L/HR
VN-BL	VibroNet	Blue Nozzle	40
VN-GN	VibroNet	Green Nozzle	50
R-R-BL	SpinNet	Red SD, Red Nozzle, Blue Low Trajectory swivel	70
BR-BR-BL	SpinNet	Brown SD, Brown Nozzle, Blue Low Trajectory swivel	90
R-R-GY	SpinNet	Red SD, Red Nozzle, Grey Flat Trajectory swivel	70
BR-Y-GY	SpinNet	Brown SD, Yellow Nozzle, Grey Flat Trajectory swivel	90
R-R-GN	SpinNet	Red SD, Red Nozzle, Green High Trajectory swivel	70
BR-BR-GN	SpinNet	Brown SD, Brown Nozzle, Green High Trajectory swivel	90

All of the above require a 63000-003000 = AD Valve (Purple pin) 2 Bar opening pressure



WHICH ONE TO ORDER

CODE	SD	AD VALVE	SPRINKLER HEAD
VN-BL	-	63000-003000	64300-001000
VN-GN	-	63000-003000	64300-005000
R-R-BL	63000-014300	63000-003000	64200-026000
BR-BR-BL	63000-014350	63000-003000	64200-027000
R-R-GY	63000-014300	63000-003000	64200-007000
BR-Y-GY	63000-014350	63000-003000	64200-008000
R-R-GN	63000-014300	63000-003000	64200-017500
BR-BR-GN	63000-014350	63000-003000	64200-020000



DESIGN GUIDE FOR SPRINKLER & MISTING SYSTEMS

STEP 3

SELECT A SPRINKLER HEAD FOR MISTING, PROPAGATING & COOLING APPLICATIONS



VIBRONET SPRINKLER

FOR MISTING LARGER AREAS

The VibroNet sprinkler with blue nozzle is used when a light mist is required for watering, for example when germinating seeds. Excellent uniformity can be achieved with sprinkler spacings between 0.9m - 1.5m, with an elevation of 0.6m to 1.5m. The VibroNet sprinkler can be used upright or upside down.

PART NUMBER	DESCRIPTION	FLOW RATE L/HR
64300-001000	VibroNet Sprinkler with Blue Nozzle	40
64300-005000	VibroNet Sprinkler with Green Nozzle	50



COOLNET PRO SUPERFINE MISTER

FOR PROPAGATION & HUMIDITY CONTROL

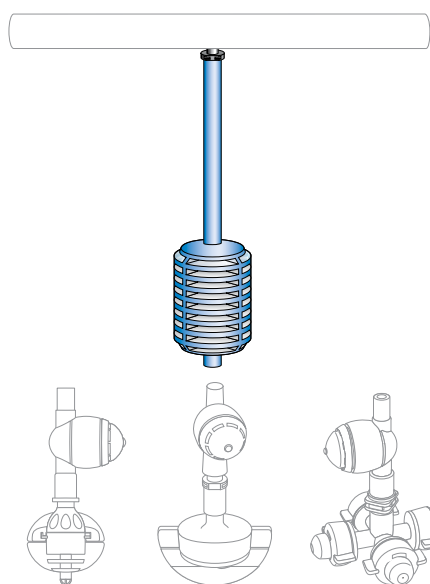
The CoolNet Pro superfine mister is the best nozzle for propagation. It creates a zone of saturated humidity that is ideal for rooting. Average droplet size is 65 micron at 4 Bar. refer to pages 8 - 9 for recommendations on how to use this product for propagation (humidifying) and cooling.

PART NUMBER	DESCRIPTION	FLOW RATE L/HR
63100-058300	CoolNet Pro Sprinkler x4 Grey Nozzles	30 (4 x 7.5L/Hr)



STEP 4 SELECT A SPRINKLER BASE

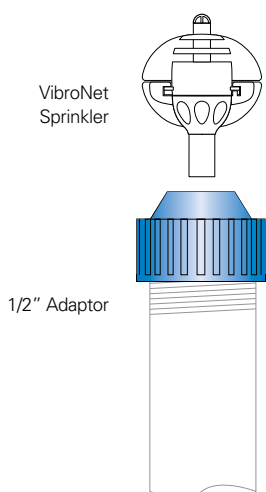
Netafim offers a selection of three bases to connect the sprinkler, mister or superfine mister to the supply pipe.



