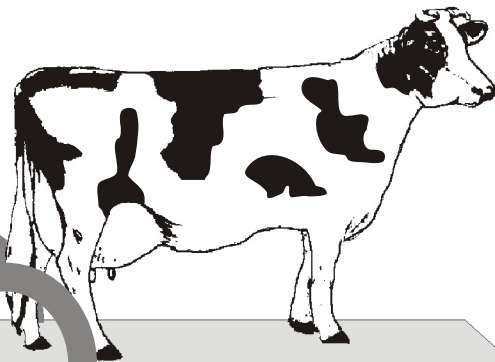
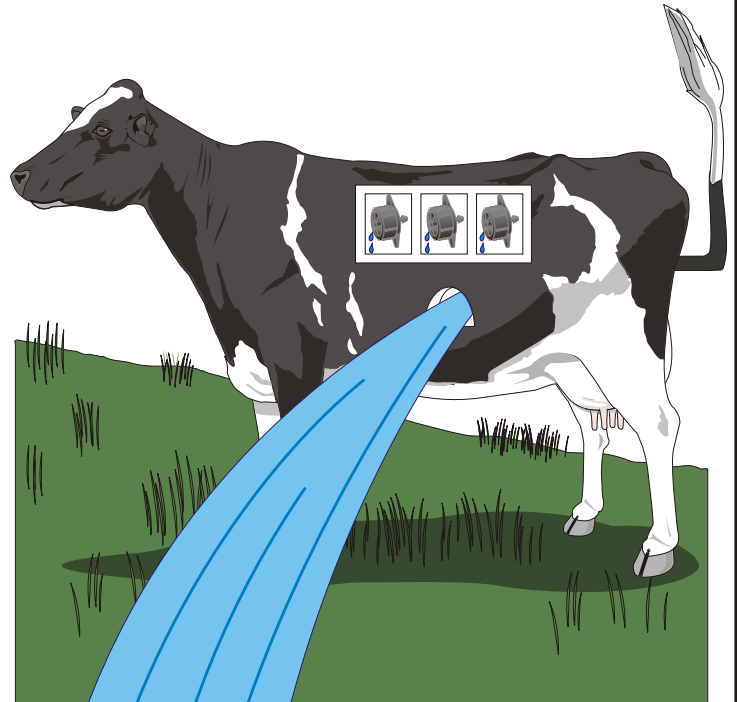




# Haven't you herd?

Don't take a chance with  
your cows' health . . .



- ☐ Save Money with Drip, Spray, and Fog Cooling!
- ☐ Increase Rate of Gain per Pound of Feed!
- ☐ Reduce Respiration Rate and Heat Stress!
- ☐ Increase Birth Weights and Lactation!

\* See inside for details



8827 Garden Lane \* Greendale, WI 53129

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**GREENHILL**  
Manufacturing, Ltd.

# SPRAY COOLING EFFECTS

## Florida Study

Cow Effect	No Cooling	Spray
Respiration Rate	96	57
Feed Consumption	39.2	42.0
Milk Production	39.8	44.4

## Kentucky Study

Cow Effect	No Cooling	Spray
Respiration Rate	91	75
Feed Consumption	77.0	84.1
Milk Production	50.1	58.0

Source: ASAE, October 1990

Hot summer weather can be rough on cows. If temperatures over 80°F persist for long periods of time, death can occur. At the very least, temperatures over 75°F will decrease the feed efficiency and weight gain of cows. Milking cows are of particular concern in such heat because heat stress can reduce their milk production, lower birth weight, and reduce the growth of young cows. Extreme heat stress can cause reproduction problems, and even death.

To deal with these problems, Greenhill Manufacturing has developed an economical intermittent electronic controller, with drip, spray, and fog/mist cooling systems.

The electronic controller and solenoid valve assemblies are all made of heavy-duty plastic and stainless steel. The controller itself makes use of ultra-low power consumption electronic components, (less than two watts without solenoid activities) and is housed in a water-tight, heavy-duty plastic case.

The controller is factory set to activate at 78°F, and will turn cooling water on for one minute, and off for ten minutes. The DG2100 model has an additional temperature stage; if the temperature goes above 88°F, the controller will turn water on for two minutes and off for ten. These settings will very likely never need to be changed, but the user can easily adjust them if he or she so chooses.

