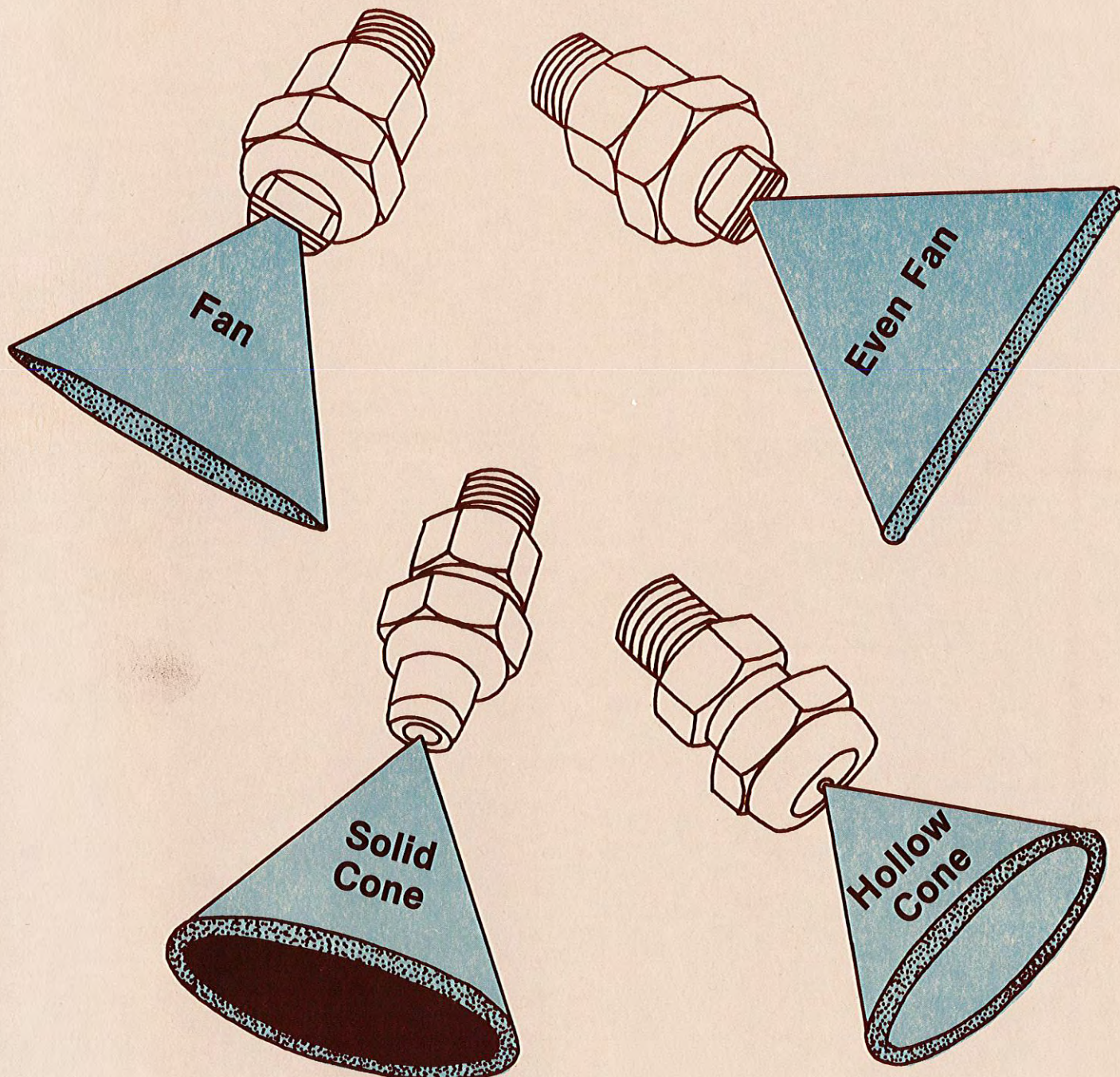


Sprayer Nozzle Tip Capacity Information



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Sprayer Nozzle Tip Capacity Information

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The flow capacity of a nozzle tip depends upon the size and shape of the opening in the tip and the pressure on the fluid being forced through the tip opening. The application rate per unit area (typically in gallons per acre) depends upon this flow capacity, the speed at which the tip is moved across the field and the width of the strip covered by the spray pattern produced by the tip. When all these variables are considered, it is obvious that a chart describing just one nozzle tip will about fill a page. Since there are several companies currently manufacturing nozzle tips and many of

these individual companies produce over 200 different tips, collecting and printing full information on all tips from all manufacturers would be almost unmanageable. To get this information reduced to a more manageable size, the more commonly used nozzle patterns and tip sizes have been selected.