HANGING SPRINKLER ASSEMBLY

Used for connection to Polyethylene (PE) Tubing with Netafim sprinklers, misters and superfine misters.

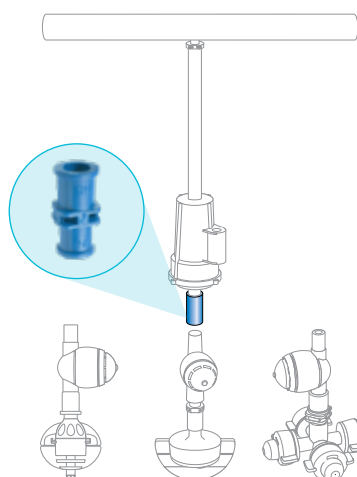
PART NUMBER	DESCRIPTION
63000-003570	15cm Dropper assembly with Stabiliser
63000-004060	30cm Dropper assembly with Stabiliser
63000-004450	46cm Dropper assembly with Stabiliser
63000-005860	60cm Dropper assembly with Stabiliser
63000-007160	90cm Dropper assembly with Stabiliser
63000-008350	120cm Dropper assembly with Stabiliser



1/2" ADAPTER

Used for connection to rigid pipe with 1/2" threaded connections and Netafim sprinklers.

PART NUMBER	DESCRIPTION
63000-001200	1/2" BSPF to F Press fit



RETROFIT ADAPTER

Used to connect Netafim sprinklers and superfine misters to other manufacturer's fittings.

PART NUMBER	DESCRIPTION
63000-002510	Retrofit adaptor suitable for Mini sprinklers



DESIGN GUIDE FOR SPRINKLER & MISTING SYSTEMS

STEP 5 SIZE THE SPRINKLER SUPPLY PIPE



Netafim UV White PE tubing offers a cool look, cooler water temperature and enhanced plant growth.

Use the chart below to select the correct sprinkler supply size. Low density polyethylene is strongly recommended.

POLY PIPE SIZING (mm)

SPRINKLER	NOZZLE COLOUR	FLOW RATE L/PH	LENGTH OF SPRINKLER SUPPLY PIPE					
			7.5M	15M	22M	30M	38M	45M
CoolNet Pro	Grey	30	19mm	19mm	19mm	19mm	19mm	19mm
VibroNet	Blue	40	19mm	19mm	19mm	19mm	19mm	19mm
VibroNet	Green	50	19mm	19mm	19mm	19mm	25mm	25mm
SpinNet Nozzle/SD	Red/Red	70	19mm	19mm	19mm	25mm	25mm	25mm
SpinNet Nozzle/SD	Brown/Brown	90	19mm	19mm	19mm	25mm	25mm	32mm
SpinNet Nozzle/SD	Yellow/Brown	90	19mm	19mm	19mm	25mm	25mm	32mm

STEP 6 SIZE THE DISTRIBUTOR AND MAINLINE

The remaining piping and system components are sized based upon the maximum flow they will receive. Use the Flow Per Sprinkler Line chart to determine the flow of a single sprinkler supply pipe for the length of run in your design. If more than one sprinkler line will be operated at once, be sure to multiply the flow by the number of lines when sizing the system pipes and components.

Pipe size recommendations are guidelines only. For distributor lines over 12m, mainlines over 30m or when slopes are a factor, please consult a design professional.

DISTRIBUTOR AND MAINLINE PIPE SIZING

PIPE SIZE		MAXIMUM*
INCHES	MM	L/PH
1/2"	15	1,350
3/4"	20	2,200
1"	25	3,800
1 1/4"	32	6,000
1 1/2"	40	8,000
2"	50	12,000

*Assumes PVC Class 12 and 1.5 m per second water velocity

FLOW PER SPRINKLER LINE (LPH)

SPRINKLER	NOZZLE COLOUR	AVERAGE FLOW LPH	LENGTH OF SPRINKLER SUPPLY PIPE #1 (NUMBER OF SPRINKLERS #2)					
			7.5M (9)	15M (17)	22M (25)	30M (34)	38M (42)	45M (50)
CoolNet Pro	Grey	30	270	510	750	1,020	1,260	1,500
VibroNet	Blue	40	360	680	1,000	1,360	1,680	2,000
VibroNet	Green	50	450	850	1,250	1,700	2,100	2,500
SpinNet Nozzle/SD	Red/Red	70	630	1,190	1,750	2,380	2,940	3,500
SpinNet Nozzle/SD	Brown/Brown	90	810	1,530	2,250	3,060	3,780	4,500
SpinNet Nozzle/SD	Yellow/Brown	90	810	1,530	2,250	3,060	3,780	4,500

#1 – Based on Poly Pipe Sizing (mm) Chart Above.