## Drip Cooling

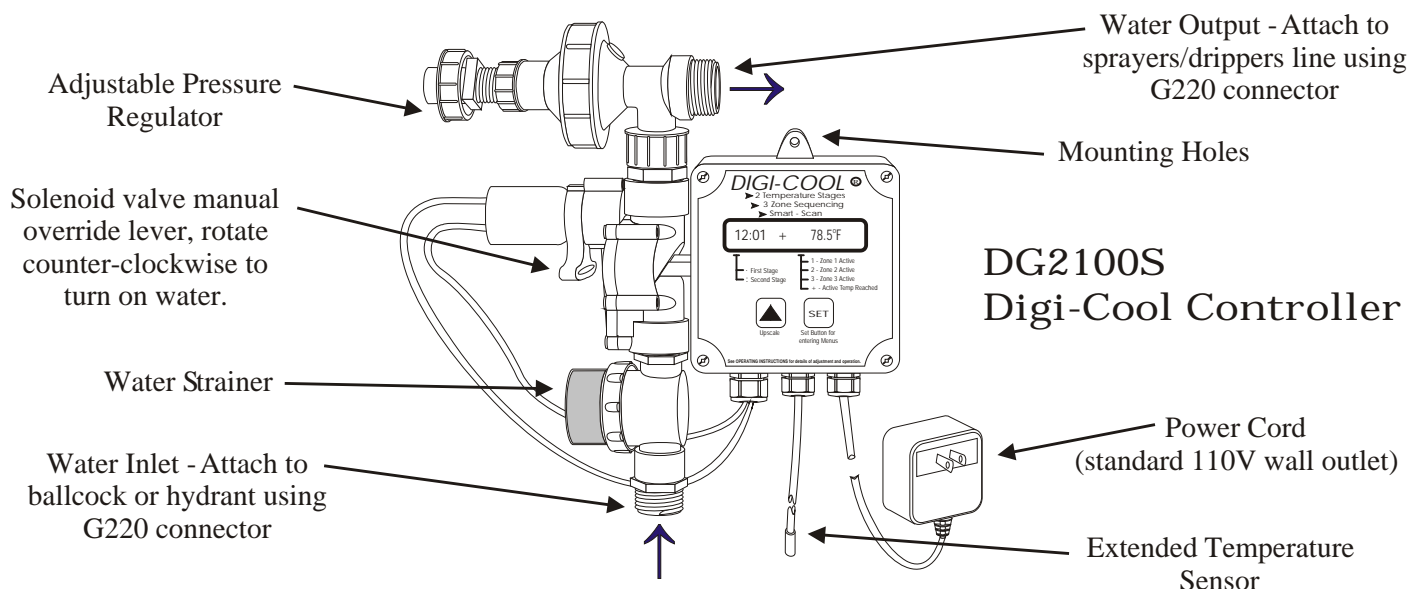
Drip cooling is achieved by placing a dripper above the cow's neck and shoulders. Mounting details are given in the next few pages. The drip nozzles drip at the rate of one gallon per hour (GPH) at 15 PSI, or about two ounces every ten minutes. If additional water is needed, it can be obtained in several ways; the first by increasing On Time, (instructions are on following pages) and the second by increasing system pressure using pressure regulators (G250, Adjustable Pressure Regulator). If less water is desired, it can be obtained by decreasing system On Time or pressure. Individual drippers can be adjusted or shut off using the close-offs (G138) illustrated in the following pages.

## Spray Cooling

Spray cooling is achieved by running overhead lines above the area to be sprayed. Greenhill furnishes two types of nozzles, a standard 180° fixed spray nozzle (G140) and a rotary spray nozzle (G150).

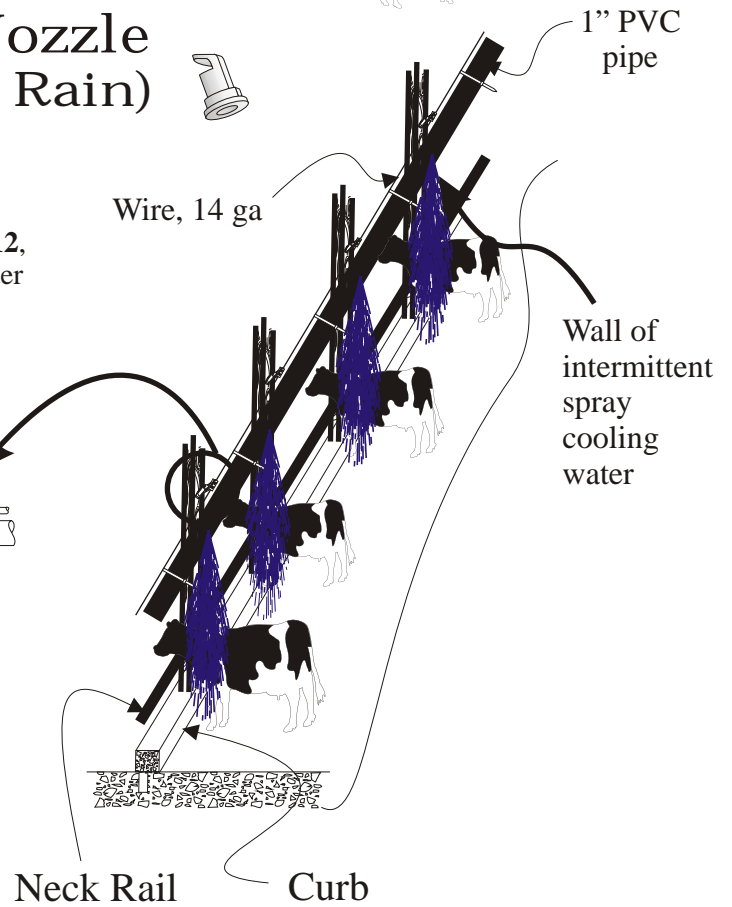
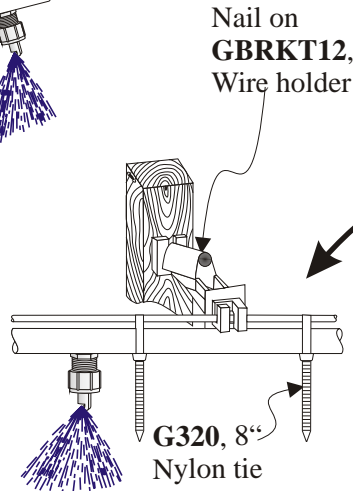
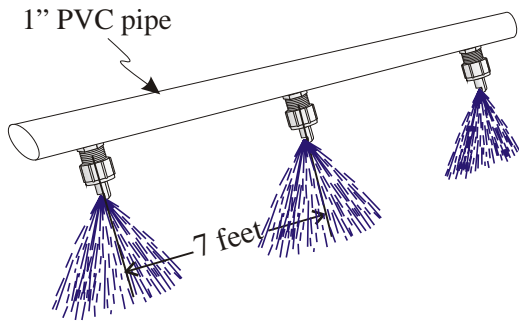
The standard fixed spray nozzle (G140) sprays 12 GPH or 2/10 gallons per ten minutes over a half circle area with a three foot radius as shown in the following pages.

