



Nozzle Selection Guide for Multi-Pro[®] Sprayers and Workman[®] Vehicles

Form No. 3351-389 Rev B

Selection Guide

Using the Nozzle Selection Tables

Note: The Unit Definitions and Conversions table is located on page 11.

Note: Toro recommends a vehicle speed of 3 to 5 MPH (5 to 9 km/h) and a nozzle pressure of 30–50 psi (2.0–3.5 Bar) while spraying.

The nozzle selection tables show application rates using specific nozzles while the vehicle travels at a various speeds.

The tables show nozzle application rates in US Gallons per Acre, US Gallons per 1,000 ft² and Liters per Hectare. Each table is organized by nozzle and each nozzle has a range of pressures and vehicle speeds listed.

See the nozzle selection tables in the following section to ensure that your spray nozzles have the capacity necessary to achieve the desired application rate.

- The table can be used to select the correct nozzle.

Find the desired application rate within the appropriate table at the preferred vehicle speed and pressure, then select the nozzle that is listed in the left columns.

Example:

The desired application rate is 24 GPA for the material to be sprayed. The preferred vehicle speed is 5 MPH. The desired pressure range is 30-50 psi.

Find the desired speed column at the top of the table. Follow that column down until you see your desired rate within the 30-50 psi pressure range.

As listed in the table, the nozzle with Toro part number 95-9222 has an application rate of 23.8 GPA when the vehicle speed is 5 MPH and pressure would be 40 psi.

- The table can be used to verify that a spray nozzle has the capacity necessary to achieve the application rate selected.

Find the nozzle in the left columns of the appropriate table, then look for application rate within that section by varying vehicle speed and/or pressure.

Example:

The yellow nozzle with Toro part number 95-9221 is the only nozzle available and the material to be sprayed has an application rate of 20 GPA.

If vehicle speed is slowed to 3.5 MPH and pressure is raised to 60 psi one can achieve an application rate of 20.4 GPA with the yellow nozzle.

Selecting a Nozzle

GPA or US Gallons per 1000 ft²

1. Determine the desired application rate from the manufacturer's labeling.
_____ Gallons per acre or per 1000 ft²
2. Determine the vehicle speed to apply the material.
_____ MPH
3. Verify that the nozzle spacing is 20 inches.
4. Determine the Gallons per Minute using either the appropriate Nozzle Selection Table or GPM formula on page 12.
_____ GPM
5. Select nozzle size based on GPM.
6. Once the nozzle is installed, spray water for initial test/calibration. Please refer to the Calibrating the Spray Pro[™] Monitor section in the Operator's Manual. Use the Application Rate Switch to increase or decrease the application rate.

Liters per Hectare

1. Determine the desired application rate from the manufacturer's labeling.
_____ Liters per Hectare
2. Determine the vehicle speed to apply the material.
_____ KmPH
3. Verify that the nozzle spacing is 50 centimeters.
4. Determine the Liters per Hectare using either the appropriate Nozzle Selection Tables or Liters per Hectare formulas on page 12.
_____ Liters per Hectare
5. Select nozzle size based on Liters per Hectare.
6. Once the nozzle is installed, spray water for initial test/calibration. Please refer to the Calibrating the Spray Pro Monitor section in the Operator's Manual. Use the Application Rate Switch to increase or decrease the application rate.

Nozzle Selection Tables

Important All application rates have been calculated using a nozzle spacing set up by the manufacturer (20 inches or 50 cm). If the nozzle spacing is changed, these application rates will no longer apply.