#2 - Sprinklers spaced at 0.9m



STEP 7 SIZE THE HEAD CONTROL COMPONENTS

The components should be sized according to the flow range shown in the Filter, Valve & Pressure Regulator sizing chart (see below). The pipe connecting to the components can be of a different size.

FILTER & VALVE SIZING

FILTER & VALVE	MAXIMUM FLOW	UNIT SIZE	CODE
	L/PH		
Electric Valve AC	5,500	3/4" (20mm) Globe	71640-007320
Electric Valve AC	10,000	1" (25mm) Globe	71640-007390
Electric Valve AC	24,000	1 1/2" (40mm) Globe	71640-007530
Electric Valve AC	40,000	2" (50mm) Globe	71640-001650
Disc Filter	2,500	3/4" (20mm)	70640-001200
Disc Filter	4,500	1" (25mm)	70640-002090
Disc Filter	9,000	1 1/2" (40mm) Super	70640-003400
Disc Filter	20,000	2" (50mm) Leader	70640-005340
Disc Filter	20,000	2" (50mm) Dual	70640-004700

Disc filter is 120 Mesh/130 Micron

PRESSURE REGULATOR SIZING

PRESSURE REGULATOR	FLOW RANGE	UNIT SIZE	CODE
	LPH		
Pressure Regulator 25m spring	800 - 4,500	Planet 3/4" (20mm)	30500-001600
	1,600 - 9,000	Planet 1 1/2" (40mm)	30520-001600
	3,200 - 18,000	Planet 2" (50mm) 4 Port	30540-001600



CONTROL HEAD ASSEMBLY ORDER:

1. VALVE
2. FILTER
3. PRESSURE REGULATOR

*Size of components vary based on flow rate.



Valve



Filter



Pressure Regulator

STEP 8 STARTING UP A SYSTEM FOR THE FIRST TIME

The most important point to remember when starting up a new system is to flush the mainlines. Debris from construction can otherwise be washed into the sprinklers, causing a plug or improper operation. To properly flush a system, first connect all the pipes and assemblies, except the sprinklers with Check Valves. Next, open the ends of the distributor line and the sprinkler supply pipes. Close them off, one by one, starting with the opening closest to the head control, and proceeding to the most distant opening. Only after complete flushing should the sprinklers with Check Valves be attached to the assemblies.



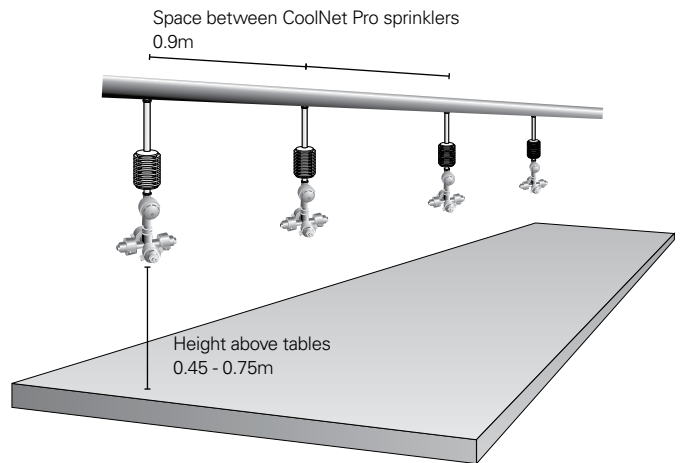
COOLNET PRO SUPER FINE MISTER INSTALLATIONS
PROPAGATION BENCHES INFORMATION

0.9M TO 1.2M BENCH

The height of the superfine mister assembly should be 0.45m to 0.75m above the propagation material. The distance between the superfine mister assemblies should be 0.9m. (Place the lateral above the centre of a 0.9m to 1.2m bench.)