The rotary spray nozzle (G150) uses 9 GPH and throws it over a circle eight feet in diameter. If more or less water is desired, it can be obtained by increasing or decreasing pressure or changing watering times as outlined above.

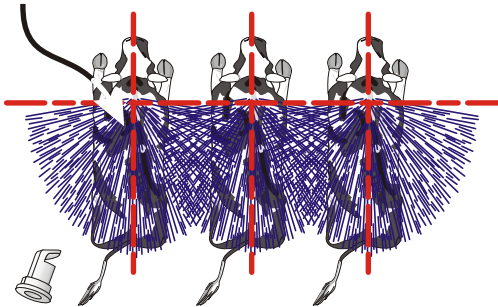




# Typical Freestall Barn Spray Nozzle (Soaking Rain)



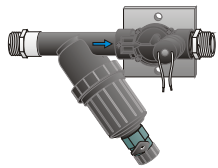
Cows' vital organ area.  
Cooling water obtains  
maximum effect when  
aimed at this vital organ area!



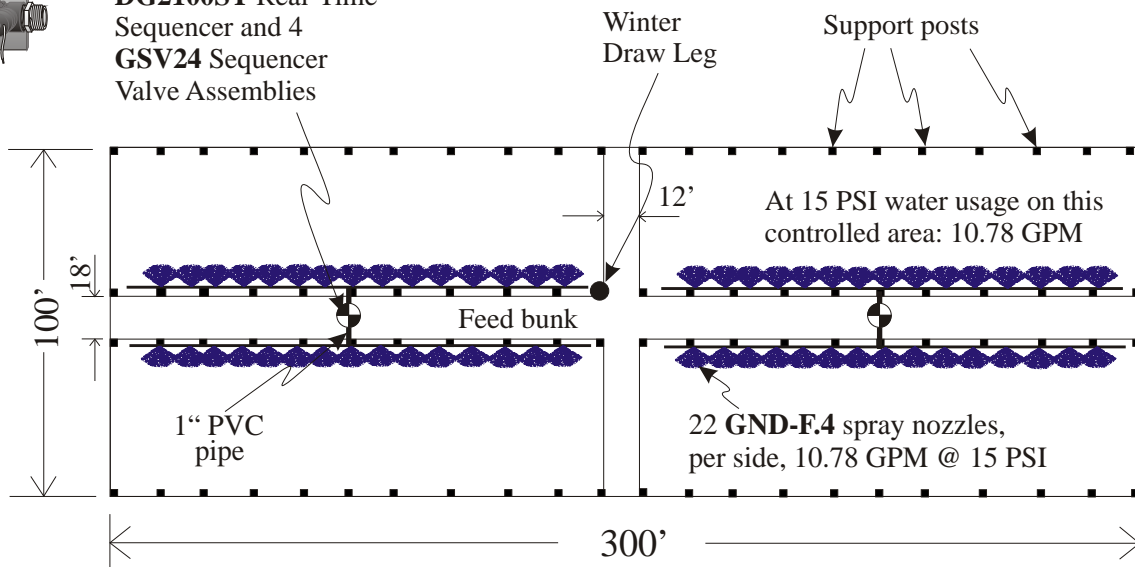
Aim **GND-F.4** nozzle to spray  
water over the shoulders and  
toward the rear of the cow!!

## Flat Spray Nozzle

Sprayer	Spray angle at 20 PSI	10 PSI	15 PSI	20 PSI	Color
<b>GND-F.25</b>	110°	0.25 GPM	0.31 GPM	0.35 GPM	Brown
<b>GND-F.3</b>	110°	0.3 GPM	0.37 GPM	0.42 GPM	Gray
<b>GND-F.4</b>	120°	0.4 GPM	0.49 GPM	0.57 GPM	White
<b>GND-F.5</b>	125°	0.5 GPM	0.61 GPM	0.71 GPM	Light blue
<b>GND-F.75</b>	145°	0.75 GPM	0.92 GPM	1.06 GPM	Lime green