US Gallons per Acre Application Rates - Standard Booms

Toro Part Number	Nozzle Number - Color Code	Pressure (psi)	Capacity 1 Nozzle (GPM)	US Gallons per Acre at 20 Inch Spacings							
				<i>First Gear</i>		<i>Second Gear</i>				<i>Third Gear</i>	
				2.5 MPH	3 MPH	3.5 MPH	4 MPH	4.5 MPH	5 MPH	5.5 MPH	6 MPH
95-9221	1/4TTJ02 -VS Yellow	25	0.16	19.0	15.8	13.6	11.9	10.6	9.5	8.6	7.9
		30	0.17	20.2	16.8	14.4	12.6	11.2	10.1	9.2	8.4
		40	0.20	23.8	19.8	17.0	14.9	13.2	11.9	10.8	9.9
		50	0.22	26.1	21.8	18.7	16.3	14.5	13.1	11.9	10.9
		60	0.24	28.5	23.8	20.4	17.8	15.8	14.3	13.0	11.9
		75	0.27	32.1	26.7	22.9	20.0	17.8	16.0	14.6	13.4
95-9222	1/4TTJ04 -VS Red	25	0.32	38.0	31.7	27.2	23.8	21.1	19.0	17.3	15.8
		30	0.35	41.6	34.7	29.7	26.0	23.1	20.8	18.9	17.3
		40	0.40	47.5	39.6	33.9	29.7	26.4	23.8	21.6	19.8
		50	0.45	53.5	44.6	38.2	33.4	29.7	26.7	24.3	22.3
		60	0.49	58.2	48.5	41.6	36.4	32.3	29.1	26.5	24.3
		75	0.55	65.3	54.5	46.7	40.8	36.3	32.7	29.7	27.2
95-9223	1/4TTJ05 -VS Brown	25	0.40	47.5	39.6	33.9	29.7	26.4	23.8	21.6	19.8
		30	0.43	51.1	42.6	36.5	31.9	28.4	25.5	23.2	21.3
		40	0.50	59.4	49.5	42.4	37.1	33.0	29.7	27.0	24.8
		50	0.56	66.5	55.4	47.5	41.6	37.0	33.3	30.2	27.7
		60	0.61	72.5	60.0	51.8	45.3	40.3	36.2	32.9	30.2
		75	0.68	80.8	67.3	57.7	50.5	44.9	40.4	36.7	33.7
95-9224	1/4TTJ06 -VS Gray	25	0.47	55.8	46.5	39.9	34.9	31.0	27.9	25.4	23.3
		30	0.52	61.8	51.5	44.1	38.6	34.3	30.9	28.1	25.7
		40	0.60	71.3	59.4	50.9	44.6	39.6	35.6	32.4	29.7
		50	0.67	79.6	66.3	56.9	49.7	44.2	39.8	36.2	33.2
		60	0.73	86.7	72.3	61.9	54.2	48.2	43.4	39.4	36.1
		75	0.82	97.4	81.2	69.6	60.9	54.1	48.7	44.3	40.6
95-9225	1/4TTJ08 -VS White	25	0.63	74.8	62.4	53.5	46.8	41.6	37.4	34.0	31.2
		30	0.69	82.0	68.3	58.6	51.2	45.5	41.0	37.3	34.2
		40	0.80	95.0	79.2	67.9	59.4	52.8	47.5	43.2	39.6
		50	0.89	105.7	88.1	75.5	66.1	58.7	52.9	48.1	44.1
		60	0.98	116.4	97.0	83.2	72.8	64.7	58.2	52.9	48.5
		75	1.10	130.7	108.9	93.3	81.7	72.6	65.3	59.4	54.5
95-9188	1/4TTJ10 -VS Light Blue	25	0.79	93.9	78.2	67.0	58.7	52.1	46.9	42.7	39.1
		30	0.87	103.4	86.1	73.8	64.6	57.4	51.7	47.0	43.1
		40	1.00	118.8	99.0	84.9	74.3	66.0	59.4	54.0	49.5
		50	1.12	133.1	110.9	95.0	83.2	73.9	66.5	60.5	55.4
		60	1.22	144.9	120.8	103.5	90.6	80.5	72.5	65.9	60.4
		75	1.37	162.8	135.6	116.3	101.7	90.4	81.4	74.0	67.8
95-9226	1/4TTJ15 -VS Light Green	25	1.19	141.4	117.8	101.0	88.4	78.5	70.7	64.3	58.9
		30	1.30	154.4	128.7	110.3	96.5	85.8	77.2	70.2	64.4
		40	1.50	178.2	148.5	127.3	111.4	99.0	89.1	81.0	74.3
		50	1.68	199.6	166.3	142.6	124.7	110.9	99.8	90.7	83.2
		60	1.84	218.6	182.2	156.1	136.6	121.4	109.3	99.4	91.1
		75	2.05	243.5	203.0	174.0	152.2	135.3	121.8	110.7	101.5

Italicized gear ranges are applicable to Multi-Pro 1200 and 1250 Sprayers only.