As an additional aid to potential users of this information concerning nozzle tip sizes and patterns produced by the tips, a guide to nozzle tip selection is included. This guide will assist users in selection of appropriate tips for typical application needs and situations.

A Guide to Nozzle Tip Selection

Nozzle Pattern	Typical Nozzle Spacing	Typical Spraying Pressures	Most Common Application
Flat Fan	20 inches	30-60 PSI	Broadcast application of herbicides, insecticides, and fertilizers.
Even Fan	NA	20-40 PSI	Band application of herbicides, insecticides and fertilizers.
Flood	40 inches	10-25 PSI	Broadcast application of fertilizers and defoliants.
Solid Cone	40 inches	15-40 PSI	Soil incorporation of herbicides. Also used for insecticides with two or three nozzles per row to maximize plant coverage.
Hollow Cone	NA	40-60 PSI	Band application of herbicides, application of fungicides to plant foliage at higher pressures with smaller droplet size than solid cone nozzles.
Disc Cone	NA	40-400 PSI	High Pressure — high volume application of fungicides.

To further reduce the number and length of nozzle tip tables, only the capacity of each tip in volume per unit time and stated operating pressures is given. By using the following formulas, the information given in the nozzle tip tables can be adapted to a diverse variety of situations involving agricultural chemical application.

$$\text{GPA} = \frac{5940 \times \text{GPM}}{\text{MPH} \times \text{W}}$$

$$\text{GPM} = \frac{\text{GPA} \times \text{MPH} \times \text{W}}{5940}$$

$$\text{MPH} = \frac{5940 \times \text{GPM}}{\text{GPA} \times \text{W}}$$

$$\text{W} = \frac{5940 \times \text{GPM}}{\text{MPH} \times \text{GPA}}$$

GPA = Application rate in gallons per acre

GPM = Nozzle tip flow in gallons per minute

MPH = Travel speed in miles per hour

W = Nozzle spray pattern width in inches

PSI = Pressure in pounds per square inch

Recommendations for Efficient and Effective Use of Nozzle Spray Tips

1. Replace worn tips with new tips when application rate is 25 percent more than for new tips of the same size and pattern.
2. Use only a soft bristled brush or a toothpick to clean clogged tips. **NEVER USE METAL OBJECTS TO CLEAN TIPS!**
3. Hardened stainless steel tips may cost two or three times as much as brass. However, life of the tip is about 15 times that of brass!
4. Solvents, such as gas, oil, diesel, grease, etc., will soften plastic tips. Use care when handling tips to prevent damage from solvents.
5. Select nozzle tip size and pattern based on the application requirement.
6. Use nozzle tip strainers to minimize nozzle tip clogging. Use of tank and line filters will

also reduce clogging.

7. Mount nozzle tips at the recommended height to assure full pattern coverage (see page 23).
8. Some nozzles do not develop a full pattern at less than 30 PSI. Check manufacturer's recommendations for each tip.

NOTE: When using nozzle tip table to select appropriate tip sizes for a specific application rate, you will seldom have a calculated need that fits a given nozzle rate in the table exactly. In most cases, you should select the next largest tip size and adjust operating pressure and travel speed slightly to achieve the desired application rate. Selection of a smaller tip will usually result in higher operating pressures, which increases the number of fine particles in the spray. This in turn causes more spray drift, which is usually undesirable. If the calculated tip size needed is only slightly more than a table value, you may desire to select the smaller tip in these situations.

The following examples illustrate how to use the nozzle tip tables and the formulas given above in various application situations.

Example:

Consider a boom sprayer with a nozzle spacing of 20 inches. We need to apply a herbicide at 20 PSI and 30 gallons per acre. Effective sprayer speed in this situation is 6 MPH. What tip should we buy?

Using the formula:

$$\text{GPM} = \frac{\text{GPA} \times \text{MPH} \times \text{W}}{5940}$$

$$\text{GPM} = \frac{30 \times 6 \times 20}{5940} = 0.606$$

Looking in flat spray tables for a GPM of 0.606 at 20 PSI, we note that we could use a set of TeeJet Nozzle tips 6510 or 730924 or 8010 or Delavan tip LF-10.

Example:

Suppose a farmer has just bought a boom sprayer with a nozzle spacing of 20 inches; and it is equipped with TeeJet Nozzle tips 8004. Are these tips needed to apply a herbicide at 40 PSI and 50 gallons per acre at 7 MPH ground speed?

Again using the formula:

$$\text{GPM} = \frac{\text{GPA} \times \text{MPH} \times \text{W}}{5940}$$

We can determine the size tips needed under these circumstances:

$$\text{GPM} = \frac{50 \times 7 \times 20}{5940} = 1.17$$

Looking in the flat spray table, we will find that TeeJet tip 8004 delivers only 0.4 GPM at 40 PSI so this tip would not be large enough. The flat spray table shows us that we would need a TeeJet tip 8015 or a Delavan tip LF-15.