**DG2100ST** Real-Time  
Sequencer and 4  
**GSV24** Sequencer  
Valve Assemblies



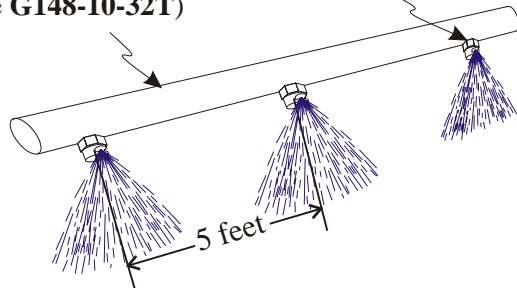


# Typical Freestall Barn Spray Nozzle (Rain)

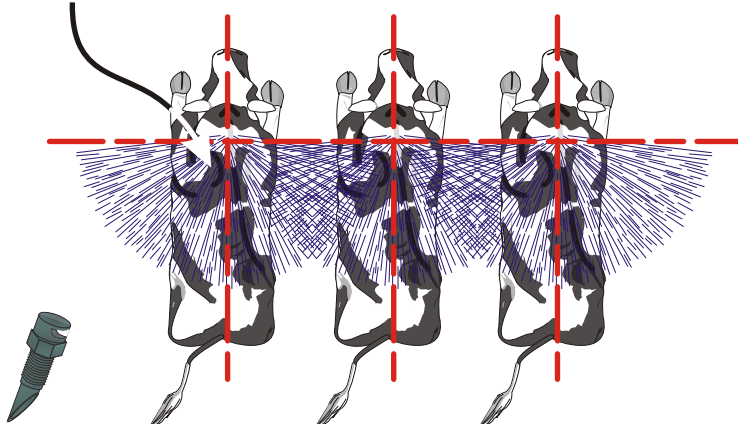


Greenhill's  
**G110** Polytube,  
or 3/4" PVC  
drilled and tapped  
(Use **G148-10-32T**)

**G143**, 180° spray nozzle,  
17 GPH @ 15 PSI,  
5 ft. center to center



Cows' vital organ area.  
Cooling water obtains maximum effect  
when aimed at this vital organ area!



Aim **G143** nozzle to spray  
water over the shoulders and  
toward the rear of the cow!!