**US Gallons per 1000 ft² Application Rates
- Standard Booms**

Toro Part Number	Nozzle Number - Color Code	Pressure (psi)	Capacity 1 Nozzle (GPM)	US Gallons per 1000 ft ² at 20 Inch Spacings							
				<i>First Gear</i>		<i>Second Gear</i>				<i>Third Gear</i>	
				2.5 MPH	3 MPH	3.5 MPH	4 MPH	4.5 MPH	5 MPH	5.5 MPH	6 MPH
95-9221	1/4TTJ02 -VS Yellow	25	0.16	0.44	0.36	0.31	0.27	0.24	0.22	0.20	0.18
		30	0.17	0.46	0.39	0.33	0.29	0.26	0.23	0.21	0.19
		40	0.20	0.54	0.45	0.39	0.34	0.30	0.27	0.25	0.23
		50	0.22	0.60	0.50	0.43	0.37	0.33	0.30	0.27	0.25
		60	0.24	0.66	0.54	0.47	0.41	0.36	0.33	0.30	0.27
		75	0.27	0.73	0.61	0.52	0.46	0.41	0.37	0.33	0.31
95-9222	1/4TTJ04 -VS Red	25	0.32	0.87	0.73	0.62	0.54	0.48	0.44	0.40	0.36
		30	0.35	0.95	0.79	0.68	0.60	0.53	0.48	0.43	0.40
		40	0.40	1.09	0.91	0.78	0.68	0.60	0.54	0.49	0.45
		50	0.45	1.22	1.02	0.87	0.77	0.68	0.61	0.56	0.51
		60	0.49	1.32	1.11	0.95	0.83	0.74	0.67	0.61	0.56
		75	0.55	1.50	1.25	1.07	0.94	0.83	0.75	0.68	0.62
95-9223	1/4TTJ05 -VS Brown	25	0.40	1.09	0.91	0.78	0.68	0.60	0.54	0.49	0.45
		30	0.43	1.17	0.97	0.84	0.73	0.65	0.58	0.53	0.49
		40	0.50	1.36	1.13	0.97	0.85	0.76	0.68	0.62	0.57
		50	0.56	1.52	1.27	1.09	0.95	0.85	0.76	0.69	0.63
		60	0.61	1.66	1.38	1.19	1.04	0.92	0.83	0.75	0.69
		75	0.68	1.85	1.54	1.32	1.16	1.03	0.92	0.84	0.77
95-9224	1/4TTJ06 -VS Gray	25	0.47	1.28	1.07	0.91	0.80	0.71	0.64	0.58	0.53
		30	0.52	1.41	1.18	1.01	0.88	0.79	0.71	0.64	0.59
		40	0.60	1.63	1.36	1.17	1.02	0.91	0.82	0.74	0.68
		50	0.67	1.82	1.52	1.30	1.14	1.01	0.91	0.83	0.76
		60	0.73	1.99	1.65	1.42	1.24	1.10	0.99	0.90	0.83
		75	0.82	2.23	1.86	1.59	1.39	1.24	1.12	1.01	0.93
95-9225	1/4TTJ08 -VS White	25	0.63	1.71	1.43	1.22	1.07	0.95	0.86	0.78	0.71
		30	0.69	1.88	1.56	1.34	1.17	1.04	0.94	0.85	0.78
		40	0.80	2.18	1.81	1.55	1.36	1.21	1.09	0.99	0.91
		50	0.89	2.42	2.02	1.73	1.51	1.34	1.21	1.10	1.01
		60	0.98	2.67	2.22	1.90	1.67	1.48	1.33	1.21	1.11
		75	1.10	2.99	2.49	2.14	1.87	1.66	1.50	1.36	1.25
95-9188	1/4TTJ10 -VS Light Blue	25	0.79	2.15	1.79	1.53	1.34	1.19	1.07	0.98	0.90
		30	0.87	2.37	1.97	1.69	1.48	1.31	1.18	1.08	0.99
		40	1.00	2.72	2.27	1.94	1.70	1.51	1.36	1.24	1.13
		50	1.12	3.05	2.54	2.18	1.90	1.69	1.52	1.38	1.27
		60	1.22	3.32	2.77	2.37	2.07	1.84	1.66	1.51	1.38
		75	1.37	3.73	3.11	2.66	2.33	2.07	1.86	1.69	1.55
95-9226	1/4TTJ15 -VS Light Green	25	1.19	3.24	2.70	2.31	2.02	1.80	1.62	1.47	1.35
		30	1.30	3.54	2.95	2.53	2.21	1.96	1.77	1.61	1.47
		40	1.50	4.08	3.40	2.91	2.55	2.27	2.04	1.85	1.70
		50	1.68	4.57	3.81	3.26	2.86	2.54	2.28	2.08	1.90
		60	1.84	5.00	4.17	3.57	3.13	2.78	2.50	2.27	2.09
		75	2.05	5.58	4.65	3.98	3.49	3.10	2.79	2.53	2.32

Italicized gear ranges are applicable to Multi-Pro 1200 and 1250 Sprayers only.

Liters per Hectare Application Rates - Standard Booms

Toro Part Number	Nozzle Number - Color Code	Pressure (Bar)	Capacity 1 Nozzle (L/min)	Liters per Hectare at 50 Centimeter Spacings							
				<i>First Gear</i>		<i>Second Gear</i>			<i>Third Gear</i>		
				4.0 km/h	4.8 km/h	5.6 km/h	6.4 km/h	7.2 km/h	8.0 km/h	8.8 km/h	9.7 km/h
95-9221	1/4TTJ02 -VS Yellow	1.72	0.61	182	151	130	114	101	91	83	75
		2.06	0.64	193	161	138	121	107	97	88	80
		2.76	0.76	227	189	162	142	126	114	103	94
		3.45	0.83	250	208	178	156	139	125	114	103
		4.13	0.91	273	227	195	170	151	136	124	112
		5.17	1.02	307	255	219	192	170	153	139	126
95-2222	1/4TTJ04 -VS Red	1.72	1.21	363	303	260	227	202	182	165	150
		2.06	1.32	397	331	284	248	221	199	181	164
		2.76	1.51	454	379	324	284	252	227	206	187
		3.45	1.70	511	426	365	319	284	255	232	211
		4.13	1.85	556	464	397	348	309	278	253	229
		5.17	2.08	625	520	446	390	347	312	284	258
95-2223	1/4TTJ05 -VS Brown	1.72	1.51	454	379	324	284	252	227	206	187
		2.06	1.63	488	407	349	305	271	244	222	201
		2.76	1.89	568	473	406	355	315	284	258	234
		3.45	2.12	636	530	454	397	353	318	289	262
		4.13	2.31	693	577	495	433	385	346	315	286
		5.17	2.57	772	643	552	483	429	386	351	378
95-2224	1/4TTJ06 -VS Gray	1.72	1.78	534	445	381	334	296	267	243	220
		2.06	1.97	590	492	422	369	328	295	268	243
		2.76	2.27	681	568	487	426	379	341	310	281
		3.45	2.54	761	634	543	475	423	380	346	314
		4.13	2.76	829	691	592	518	461	414	377	342
		5.17	3.10	931	776	665	582	517	466	423	384
95-9225	1/4TTJ08 -VS White	1.72	2.38	715	596	511	447	397	358	325	295
		2.06	2.61	783	653	560	490	435	392	356	353
		2.76	3.03	908	757	649	568	505	454	413	375
		3.45	3.37	1011	842	722	632	561	505	459	417
		4.13	3.71	1113	927	795	695	618	556	506	459
		5.17	4.16	1249	1041	892	781	694	625	568	515
95-9188	1/4TTJ10 -VS Light Blue	1.72	2.99	897	748	641	561	498	449	408	370
		2.06	3.29	988	823	706	617	549	494	449	407
		2.76	3.79	1136	946	811	710	631	568	516	468
		3.45	4.24	1272	1060	908	795	707	636	578	524
		4.13	4.62	1385	1154	990	866	770	693	630	571
		5.17	5.19	1556	1296	1111	972	864	778	707	641
95-2226	1/4TTJ15 -VS Light Green	1.72	4.50	1351	1126	965	845	751	676	614	557
		2.06	4.92	1476	1230	1054	923	820	738	671	609
		2.76	5.68	1703	1419	1217	1065	946	852	774	702
		3.45	6.36	1908	1590	1363	1192	1060	954	867	787
		4.13	6.96	2089	1741	1492	1306	1161	1045	950	862
		5.17	7.76	2328	1940	1663	1455	1293	1064	1058	960