Example:

Can the above farmer get by with the 8004 nozzle tips that come with the sprayer by reducing ground speed enough to meet the volume requirement? To check this out, use the formula:

$$\text{MPH} = \frac{5940 \times \text{GPM}}{\text{GPA} \times \text{W}}$$

$$\text{MPH} = \frac{5940 \times 0.4}{50 \times 20} = 2.3$$

Depending on the amount to be sprayed, this slow speed might cost more in additional labor and fuel than a new set of tips. Could we accomplish the job by raising the operating pressure? The pressure volume table indicates the 8004 tip is designed to go only to 60 PSI and at this pressure it will deliver 0.49 GPM.

Using the formula:

$$\text{GPA} = \frac{5940 \times \text{GPM}}{\text{MPH} \times \text{W}}$$

it is noted that:

$$\text{GPA} = \frac{5940 \times 49}{7 \times 20} = 20.7$$

which is far below the 50 GPA required.

Example:

Suppose a farmer who has been pre-emerging in 14-inch bands wants to stretch chemicals by applying in 6-inch bands. With preemergence recommendations being 20 gallons per acre at 30 pounds pressure and 4 miles per hour speed, what tip should we purchase?

Using the formula:

$$\text{GPM} = \frac{\text{GPA} \times \text{MPH} \times \text{W}}{5940}$$

$$\text{GPM} = \frac{20 \times 4 \times 5}{5940} = 0.08$$

Looking in even fan tip tables at 30 PSI, we note that TeeJet 8001E or 9501E or Devalan LE-1 or Century 0-EF are in this GPM range.

Example:

Suppose a farmer has built a post-emergence rig by mounting nozzles on the cultivator gangs. With this weed problem, it is decided that two nozzles to the row applying in a 14-inch band 50 gallons per acre at 30 pounds pressure would do a good job. Crop and field conditions dictate a maximum ground speed of 3 miles per hour. What nozzle tips should we purchase? Again using the formula:

$$\text{GPM} = \frac{\text{GPA} \times \text{MPH} \times \text{W}}{5940}$$

$$\text{GPM} = \frac{40 \times 3 \times 14}{5940} = 0.282$$

Since there are two nozzles making this 14-inch band, each tip should be delivering

$$\frac{.282}{2} \text{ or } .141 \text{ GPM}$$

Looking in either the flat or even spray tables at 30 PSI, the following tips will do the job. TeeJet 6502 or 730231 or 8002 or 8002E or 9502E or Delavan LF-2 or LE-25 or Century 10-NSF or 10-F or 15-F or 2-EF.

Example:

A farmer has decided to mount a flooding type nozzle on cultivator gangs to apply a layby chemical protection covering the entire row middles. The rows are on a 38-inch width. Application recommendations are 50 gallons per acre at 20 PSI pressure. His field conditions dictate a 5 MPH speed. What nozzle tip should be used? Again using the formula:

$$\text{GPM} = \frac{\text{GPA} \times \text{MPH} \times \text{W}}{5940}$$

$$\text{GPM} = \frac{50 \times 5 \times 38}{5940} = 1.6$$

Looking in flooding tip tables at 20 PSI, the following tip will do the job. TeeJet TK-15.

Example:

A farmer has rigged a sprayer to treat plants in a row for insects or disease. Rows are spaced at 38-inches. The farmer needs five nozzles per row. The chemical application recommendation is 200 gallons per acre at 100 PSI. The farmer can effectively travel the sprayer at 6 MPH.

Using the formula:

$$\text{GPM} = \frac{\text{GPA} \times \text{MPH} \times \text{W}}{5940}$$

$$\text{GPM} = \frac{200 \times 6 \times 38}{5940} = 7.66$$

Since there are five nozzles furnishing this GPM, each nozzle would be furnishing $7.66 \div 5 = 1.53$ GPM. Checking the cone type nozzle tip tables at 100 PSI indicates the following tips will do the job: TeeJet D-6-46 or Delavan DC-6-46 or DC-10-45.

Example:

A farmer has built a trellis tomato sprayer that has 11 nozzles to each trellis. The trellises are 4 feet apart. We can safely operate the rig in this rolling field at about 3 miles per hour. The farmer has read some place that the need could arise to apply 400 gallons per acre at 400 pounds pressure. What nozzle tip should we purchase? Again using the formula:

$$\text{GPM} = \frac{\text{GPA} \times \text{MPH} \times \text{W}}{5940}$$

$$\text{GPM} = \frac{400 \times 3 \times 48}{5940} = 9.69$$

Since there are 11 tips spraying on the 48 inch width, each tip must deliver $9.69 \div 11 = 0.88$ GPM. Looking in the disc cone spray nozzle tip table, we note that TeeJet tip D-4-25 or Delavan tip DC-4-25 will do the job.