Wire, 14 ga

Wall of  
intermittent  
spray cooling  
water

**G110**, 1/2"  
Polytube

Neck Rail

Curb

Nail on  
**GBRKT12**,  
Wire holder

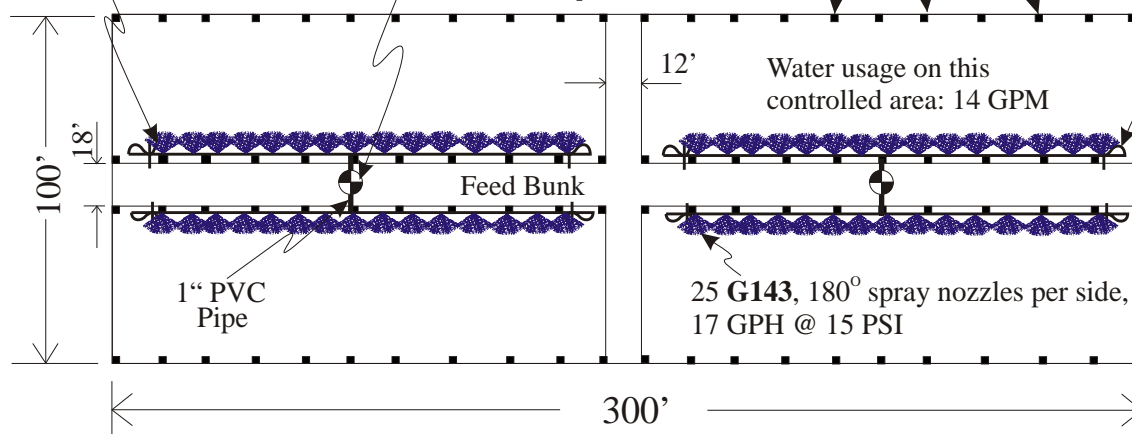
**G320**, 8"  
Nylon tie

**G160**, 1/2"  
Close-Off

**DG2100S**  
Digi-Cool®  
Control

Support Posts

**G110**, 1/2"  
Polytube



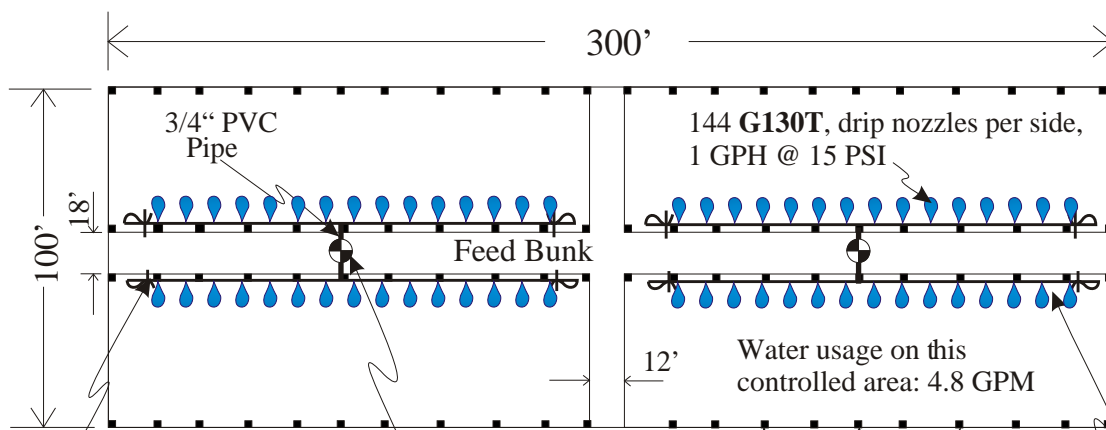




# Typical Freestall Barn

## Drip Nozzle

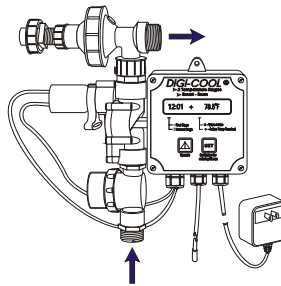
### (Heavy Rain)



G160, 1/2" Close-Off



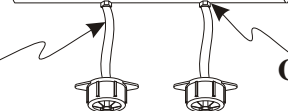
DG2100S Digi-Cool® Control



G110, 1/2" Polytube

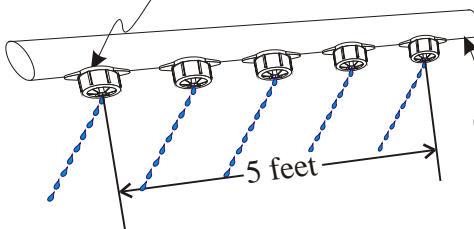
3/4" PVC (Use G148-10-32T)

G120, 1/4" flexible tubing



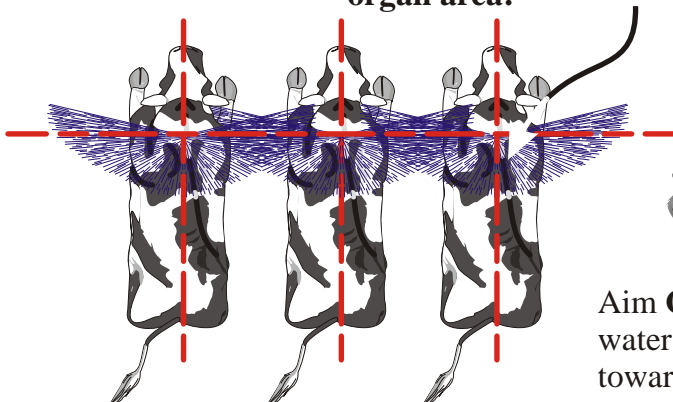
G215, 1/4" barb x 10-32 MT adapter

G130T, drip nozzles, 1 GPH @ 15 PSI, 1 ft. center to center



G110, 1/2" Polytube

Cows' vital organ area. Cooling water obtains maximum effect when aimed at this vital organ area!



Aim G130T nozzle to drip water over the shoulders and toward the rear of the cow!!

Wall of intermittent drip cooling water

Wire, 14 ga

G110, 1/2" Polytube

Neck Rail

Curb

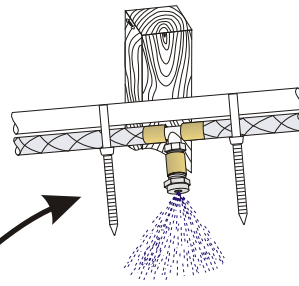
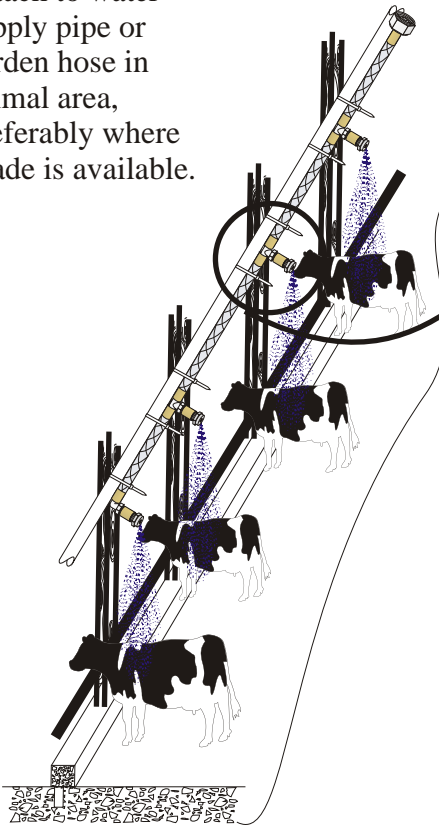
Nail on GBRKT12, Wire holder