Italicized gear ranges are applicable to Multi-Pro 1200 and 1250 Sprayers only.

US Gallons per Acre Application Rates - Covered Booms

Toro Part Number	Nozzle Number - Color Code	Pressure (psi)	Capacity 1 Nozzle (GPM)	US Gallons per Acre at 20 Inch Spacings							
				<i>First Gear</i>		<i>Second Gear</i>			<i>Third Gear</i>		
				2.5 MPH	3 MPH	3.5 MPH	4 MPH	4.5 MPH	5 MPH	5.5 MPH	6 MPH
94-8714	XR11004 -VS 110° Red	20	0.28	33.3	27.7	23.8	20.8	18.5	16.6	15.1	13.9
		30	0.35	41.6	34.7	29.7	26.0	23.1	20.8	18.9	17.3
		40	0.40	47.5	39.6	33.9	29.7	26.4	23.8	21.6	19.8
		50	0.45	53.5	44.6	38.2	33.4	29.7	26.7	24.3	22.3
		60	0.49	58.2	48.5	41.6	36.4	32.3	29.1	26.5	24.3
94-8715	XR11005 -VS 110° Brown	20	0.35	41.6	34.7	29.7	26.0	23.1	20.8	18.9	17.3
		30	0.43	51.1	42.6	36.5	31.9	28.4	25.5	23.2	21.3
		40	0.50	59.4	49.5	42.4	37.1	33.0	29.7	27.0	24.8
		50	0.56	66.5	55.4	47.5	41.6	37.0	33.3	30.2	27.7
		60	0.61	72.5	60.4	51.8	45.3	40.3	36.2	32.9	30.2
94-8716	XR11006 -VS 110° Gray	20	0.42	49.9	41.6	35.6	31.2	27.7	24.9	22.7	20.8
		30	0.52	61.8	51.5	44.1	38.6	34.3	30.9	28.1	25.7
		40	0.60	71.3	59.4	50.9	44.6	39.6	35.6	32.4	29.7
		50	0.67	79.6	66.3	59.6	49.7	44.2	39.8	36.2	33.2
		60	0.73	86.7	72.3	61.9	54.2	48.2	43.4	39.4	36.1
94-8717	XR11008 -VS 110° White	20	0.57	67.7	56.4	48.4	42.3	37.6	33.9	30.8	28.2
		30	0.69	82.0	68.3	58.6	51.2	45.5	41.0	37.3	34.2
		40	0.80	95.0	79.2	67.9	59.4	52.8	47.5	43.2	39.6
		50	0.89	105.7	88.1	75.5	66.1	58.7	52.9	48.1	44.1
		60	0.98	116.4	97.0	83.2	72.8	64.7	58.2	52.9	48.5
94-8718	XR11010 -SS 110° Stainless	20	0.71	84.3	70.3	60.2	52.7	46.9	42.2	38.3	35.1
		30	0.87	103.4	86.1	73.8	64.6	57.4	51.7	47.0	43.1
		40	1.00	118.8	99.0	84.9	74.3	66.0	59.4	54.0	49.5
		50	1.12	133.1	110.9	95.0	83.2	73.9	66.5	60.5	55.4
		60	1.22	144.9	120.8	103.5	90.6	80.5	72.5	65.9	60.4
94-8719	XR11015 -SS 110° Stainless	20	1.06	125.9	104.9	89.9	78.7	70.0	63.0	57.2	52.5
		30	1.30	154.4	128.7	110.3	96.5	85.8	77.2	70.2	64.4
		40	1.50	178.2	148.5	127.3	111.4	99.0	89.1	81.0	74.3
		50	1.68	199.6	166.3	142.6	124.7	110.9	99.8	90.7	83.2
		60	1.84	218.6	182.2	156.1	136.6	121.4	109.3	99.4	91.1

Note: Lower pressures produce larger droplets and help reduce mist under the covered boom.

Italicized gear ranges are applicable to Multi-Pro 1200 and 1250 Sprayers only.