If you need more information on special tips, contact a manufacturer. Some manufacturers who sell tips in Tennessee are:

Century Engineering Corp.
221 Fourth Avenue SE
Cedar Rapids, Iowa 52401

Delavan-Delta, Inc.
20 Industrial Drive
Lexington, Tennessee 38351

Spraying Systems Company
North Avenue
Wheaton, Illinois 60188

The products and companies identified in this publication are mentioned for the sole purpose of providing specific information to appliers of agricultural chemicals. No product or company endorsement is intended.

Nozzle Band Widths Based on Nozzle Spray Angle and Distance to Target Surface

Width of Spray Pattern at Various Distances from Nozzle Orifice

Spray Angles	2"	4"	6"	8"	10"	12"	25"	18"	24"	30"	36"	42"	48"	60"
15°	.5	1.1	1.6	2.1	2.6	3.2	3.9	4.7	6.3	7.9	9.5	11.1	12.6	15.8
25°	.9	1.7	2.7	3.5	4.4	5.3	6.6	8.0	10.6	13.3	15.9	18.6	21.2	26.6
30°	1.1	2.1	3.2	4.3	5.4	6.4	8.0	9.7	12.8	16.0	19.3	22.4	25.9	32.0
40°	1.4	2.9	4.3	5.8	7.2	8.7	10.9	13.0	17.4	21.6	26.2	30.6	34.9	42.8
45°	1.7	3.3	4.9	6.6	8.3	9.9	12.4	14.9	19.8	24.8	29.8	34.8	39.7	49.6
50°	1.9	3.6	5.6	7.4	9.3	11.2	14.0	16.8	22.4	28.0	33.6	39.1	44.8	56.0
60°	2.3	4.6	6.9	9.2	11.4	13.9	17.3	20.8	27.6	34.6	41.6	48.4	55.4	69.2
65°	2.5	5.1	7.6	10.2	12.7	15.2	19.1	22.9	30.5	38.1	45.8	53.2	61.0	76.4
70°	2.8	5.6	8.2	11.2	14.0	16.8	21.0	25.2	33.6	42.0	50.4	59.8	67.2	84.0
73°	2.9	5.9	8.8	11.8	14.8	17.6	22.2	26.6	36.4	44.4	53.2	62.0	71.0	88.5
75°	3.1	6.1	9.2	12.3	15.3	18.4	23.0	27.6	36.8	46.0	55.2	64.2	73.5	92.0
80°	3.4	6.7	10.1	13.4	16.8	20.1	25.2	30.2	40.2	50.2	60.4	72.5	80.8	100.0
90°	4.0	8.0	12.0	16.0	20.0	24.0	30.0	36.0	48.0	60.0	72.0	84.0	96.0	120.0
100°	4.8	9.5	14.3	19.1	23.8	28.6	35.8	42.4	57.2	71.4	86.0	100.0	114.6	143.0
120°	6.9	13.9	20.8	27.8	34.7	41.6	52.0	62.4	83.0	104.0	125.0	145.8	166.2	208.0
140°	11.0	22.0	33.0	44.0	54.9	65.9	82.4	98.9	131.9	164.8	197.8	230.8	263.8	329.7

This table is based on simple trigonometry, and the calculation of these pattern widths does not take into account gravitational effects.

Pressure Losses in Pipes and Hoses for Various Diameters at Specified Flow

Flow in GPM	Pressure Drop in PSI for Various Pipe Sizes (10 ft. length)							Pressure Drop in PSI for Various Hose Sizes (25 ft. length with no coupling)								
	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	Flow in GPM	1/4"ID	3/8"ID	1/2"ID	5/8"ID	3/4"ID	1"ID	1 1/4"ID
.2									.2	.8						
.3	.4								.3	1.5						
.4	.6	.16							.4	2.5						
.5	1.0	.24							.5	4.0	.5					
.6	1.5	.34							.6	5.0	.8					
.8	2.5	.60	.13						.8	9.0	1.3					
1.0	3.7	.89	.19	.08					1.0	1.8	1.8	.5				
1.5	8.0	1.8	.40	.13					2.0	6.0	1.5	1.5				
2.0		3.1	.65	.21	.05				3.0	13.0	3.1	1.0	1.0			
2.5		4.7	1.1	.32	.08				4.0		6.0	1.8	1.8			
3.0		6.3	1.5	.45	.11				5.0		8.5	2.5	2.5	1.0		
3.5			2.0	.60	.14				6.0		12.0	3.7	3.7	1.5		
4.0			2.5	.78	.18	.06			8.0			6.5	6.5	2.5	.6	
4.5			3.1	.98	.23	.08			10.0			9.5	9.5	3.7	1.0	
5.0			3.8	1.2	.28	.09			15.0					8.0	2.0	.7
6.0			5.2	1.5	.38	.11			20.0					14.0	3.4	1.2
8.0				2.8	.63	.20	.06		25.0						5.0	1.8
10.0				4.2	1.0	.30	.08	.04	30.0						6.5	2.5
15.0					2.2	.61	.16	.08	40.0						12.0	4.4
20.0					3.8	1.1	.29	.13	50.0							6.0
25.0						1.7	.41	.20	60.0							9.0
30.0						2.4	.59	.27	70.0							13.0
35.0							.79	.36								
40.0							1.0	.48								
50.0								.711								