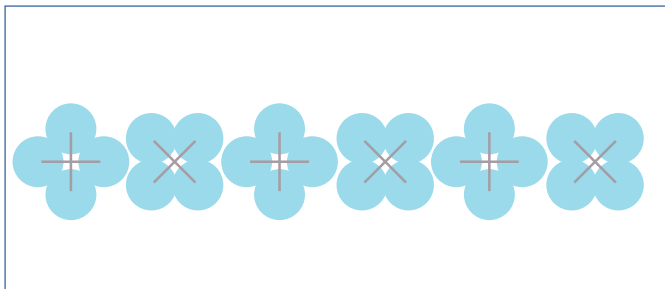
WIDE BENCH

For wide benches (up to 2.4m) use two lines of superfine misters equally distanced from the center of the bench. For large areas, use one row of superfine misters for every 1.2m width of area to be misted.

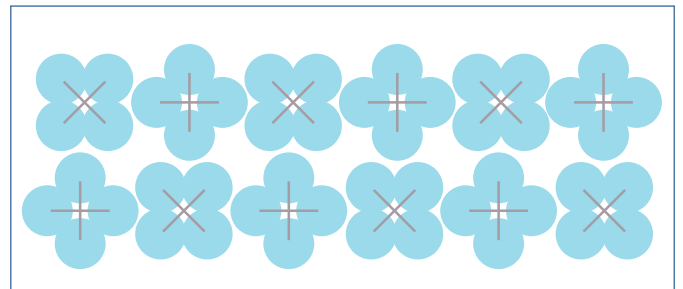


45° OFFSET

4-way crosses should be placed at 45° angles to one another.



Above head view of single row of CoolNet Pro Sprinklers.



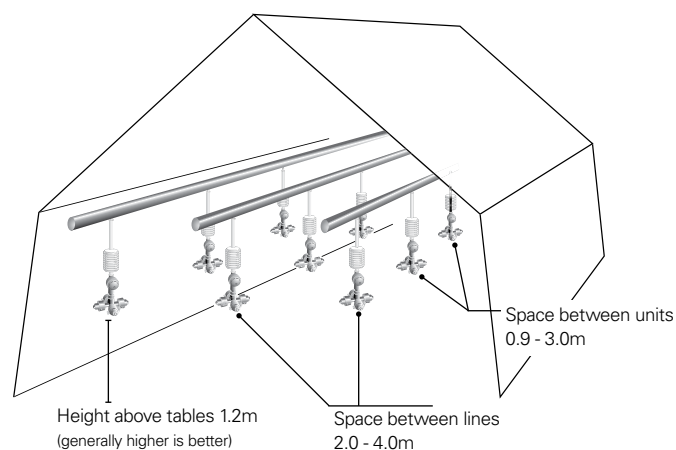
Above head view of dual rows of CoolNet Pro Sprinklers.



COOLNET PRO SUPER FINE MISTER INSTALLATIONS HUMIDIFICATION AND COOLING INFORMATION

COOLING CONSIDERATIONS INCLUDE:

- Place the CoolNet Pro sprinkler as high as possible
- Avoid spraying against the roof or structure
- Prevent precipitation by adjusting the cycle time



GENERAL SPACING AND OPERATION FOR HUMIDIFYING AND COOLING

Distance Between CoolNet units (m)	0.9	1.5	2.0	3.0	2.0	3.0
Distance Between Laterals (m)	2.0	3.2	3.0	3.0	4.0	4.0
CoolNet 4 x 7.5 L/Ph – Pulse time (sec)	1	3	5	10	20	30
CoolNet 4 x 7.5 L/Ph – Interval time (sec)	74	91	120	150	355	345

GENERAL SPACING AND OPERATION CONSIDERATIONS INCLUDE:

- In order to maximize the cooling effect, exhaust fans are recommended to exchange the air about 20 times per hour.
- These recommendations are general and should be applied in accordance with local conditions and limitations.
- Duration of pulse and interval is to be fine-tuned according to local conditions; the timing provided is just a starting point.
- For crops that are not sensitive to wetting, the pulse can be prolonged, and/or the interval shortened.
- Other spacing can certainly be used with CoolNet Pro; the spacings above give some reference points between spacing and operation intervals.

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