US Gallons per 1000 ft² Application Rates - Covered Booms

Toro Part Number	Nozzle Number - Color Code	Pressure (psi)	Capacity 1 Nozzle (GPM)	US Gallons per 1000 ft ² at 20 Inch Spacings							
				<i>First Gear</i>		<i>Second Gear</i>			<i>Third Gear</i>		
				2.5 MPH	3 MPH	3.5 MPH	4 MPH	4.5 MPH	5 MPH	5.5 MPH	6 MPH
94-8714	XR11004 -VS 110° Red	20	0.28	0.76	0.63	0.54	0.48	0.42	0.38	0.35	0.32
		30	0.35	0.95	0.79	0.68	0.60	0.53	0.48	0.43	0.40
		40	0.40	1.09	0.91	0.78	0.68	0.60	0.54	0.49	0.45
		50	0.45	1.22	1.02	0.87	0.77	0.68	0.61	0.56	0.51
		60	0.49	1.33	1.11	0.95	0.83	0.74	0.67	0.61	0.56
94-8715	XR11005 -VS 110° Brown	20	0.35	0.95	0.79	0.68	0.60	0.53	0.48	0.43	0.40
		30	0.43	1.17	0.97	0.84	0.73	0.65	0.58	0.53	0.49
		40	0.50	1.36	1.13	0.97	0.85	0.76	0.68	0.62	0.57
		50	0.56	1.52	1.27	1.09	0.95	0.85	0.76	0.69	0.63
		60	0.61	1.66	1.38	1.19	1.04	0.92	0.83	0.75	0.69
94-8716	XR11006 -VS 110° Gray	20	0.42	1.14	0.95	0.82	0.71	0.63	0.57	0.52	0.48
		30	0.52	1.41	1.18	1.01	0.88	0.79	0.71	0.64	0.59
		40	0.60	1.63	1.36	1.17	1.02	0.91	0.82	0.74	0.68
		50	0.67	1.82	1.52	1.30	1.14	1.01	0.91	0.83	0.76
		60	0.73	1.99	1.65	1.42	1.24	1.10	0.99	0.90	0.83
94-8717	XR11008 -VS 110° White	20	0.57	1.55	1.29	1.11	0.97	0.86	0.78	0.70	0.65
		30	0.69	1.88	1.56	1.34	1.17	1.04	0.94	0.85	0.78
		40	0.80	2.18	1.81	1.55	1.36	1.21	1.09	0.99	0.91
		50	0.89	2.42	2.02	1.73	1.51	1.34	1.21	1.10	1.01
		60	0.98	2.67	2.22	1.90	1.67	1.48	1.33	1.21	1.11
94-8718	XR11010 -SS 110° Stainless	20	0.71	1.93	1.61	1.38	1.21	1.07	0.97	0.88	0.80
		30	0.87	2.37	1.97	1.69	1.48	1.31	1.18	1.08	0.99
		40	1.00	2.72	2.27	1.94	1.70	1.51	1.36	1.24	1.13
		50	1.12	3.05	2.54	2.18	1.90	1.69	1.52	1.38	1.27
		60	1.22	3.32	2.77	2.37	2.07	1.84	1.66	1.51	1.38
94-8719	XR11015 -SS 110° Stainless	20	1.06	2.88	2.40	2.06	1.80	1.60	1.44	1.31	1.20
		30	1.30	3.54	2.95	2.53	2.21	1.96	1.77	1.61	1.47
		40	1.50	4.08	3.40	2.91	2.55	2.27	2.04	1.85	1.70
		50	1.68	4.57	3.81	3.26	2.86	2.54	2.28	2.08	1.90
		60	1.84	5.00	4.17	3.57	3.13	2.78	2.50	2.27	2.09

Note: Lower pressures produce larger droplets and help reduce mist under the covered boom.

Italicized gear ranges are applicable to Multi-Pro 1200 and 1250 Sprayers only.

Liters per Hectare Application Rates - Covered Booms

Toro Part Number	Nozzle Number - Color Code	Pressure (Bar)	Capacity 1 Nozzle (L/min)	Liters per Hectare at 50 Centimeter Spacings							
				<i>First Gear</i>		<i>Second Gear</i>				<i>Third Gear</i>	
				4.0 km/h	4.8 km/h	5.6 km/h	6.4 km/h	7.2 km/h	8.0 km/h	8.8 km/h	9.7 km/h
94-8714	XR11004 -VS 110° Red	1.38	1.06	316	263	226	197	176	158	144	132
		2.07	1.32	395	329	282	247	220	197	180	165
		2.76	1.51	452	376	323	282	251	226	205	188
		3.45	1.70	508	423	363	317	282	254	231	212
		4.14	1.85	554	461	395	346	307	276	251	231
94-8715	XR11005 -VS 110° Brown	1.38	1.32	395	329	282	247	220	197	180	165
		2.07	1.63	486	404	347	303	270	243	221	202
		2.76	1.89	565	470	403	353	314	282	257	235
		3.45	2.12	633	527	452	395	351	316	287	264
		4.14	2.31	689	574	492	430	383	344	313	287
94-8716	XR11006 -VS 110° Gray	1.38	1.59	475	395	339	296	263	237	216	198
		2.07	1.97	588	489	420	367	326	293	267	245
		2.76	2.27	678	564	484	423	376	339	308	282
		3.45	2.54	757	630	541	473	420	378	344	315
		4.14	2.76	825	686	589	515	458	412	375	344
94-8717	XR11008 -VS 110° White	1.38	2.16	644	536	460	402	358	322	293	268
		2.07	2.61	780	649	557	487	433	389	354	325
		2.76	3.03	904	752	645	564	502	451	411	377
		3.45	3.37	1006	837	718	628	558	502	457	419
		4.14	3.71	1107	922	791	691	615	553	503	461
94-8718	XR11010 -SS 110° Stainless	1.38	2.69	802	668	573	501	445	401	364	334
		2.07	3.29	983	818	702	614	546	491	447	406
		2.76	3.79	1130	940	807	705	627	564	513	471
		3.45	4.24	1265	1053	904	790	703	632	575	527
		4.14	4.62	1378	1147	984	860	765	688	626	574
94-8719	XR11015 -SS 110° Stainless	1.38	4.01	1198	997	855	748	665	598	544	499
		2.07	4.92	1469	1222	1049	917	816	733	667	612
		2.76	5.68	1695	1411	1210	1058	941	846	770	706
		3.45	6.36	1898	1580	1355	1185	1054	948	862	791
		4.14	6.96	2079	1730	1484	1298	1154	1038	944	866