NOTE: The above figures are for standard pipe of either seamless or welded construction, good clean condition. Recommended maximum capacity to keep velocity at approximately 5 feet per second is shown above heavy lines.

NOTE: The above figures are for standard hose in good, smooth condition (25 feet length with no couplings).

Capacity Tables for Flat Spray Nozzle Tips for Boom Spraying in Gallons Per Minute

TeeJet 65°

Operating Pressure in PSI	Tip No.											
	650067	6501	65015	6502	6503	6504	6505	6506	6508	6510	6515	6520
20	.05	.07	.11	.14	.21	.28	.35	.42	.56	.70	1.06	1.41
25	.055	.08	.12	.16	.24	.32	.40	.47	.63	.78	1.23	1.58
30	.06	.09	.13	.17	.26	.35	.43	.52	.69	.86	1.30	1.73
40	.067	.10	.15	.20	.30	.40	.50	.60	.80	1.00	1.50	2.00
50	.07	.11	.17	.23	.34	.45	.56	.67	.89	1.11	1.67	2.23
60	.08	.12	.18	.25	.37	.49	.61	.73	.98	1.22	1.83	2.45

Delavan 65°

Operating Pressure in PSI	Tip No.														
	LF .67	LF 1	LF 1.5	LF 2	LF 3	LF 4	LF 5	LF 6	LF 8	LF 10	LF 15				
20	.047	.071	.11	.14	.21	.28	.35	.42	.57	.71	1.1				
25	.053	.079	.12	.16	.24	.32	.40	.47	.63	.79	1.2				
30	.058	.087	.13	.17	.26	.35	.43	.52	.69	.87	1.3				
40	.067	.10	.15	.20	.30	.40	.50	.60	1.0	1.0	.15				
50	.075	.11	.17	.22	.34	.45	.56	.67	.89	1.1	1.7				
60	.082	.12	.18	.24	.37	.49	.61	.73	.98	1.2	1.8				

Capacity Tables for Flat Spray Nozzle Tips for Boom Spraying in Gallons Per Minute

TeeJet 73°

Operating Pressure in PSI	Tip No.											
	730039	730077	730116	630154	730231	730308	730385	730462	730616	730770	730924	
20	.028	.055	.08	.1	.16	.22	.27	.33	.44	.54	.65	
25	.031	.061	.09	.12	.18	.24	.30	.37	.48	.61	.73	
30	.034	.067	.10	.13	.20	.27	.33	.40	.53	.67	.80	
40	.039	.077	.116	.154	.231	.308	.385	.462	.616	.770	.924	
50	.044	.08	.13	.17	.26	.34	.43	.52	.69	.86	1.03	
60	.048	.09	.14	.19	.28	.38	.47	.57	.75	.94	1.13	

Delavan 73°

Operating Pressure in PSI	Tip No.											
	LF .77	LF 1.16	LF 1.54	LF 2.31	LF 3.08	LF 3.85	LF 4.62	LF 6.16	LF 7.70	LF 9.24	LF 25.5	
20	.054	.082	.11	.16	.22	.27	.33	.44	.54	.65	1.1	
25	.061	.092	.12	.18	.24	.30	.37	.49	.61	.73	1.2	
30	.067	.10	.13	.20	.27	.33	.40	.53	.67	.80	1.3	
40	.077	.12	.15	.23	.31	.39	.46	.62	.77	.92	1.6	
50	.086	.13	.17	.26	.34	.43	.52	.69	.86	1.0	1.7	
60	.094	.14	.19	.28	.38	.47	.57	.75	.94	1.1	1.9	

Capacity Tables for Flat Spray Nozzle Tips for Boom Spraying in Gallons Per Minute

Century 73°

Operating Pressure in PSI	Tip No.									
	5-F	10-F	20-F	30-F	40-F	5-NFS	10-NFS	12-NF	20-NF	40-NF
20					.440					
30	.069	.140	.273	.405	.540	.067	.13	.18	.30	.52
40	.079	.162	.315	.466	.622	.077	.154	.20	.33	.60
60	.098	.198	.386	.570	.760					
80					.880					
100					.983					