G320, 8" Nylon tie

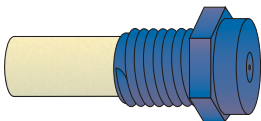
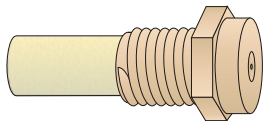
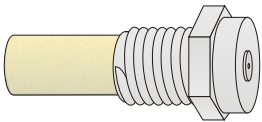
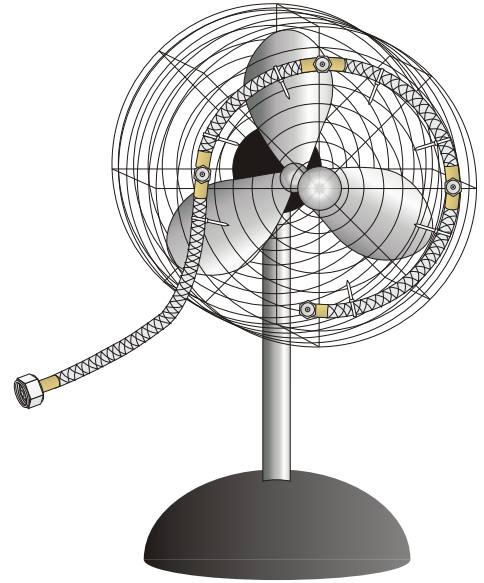
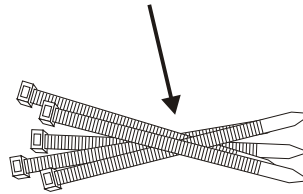
# Fog Cooling System

Complete fog nozzle line with swaged ferrules and standard 1/2" FPT swivel

Attach to water supply pipe or garden hose in animal area, preferably where shade is available.



Use **G320** nylon ties to fasten **GFA-412P** to pipe or 2 x 4, preferably in shaded animal area.



**GNC1214**, barbed swivel adapter (ball seal), 1/2" FPT x 1/4" barb, or contact factory for other choices

**G546-18**, brass coupling, 1/8" x 1/8" FPT

16" center-to-center distance

Swaged ferrule fittings

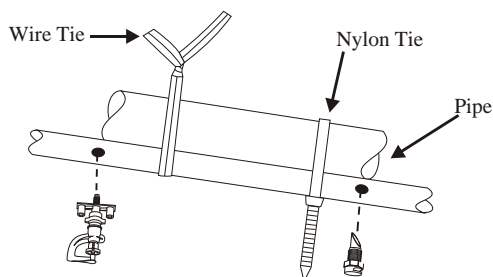
**GPT250**, 1/4" ID reinforced clear tubing

Model **GFA-412P** shown

Part Number	Nozzles	Fan Diameter	Length
GFA-412P	4	24"	72"
GFA-612P	6	30"	104"
GFA-812P	8	36"	136"
GFA-1012P	10	48"	168"

Please consult factory for other lengths.

Kit includes three times as many **G320** nylon ties as nozzles. Example: **GFA-412P** comes with 12 **G320**.

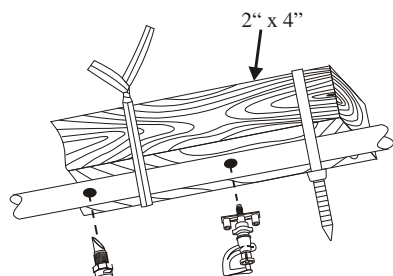


G130T

## Dripper Chart

Dripper	10 PSI	15 PSI *	20 PSI	Disk Color
G130T	0.88 GPH	1.08 GPH	1.25 GPH	Black
G135T	0.43 GPH	0.53 GPH	0.61 GPH	Orange

\* - 15 PSI is the recommended operating pressure for the G130T and G135T.



G150



G151



G140

Attach 5/8" O.D. tube to underside of pipe, 2 x 4 truss, purlin, etc., using whichever works best: loop clamp and screw, wire tie, or nylon tie. Two types of spray nozzles are provided to accommodate the many different cow raising facilities. The G140 spray nozzles cover a 3 foot radius, and are best placed at 3 foot centers, as shown on the left. The G150 rotary spray nozzle puts out a cone of water with an 8 foot base, and would be used one or two per pen, as shown on the left. For good results, it is best to balance the runs, as shown on the left.

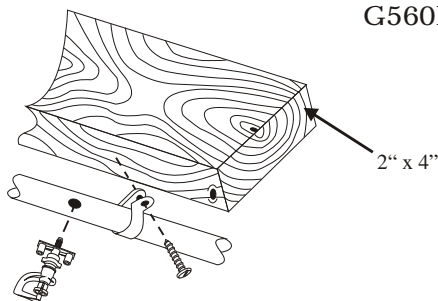
## Sprayer Chart (Low Pressure)

Sprayer	10 PSI	15 PSI	20 PSI	Cone	Color
G150	7.5 GPH	9.0 GPH	9.8 GPH	360° Full circle	Black rotor
	7.0' dia.	8.0' dia.	9.0' dia.		
G151	17.5 GPH	19.5 GPH	22.5 GPH	180° Half circle	Orange rotor
	17' dia.	21' dia.	25' dia.		
G140	9.5 GPH	12 GPH	14 GPH	180° Half circle	Black
G143	14 GPH	17 GPH	20 GPH		Green
G145	4.9 GPH	6.0 GPH	7.5 GPH		Brown

(G140, G143, and G145 have a 3' fixed radius.)