Note: Lower pressures produce larger droplets and help reduce mist under the covered boom.

Italicized gear ranges are applicable to Multi-Pro 1200 and 1250 Sprayers only.

US Gallons per Acre Application Rates - Covered Walking Boom

Toro Part Number	Nozzle Number - Color Code	Pressure (psi)*	Capacity 1 Nozzle (GPM)	US Gallons per Acre at 20 Inch Spacings					
				Walking Speed					
				1.0 MPH	1.5 MPH	2.0 MPH	2.5 MPH	3.0 MPH	3.5 MPH
94-8714	XR11004 -VS Red	15	0.32	95.0	63.4	47.5	38.0	31.7	27.2
		20	0.35	104.0	69.3	52.0	41.6	34.7	29.7
		25	0.40	118.8	79.2	59.4	47.5	39.6	33.9
		30	0.45	133.7	89.1	66.8	53.5	44.6	38.2
		35	0.49	145.5	97.0	72.8	58.2	48.5	41.6
		40	0.55	163.4	108.9	81.7	65.3	54.5	46.7
94-8715	XR11005 -VS Brown	15	0.40	118.8	79.2	59.4	47.5	39.6	33.9
		20	0.43	127.7	85.1	63.9	51.1	42.6	36.5
		25	0.50	148.5	99.0	74.3	59.4	49.5	42.4
		30	0.56	166.3	110.9	83.2	66.5	55.4	47.5
		35	0.61	181.2	120.8	90.6	72.5	60.4	51.8
		40	0.68	202.0	134.6	101.0	80.8	67.3	57.7
94-8716	XR11006 -VS Gray	15	0.47	139.6	93.1	69.8	55.8	46.5	39.9
		20	0.52	154.4	103.0	77.2	61.8	51.5	44.1
		25	0.60	178.2	118.8	89.1	71.3	59.4	50.9
		30	0.67	199.0	132.7	99.5	79.6	66.3	56.9
		35	0.73	216.8	144.5	108.4	86.7	72.3	61.9
		40	0.82	243.5	162.4	121.8	97.4	81.2	69.6
94-8717	XR11008 -VS White	15	0.63	187.1	124.7	93.6	74.8	62.4	53.5
		20	0.69	204.9	136.6	102.5	82.0	68.3	58.6
		25	0.80	237.6	158.4	118.8	95.0	79.2	67.9
		30	0.89	264.3	176.2	132.2	105.7	88.1	75.5
		35	0.98	291.1	194.0	145.5	116.4	97.0	83.2
		40	1.10	326.7	217.8	163.4	130.7	108.9	93.3
94-8718	XR11010 -SS Stainless	15	0.79	234.6	156.4	117.3	93.9	78.2	67.0
		20	0.87	258.4	172.3	129.2	103.4	86.1	73.8
		25	1.00	297.0	198.0	148.5	118.8	99.0	84.9
		30	1.12	332.6	221.8	166.3	133.1	110.9	95.0
		35	1.22	362.3	241.6	181.2	144.9	120.8	103.5
		40	1.37	406.9	271.3	203.4	162.8	135.6	116.3
94-8719	XR11015 -SS Stainless	15	1.19	353.4	235.6	176.7	141.4	117.8	101.0
		20	1.30	386.1	257.4	193.1	154.4	128.7	110.3
		25	1.50	445.5	297.0	222.8	178.2	148.5	127.3
		30	1.68	499.0	332.6	249.5	199.6	166.3	142.6
		35	1.84	546.5	364.3	273.2	218.6	182.2	156.1
		40	2.05	608.9	405.9	304.4	243.5	203.0	174.0

*This is the pressure at the nozzle. System pressure may be set higher.