TeeJet 80°

Operating Pressure in PSI	Tip No.														
	80067	8001	80015	8002	8003	8004	8005	8006	8008	8010	8015	8020			
20	.05	.07	.11	.14	.21	.28	.35	.42	.56	.70	1.06	1.41			
25	.055	.08	.12	.16	.24	.32	.40	.47	.63	.78	1.23	1.58			
30	.06	.09	.13	.17	.26	.35	.43	.52	.69	.86	1.30	1.73			
40	.067	.10	.15	.20	.30	.40	.50	.60	.80	1.00	1.50	2.00			
50	.07	.11	.17	.23	.34	.45	.56	.67	.89	1.11	1.67	2.23			
60	.08	.12	.18	.25	.37	.49	.61	.73	.98	1.22	1.83	2.45			

Capacity Tables for Flat Spray Nozzle Tips for Boom Spraying in Gallons Per Minute

Delavan 80°

Operating Pressure in PSI	Tip No.														
	LF .67	LF 1	LF 1.5	LF 2	LF 3	LF 4	LF 5	LF 6	LF 8	LF 10	LF 15				
20	.047	.071	.11	.14	.21	.28	.35	.42	.57	.71	1.1				
25	.053	.079	.12	.16	.24	.32	.40	.47	.63	.79	1.2				
30	.058	.087	.13	.17	.26	.35	.43	.52	.69	.87	1.3				
40	.067	.10	.15	.20	.30	.40	.50	.60	.80	1.0	1.5				
50	.075	.11	.17	.22	.34	.45	.56	.67	.89	1.1	1.7				
60	.082	.12	.18	.24	.37	.49	.61	.73	.98	1.2	1.8				

Century 80°

Operating Pressure in PSI	Tip No.									
	4-F	8-F	11-F	15-F	21-F	25-F	31-F	41-F	50-F	
30	.059	.093	.121	.178	.236	.291	.360	.475	.585	
40	.069	.107	.140	.202	.273	.336	.405	.540	.676	
60	.084	.131	.171	.245	.331	.411	.498	.665	.827	

Capacity Tables for Even Spray Nozzle Tips for Band Spraying in Gallons Per Minute

TeeJet 80°

Operating Pressure in PSI	Tip No.									
	8001E	8015E	8002E	8003E	8004E	8005E	8006E	8008E	8010E	8015E
20	.07	.11	.14	.21	.28	.35	.42	.57	.71	1.06
30	.09	.13	.17	.26	.35	.43	.52	.69	.87	1.30
40	.10	.15	.20	.30	.40	.50	.60	.80	1.00	1.50

TeeJet 95°

Operating Pressure in PSI	Tip No.									
	9501E	95015E	9502E	9503E	9504E	9505E	9506E	9508E	9510E	9515
20	.07	.11	.14	.21	.28	.35	.42	.57	.71	1.06
30	.09	.13	.17	.26	.35	.43	.52	.69	.87	1.30
40	.10	.15	.20	.30	.40	.50	.60	.80	1.00	1.50

Capacity Tables for Even Spray Nozzle Tips for Band Spraying in Gallons Per Minute

Delavan 80°

Operating Pressure in PSI	Tip No.														
	LE-1	LE-1.5	LE-2	LE-3	LE-4	LE-5	LE-6	LE-8	LE-10	LE-15	LE-15	LE-15	LE-15	LE-15	LE-15
20	.071	.11	.14	.21	.28	.35	.42	.57	.71	1.1					
30	.087	.13	.17	.26	.35	.43	.52	.69	.87	1.3					
40	.10	.15	.20	.30	.40	.50	.60	.80	1.00	1.5					

Century 80°

Operating Pressure in PSI	Tip No.					
	0-EF	1-EF	2-EF	3-EF	4-EF	6-EF
20	.076	.099	.145	.193	.238	.380
30	.093	.131	.178	.236	.291	.475
40	.107	.140	.202	.273	.336	.540

Capacity Tables for Flooding Type Nozzle Tips in Gallons Per Minute

TeeJet Flood Jet

Operating Pressure in PSI	Tip No.													
	TK .75	TK 1	TK 1.5	TK 2	TK 2.5	TK 3	TK 5	TK 7	TK 10	TK 15	K 20	TK 30		
10	.075	.10	.15	.20	.25	.30	.50	.75	1.0	1.5	2.0	3.0		
20	.11	.14	.21	.28	.35	.42	.71	1.1	1.4	2.1	2.8	4.2		
30	.13	.17	.26	.35	.43	.52	.87	1.3	1.7	2.6	3.5	5.1		
40	.15	.20	.30	.40	.50	.60	1.0	1.5	2.0	3.0	4.0	6.0		