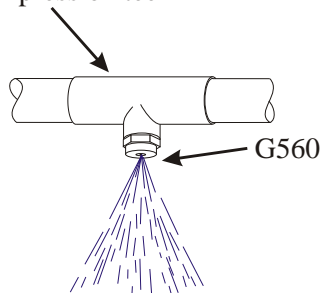
G560FL



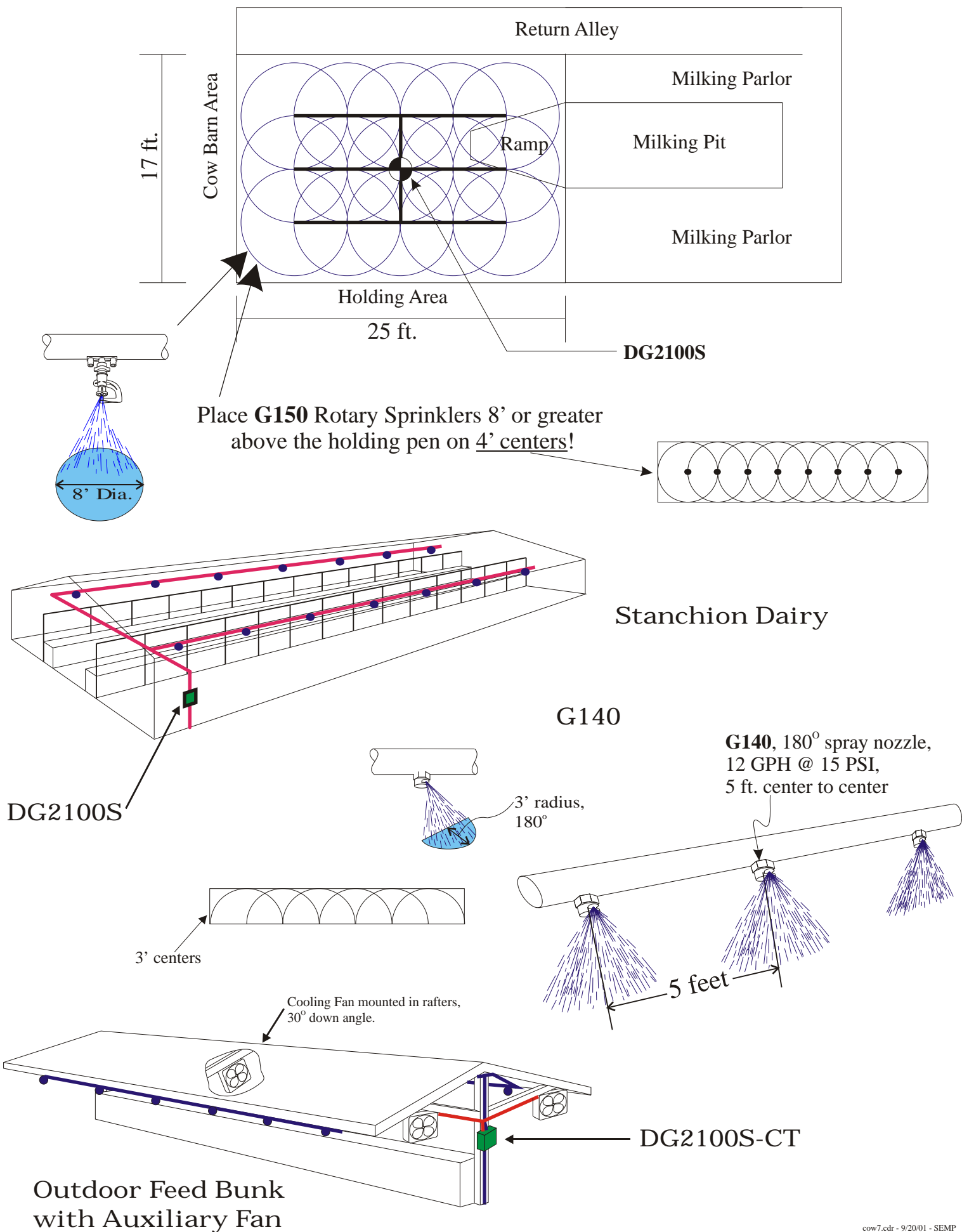
## Fogger Chart (High Pressure)

Fogger	40 PSI	60 PSI	75 PSI	150 PSI	Color
G560FL	0.7 GPH	1.0 GPH	1.2 GPH	1.5 GPH	Grey
G565FL	1.2 GPH	1.5 GPH	1.6 GPH	2.2 GPH	Cream
G567FL	1.6 GPH	1.9 GPH	2.1 GPH	3.1 GPH	Blue