**US Gallons per 1000 ft² Application Rates
- Covered Walking Boom**

Toro Part Number	Nozzle Number - Color Code	Pressure (psi)*	Capacity 1 Nozzle (GPM)	US Gallons per 1000 ft ² at 20 Inch Spacings					
				Walking Speed					
				1.0 MPH	1.5 MPH	2.0 MPH	2.5 MPH	3.0 MPH	3.5 MPH
94-8714	XR11004 -VS Red	15	0.32	2.18	1.45	1.09	0.87	0.73	0.62
		20	0.35	2.38	1.59	1.19	0.95	0.79	0.68
		25	0.40	2.72	1.81	1.36	1.09	0.91	0.78
		30	0.45	3.06	2.04	1.53	1.22	1.02	0.87
		35	0.49	3.33	2.22	1.67	1.33	1.11	0.95
		40	0.55	3.74	2.49	1.87	1.50	1.25	1.07
94-8715	XR11005 -VS Brown	15	0.40	2.72	1.81	1.36	1.09	0.91	0.78
		20	0.43	2.92	1.95	1.46	1.17	0.97	0.84
		25	0.50	3.40	2.27	1.70	1.36	1.13	0.97
		30	0.56	3.81	2.54	1.90	1.52	1.27	1.09
		35	0.61	4.15	2.77	2.07	1.66	1.38	1.19
		40	0.68	4.62	3.08	2.31	1.85	1.54	1.32
94-8716	XR11006 -VS Gray	15	0.47	3.20	2.13	1.60	1.28	1.07	0.91
		20	0.52	3.54	2.36	1.77	1.41	1.18	1.01
		25	0.60	4.08	2.72	2.04	1.63	1.36	1.17
		30	0.67	4.56	3.04	2.28	1.82	1.52	1.30
		35	0.73	4.96	3.31	2.48	1.99	1.65	1.42
		40	0.82	5.58	3.72	2.79	2.23	1.86	1.59
94-8717	XR11008 -VS White	15	0.63	4.28	2.86	2.14	1.71	1.43	1.22
		20	0.69	4.69	3.13	2.35	1.88	1.56	1.34
		25	0.80	5.44	3.63	2.72	2.18	1.81	1.55
		30	0.89	6.05	4.03	3.03	2.42	2.02	1.73
		35	0.98	6.66	4.44	3.33	2.67	2.22	1.99
		40	1.10	7.48	4.99	3.74	2.99	2.49	2.14
94-8718	XR11010 -SS Stainless	15	0.79	5.37	3.58	2.69	2.15	1.79	1.53
		20	0.87	5.92	3.94	2.96	2.37	1.97	1.69
		25	1.00	6.80	4.53	3.40	2.72	2.27	1.94
		30	1.12	7.62	5.08	3.81	3.05	2.54	2.18
		35	1.22	8.30	5.53	4.15	3.32	2.77	2.37
		40	1.37	9.32	6.21	4.66	3.73	3.11	2.66
94-8719	XR11015 -SS Stainless	15	1.19	8.09	5.39	4.05	3.24	2.70	2.31
		20	1.30	8.84	5.89	4.42	3.54	2.95	2.53
		25	1.50	10.20	6.80	5.10	4.08	3.40	2.91
		30	1.68	11.42	7.62	5.71	4.57	3.81	3.26
		35	1.84	12.51	8.34	6.26	5.00	4.17	3.57
		40	2.05	13.94	9.29	6.97	5.58	4.65	3.98

*This is the pressure at the nozzle. System pressure may be set higher.

Liters per Hectare Application Rates - Covered Walking Boom

Toro Part Number	Nozzle Number - Color Code	Pressure (Bar)*	Capacity 1 Nozzle (L/min)	Liters per Hectare at 50 Centimeter Spacings						
				Walking Speed						
				1.6 km/h	2.4 km/h	3.2 km/h	4.0 km/h	4.8 km/h	5.6 km/h	
94-8714	XR11004 -VS Red	1.04	1.21	908	606	454	362	301	258	
		1.38	1.32	994	662	497	395	329	282	
		1.73	1.51	1136	757	568	452	376	323	
		2.07	1.70	1277	852	639	508	423	363	
		2.42	1.85	1391	927	695	554	461	395	
		2.76	2.08	1561	1041	781	621	517	444	
94-8715	XR11005 -VS Brown	1.04	1.51	1136	757	568	452	376	323	
		1.38	1.63	1221	814	610	486	404	347	
		1.73	1.89	1419	946	710	565	470	403	
		2.07	2.12	1590	1060	795	633	527	452	
		2.42	2.31	1732	1154	866	689	574	492	
		2.76	2.57	1930	1287	965	768	639	549	
94-8716	XR11006 -VS Gray	1.04	1.78	1334	889	667	531	442	379	
		1.38	1.97	1476	984	738	588	489	420	
		1.73	2.27	1703	1136	852	678	564	484	
		2.07	2.54	1902	1268	951	757	630	541	
		2.42	2.76	2072	1382	1036	825	686	589	
		2.76	3.10	2328	1552	1164	926	771	662	
94-8717	XR11008 -VS White	1.04	2.38	1788	1192	894	712	592	508	
		1.38	2.61	1959	1306	979	780	649	557	
		1.73	3.03	2271	1514	1136	904	752	645	
		2.07	3.37	2526	1684	1263	1006	837	718	
		2.42	3.71	2782	1855	1391	1107	922	791	
		2.76	4.16	3123	2082	1561	1243	1034	887	
94-8718	XR11010 -SS Stainless	1.04	2.99	2243	1495	1121	893	743	637	
		1.38	3.29	2470	1646	1235	983	818	702	
		1.73	3.79	2839	1893	1419	1130	940	807	
		2.07	4.24	3179	2120	1590	1265	1053	904	
		2.42	4.62	3463	2309	1732	1378	1147	984	
		2.76	5.19	3889	2593	1945	1548	1288	1105	
94-8719	XR11015 -SS Stainless	1.04	4.50	3378	2252	1689	1345	1119	960	
		1.38	4.92	3690	2460	1845	1469	1222	1049	
		1.73	5.68	4258	2839	2129	1695	1411	1210	
		2.07	6.36	4769	3179	2385	1898	1580	1355	
		2.42	6.96	5223	3482	2612	2079	1730	1484	
		2.76	7.76	5819	3880	2910	2316	1928	1654	

*This is the pressure at the nozzle. System pressure may be set higher.