Delavan Type D

Operating Pressure in PSI	Tip No.									
	D 2	D 2.5	D 3	D 4	D 5	D 6	D 7.5	D 10		
10	.20	.25	.30	.40	.50	.60	.75	1.0		
20	.28	.35	.42	.57	.71	.85	1.1	1.4		
30	.35	.43	.52	.69	.87	1.0	1.3	1.7		
40	.40	.50	.60	.80	1.0	1.2	1.5	2.0		

Capacity Tables for Flooding Type Nozzle Tips in Gallons Per Minute

Century Flooding Type

Operating Pressure in PSI	Tip No.									
	TKSS .75	TKSS 1	TKSS 1.5	TKSS 2	TKSS 2.5	TKSS 3	TKSS 5	TKSS 7.5		
10	.075	.10	.15	.20	.25	.30	.50	.75		
20	.11	.14	.21	.28	.35	.42	.71	1.1		
30	.13	.17	.26	.35	.43	.52	.87	1.3		
40	.15	.20	.30	.40	.50	.60	1.0	1.5		

Capacity Tables for Cone Spray Nozzle Tips (Low Volume Fine spray) in Gallons Per Minute

TeeJet Cone Jet

Operating Pressure in PSI	Tip No.											
	TX 1	TX 2	TX 3	TX 4	TX 6	TX 8	TX 10	TX 12	TX 18	TX 26		
40	.017	.033	.05	.067	.10	.133	.167	.20	.30	.44		
60	.02	.04	.06	.082	.12	.163	.206	.245	.367	.53		
75	.023	.045	.068	.092	.137	.183	.228	.274	.41	.59		
90	.025	.05	.075	.10	.15	.20	.25	.30	.45	.65		
120	.028	.059	.087	.115	.19	.23	.29	.347	.52	.75		

Capacity Tables for Cone Spray Nozzle Tips in Gallons Per Minute

Delavan Type HB or HC

Operating Pressure in PSI	Tip No.										
	HB-1 or HC-1	HB-1.25 or HC-1.25	HB-1.5 or HC-1.5	HB-2 or HC-2	HB-2.5 or HC-2.5	HB-3 or HC-3	HB-4 or HC-4	HB-5 or HC-5	HB-6 or HC-6	HB-8 or HC-8	HB-10 or HC-10
30	.0145	.0183	.0217	.0283	.0367	.0433	.0583	.0716	.0867	.114	.145
40	.0167	.0216	.025	.033	.0416	.050	.0667	.083	.10	.133	.167
60	.020	.025	.030	.040	.051	.062	.082	.102	.122	.163	.203
75	.023	.028	.035	.045	.057	.068	.092	.113	.137	.183	.228
90	.025	.032	.038	.05	.063	.075	.10	.125	.15	.20	.25

Century Nylon Cone

Operating Pressure in PSI	Tip No.							
	2 NC	3 NC	5 NC	10 NC	20 NC	30 NC	40 NC	40 NC
30	.030	.045	.06	.13	.26	.36	.52	.52
40	.033	.04	.067	.15	.30	.39	.60	.60
60	.040	.06	.08	.18	.37	.46	.73	.73
80			.09	.21	.42	.53	.85	.85

**Capacity Tables for Disc Type Cone Spray Tips for High Volume
and High Pressure Spraying in Gallons Per Minute**

TeeJet

Operating Pressure in PSI	Combination Disc and Core No.									
	D2-13	D2-23	D3-23	D2-25	D3-25	D3-45	D4-25	D4-45	D5-45	
40	.08	.10	.12	.16	.19	.23	.29	.36	.45	
60	.10	.13	.14	.19	.23	.28	.35	.43	.55	
80	.11	.14	.16	.22	.26	.33	.40	.50	.64	
100	.12	.16	.18	.25	.29	.36	.45	.56	.71	
150	.14	.19	.21	.29	.35	.44	.54	.68	.86	
250	.17	.23	.26	.37	.44	.56	.68	.86	1.11	
400	.21	.28	.32	.46	.55	.71	.86	1.11	1.40	

Operating Pressure in PSI	Combination Disc and Core No.							
	D7-25	D6-45	D7-45	D10-25	D6-46	D7-56	D8-56	40 NC
40	.52	.58	.68	.76	.93	1.10	1.52	1.93
60	.63	.72	.84	.93	1.15	1.35	1.86	2.36
80	.73	.83	.97	1.07	1.32	1.58	2.15	2.73
100	.81	.93	1.11	1.21	1.47	1.73	2.40	3.05
150	.98	1.15	1.35	1.48	1.81	2.16	2.94	3.73
250	1.27	1.48	1.75	1.90	2.32	2.78	3.80	4.82
400	1.59	1.90	2.25	2.40	2.95	3.52	4.81	6.10