G550 PVC slip tee or G570 compression tee



# Typical Holding Area



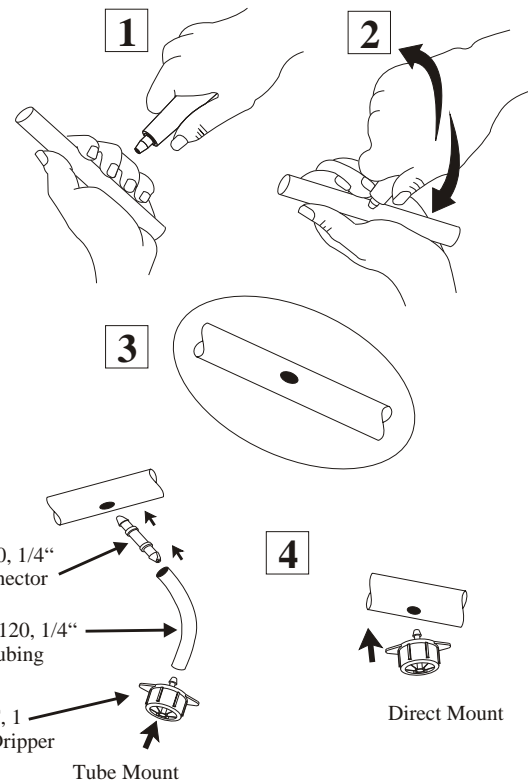


## Hole Punch

Place hole punch (G280) perpendicular to 1/2" hose as shown in Figure 1. Using a twisting motion, (Figure 2) cut out a disk from the hose. Figure 3 shows how it should look after the hole has been punched. After all holes are punched and drippers, sprayers, connectors, and tees are attached, flush out the system so that any foreign material that may have entered the lines will be removed and will not clog the drippers or sprayers.

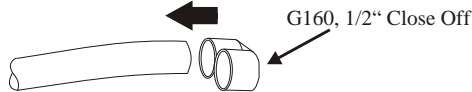
### Important!

1. Use only the hole punch supplied to make holes. Use of other objects to make holes may create an uneven, ragged hole which will not seal around barbs, resulting in leakage.
2. Replace hole punch when it becomes dull. Attempts to re-sharpen an old punch will change the size of the hole it cuts, and may cause leakage.

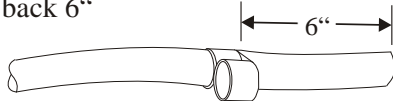


## Closing Off Hose Ends

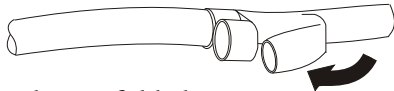
Slide hose and clamps over hose end



Slide clamp back 6"



Now fold hose tightly back and kink hose

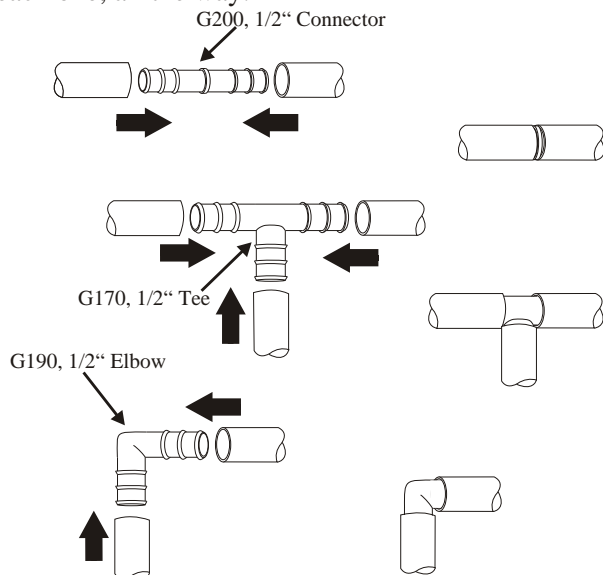


Slide clamp back over folded end



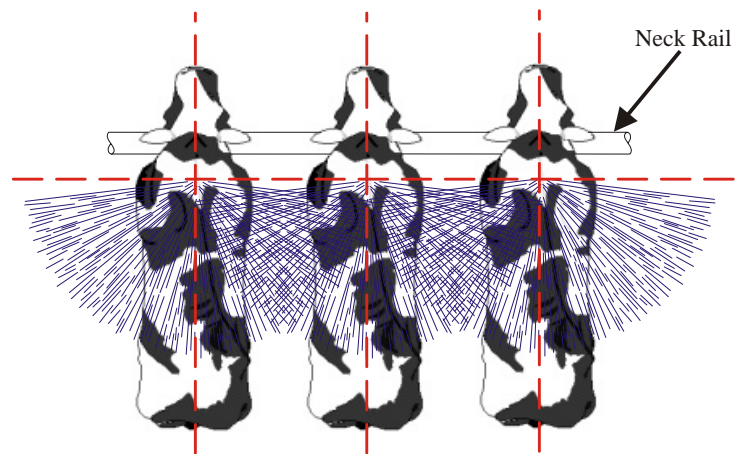
## Inserting Fittings (15PSI)

Cut hose or hoses to desired length, making sure that ends are clean and straight. Push ends over ridges as shown for each one, all the way.



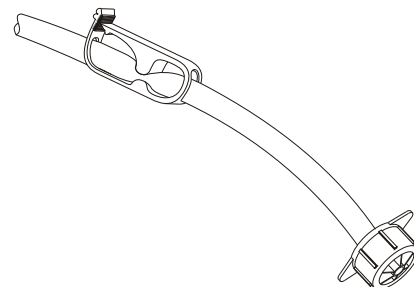
## Drip and Spray Nozzle Location

Locate the drip and/or spray nozzle over the cow's shoulder blades and neck area. Make sure it is behind the ears. Fence wire can be used to support the nozzle from either above or below. In any event, the nozzle must remain out of the cow's reach.



## Nozzle Adjustment and Shut-Off

To adjust/shut off nozzles when using the close-off option, slide the close-off (G138) onto the tubing and pinch as shown.





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