Calculating Application Rates

Use the following formulas to verify application rates or to determine new application rates. The formulas are divided by application rate units.

$$\text{US Gallons per Acre} = \frac{(5,940 \times \text{GPM per nozzle})}{(\text{MPH} \times 20^*)}$$

$$\text{US Gallons per 1000 ft}^2 = \frac{(136 \times \text{GPM per nozzle})}{(\text{MPH} \times 20^*)}$$

** Toro nozzle spacing is 20 inches*

$$\text{Speed (MPH)} = \frac{(\text{Distance (ft)} \times 60)}{(\text{Time (seconds)} \times 88)}$$

$$\text{Liters per Hectare} = \frac{(60,000 \times \text{Liters per minute})}{(\text{KmPH} \times 50^*)}$$

** Toro nozzle spacing is 50 centimeters*

$$\text{Speed (KmPH)} = \frac{(\text{Distance (m)} \times 36)}{(\text{Time (seconds)})}$$

Formulas

Unit Definitions and Conversions

Unit	Definition
GPM	US Gallons per minute
L\min	Liters per minute
dL\min	Deciliters per minute
psi	Pounds per square inch
Bar	Bar
GPA	US Gallons per acre
L\ha	Liters per hectare
mL\ha	Milliliters per hectare
Gallons \1000ft ²	US Gallons per 1,000 ft ²
mm	Millimeter
cm	Centimeter
MPH	Miles per hour
km	Kilometer
KmPH	Kilometers per hour

Liquid Conversions

US Gallons x 128 = Fluid Ounces

US Gallons x 3.785 = Liters

US Gallons x 0.83267 = Imperial Gallons

US Gallons x 8.34 = Pounds (Water)

Area Conversions

1 Acre = 43,560 ft²

1 square meter = 10.764 ft²

1 hectare = 2.471 acres or 10,000 square meters

Length Conversions

1 millimeter (mm) = 0.039 inch

1 centimeter (cm) = 0.393 inch

1 meter (m) = 3.281 feet

1 kilometer (km) = 0.621 mile

1 inch = 25.4 millimeters; 2.54 centimeters

1 mile = 1.609 kilometers

Pressure Conversions

1 psi = 0.069 Bar

1 Bar = 14.5 psi

Calculating Nozzle Capacity

Calculating in US Gallons per Acre or US Gallons per 1000 ft²

To calculate the nozzle capacity you need to know the following:

- The recommended application rate for material being used in US gallons per acre or per 1000 square feet.
- The preferred vehicle speed in miles per hour.
- The nozzle spacing along boom (20 inches).

With this information you can calculate the volume per minute (or flow rate) for each nozzle using the following formula.

GPA Example:

$$\text{GPM per nozzle} = \frac{(\text{GPA} \times \text{MPH} \times 20^* \text{ inches})}{5,940}$$

** = nozzle spacing 20 inches*

US Gallons per Acre Formula

Application Rate (AR)= 45 US Gallons per Acre
Vehicle Speed (VS)= 4 MPH
Nozzle Spacing (NS)= 20 inches

$$\frac{(\text{AR} \times \text{VS} \times \text{NS})}{5940} = \frac{(45 \times 4 \times 20)}{5940} = 0.61 \text{ GPM per nozzle}$$

With 0.61 GPM and recommended pressure of 30-50 psi select the gray nozzle with Toro part number 95-9224.

U.S. Gallons per 1000 ft² Example:

$$\text{GPM per nozzle} = \frac{(\text{Gallons per 1000 ft}^2 \times \text{MPH} \times w^*)}{136}$$

** w = nozzle spacing 20 inches*

U.S. Gallons per 1000 ft² Formula

Application Rate (AR)= 1 U.S. Gallons per 1000 ft²
Vehicle Speed (VS)= 4 MPH
Nozzle Spacing (NS)= 20 inches

$$\frac{(\text{AR} \times \text{VS} \times \text{NS})}{136} = \frac{(1 \times 4 \times 20)}{136} = 0.59 \text{ GPM per nozzle}$$

With 0.59 GPM and approximate pressure of 30-50 psi the nozzle with Toro part number 95-9224 would be selected.

Calculating in Liters per Hectare

To calculate the nozzle capacity you need to know the following:

- The recommended application rate in liters per hectare.
- The target vehicle speed in kilometers per hour.
- The nozzle spacing along boom (50 centimeters).

With this information you can calculate the volume per minute (or flow rate) for each nozzle using the following formulas.

L/ha Example:

$$\text{Liters a Minute per nozzle} = \frac{(\text{L per ha} \times \text{KmPH} \times 50^*)}{60,000}$$

** w = nozzle spacing 50 centimeters*

Liters per Hectare Formula

Application Rate (AR)= 910 Liters per Hectare
Vehicle Speed (VS)= 5 KmPH
Nozzle Spacing (NS)= 50 centimeters

$$\frac{(\text{AR} \times \text{VS} \times \text{NS})}{60,000} = \frac{(910 \times 5 \times 50)}{60,000} = 3.79 \text{ Liters a minute per nozzle}$$

Use L/minute and Pressure to select an appropriate nozzle from nozzle selection tables in the following section.

With 3.79 L/minute and recommended pressure of 2.7 Bar the nozzle with Toro part number 95-9188 would be selected.