**Capacity Tables for Disc Cone Spray Nozzle Tips (High Volume and High Pressure)
in Gallons Per Minute**

Delavan Type DC

Operating Pressure in PSI	Disc and Core No.									
	DC2-13	DC2-23	DC2-25	DC3-13	DC3-23	DC3-25	DC3-45	DC3-46	DC4-13	
40	.08	.10	.16	.09	.12	.19	.23	.32	.12	
60	.10	.13	.19	.11	.14	.23	.28	.39	.14	
80	.11	.14	.22	.12	.16	.26	.33	.45	.16	
100	.12	.16	.25	.13	.18	.29	.36	.51	.17	
150	.14	.19	.29	.16	.21	.35	.44	.61	.20	
250	.17	.23	.37	.20	.26	.45	.56	.78	.25	
400	.21	.28	.46	.23	.32	.55	.71	.99	.30	

Operating Pressure in PSI	Disc and Core No.									
	DC4-25	DC5-23	DC5-45	DC5-46	DC6-23	DC6-25	DC6-45	DC6-46		
40	.29	.18	.45	.77	.21	.44	.58	1.10		
60	.35	.22	.55	.94	.26	.54	.72	1.35		
80	.40	.25	.64	1.10	.29	.62	.83	1.58		
100	.45	.28	.71	1.25	.32	.70	.93	1.73		
150	.54	.34	.86	1.50	.39	.85	1.15	2.16		
250	.69	.43	1.10	1.93	.50	1.10	1.48	2.79		
400	.86	.53	1.40	2.47	.62	1.37	1.90	3.52		

**Capacity Tables for Disc Cone Spray Nozzle Tips (High Volume and High Pressure)
in Gallons Per Minute**

Delavan Type DC

Operating Pressure in PSI	Disc and Core No.									
	DC7-25	DC7-45	DC7-46	DC8-25	DC8-45	DC8-46	DC10-45	DC10-46	DC10-46	DC10-46
40	.52	.68	1.39	.61	.84	1.84	1.10	2.48		
60	.63	.84	1.72	.75	1.04	2.25	1.35	3.05		
80	.73	.97	1.97	.89	1.21	2.62	1.57	3.53		
100	.81	1.11	2.22	.97	1.35	2.93	1.77	3.96		
150	.98	1.35	2.73	1.19	1.68	3.60	2.18	4.83		
250	1.27	1.74	3.52	1.54	2.17	4.64	2.81	6.22		
400	1.59	2.25	4.42	1.94	2.78	5.88	3.60	7.90		

Size Selection of Spray Tip or Nozzle

Based on the chemical manufacturer's recommendations on GPA application rates and nozzle tips, a suitable spray tip size is chosen from the catalog tabulations. Since all the tabulations are based on spraying water, which weighs 8.34 lbs. per US gallon, conversion factors should be used when spraying solutions which are heavier or lighter than water. Using conversion factors from the tables below, multiply by the catalog tabulated GPM and GPA rates — to arrive at the values for solution to be sprayed.

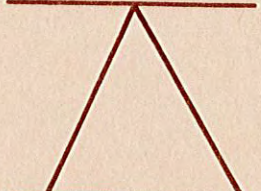
Weight of Solution	Specific Gravity	Conversion Factors
7.0 lbs. per gallon	.84	1.09
8.0 lbs. per gallon	.96	1.02
8.34 lbs. per gallon — WATER	1.00	1.00
9.0 lbs. per gallon	1.08	.96
10.0 lbs. per gallon	1.20	.91
11.0 lbs. per gallon	1.32	.87
12.0 lbs. per gallon	1.44	.83
14.0 lbs. per gallon	1.68	.77
16.0 lbs. per gallon	1.92	.72
18.0 lbs. per gallon	2.16	.68
20.0 lbs. per gallon	2.40	.65

Imperial Gallon = 1.20 U.S.A. Gallons

Other Useful Information

Adjust the spray height to give proper spray overlap.

Suggested Minimum Spray Heights

Spray Angle	Spray Height		Spray Height	
	20" Spacing	30" Spacing		
65°	21" to 23"	32" to 34"	 	
73°	20" to 22"	27" to 29"		
80°	17" to 19"	24" to 26"		

Tractor Speeds

Speed in MPH (Miles Per Hour)	Time Required in Seconds to Travel a Distance of:		
	100 feet	200 feet	300 feet
3.0	23.0	45.0	68.0
3.5	20.0	39.0	58.0
4.0	17.0	34.0	51.0
4.5	15.0	30.0	45.0
5.0	14.0	27.0	41.0
6.0	11.0	23.0	34.0
7.0	9.7	19.0	29.0
7.5	9.0	18.0	27.0
8.0	8.5	17.0	26.0
9.0	7.6	15.0	23.0
10.0	6.8	14.0	20.0
12.0	5.7	11.0	17.0
15.0	4.5	9.0	13.6
20.0	3.4	6.8	10.2

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Billy G. Hicks, Dean