Spray Considerations and Technology for Effective Pesticide Applications

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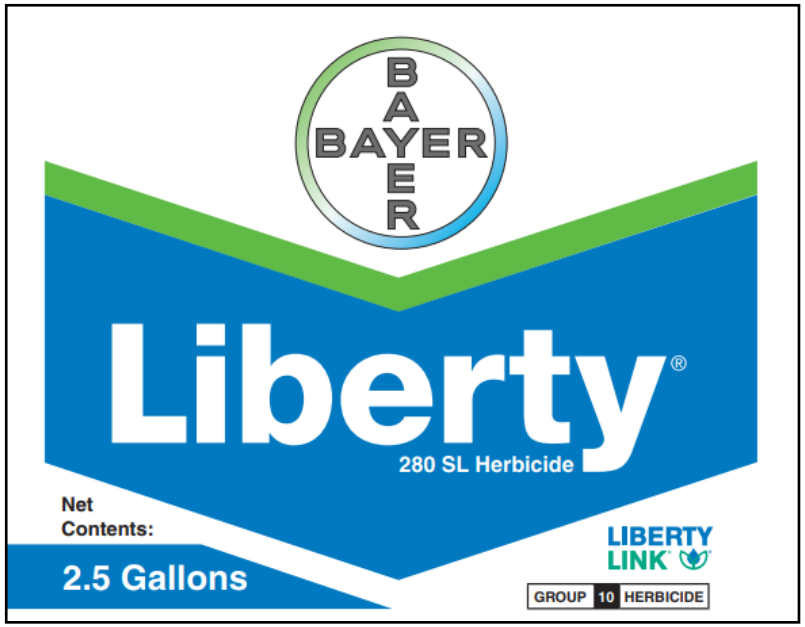
Nozzle Selection:

- Application (Herbicide, Fungicide or Insecticide)
- Mode of Action (Contact or Systemic)
- Check Label
- Application Rate, Speed, Pressure & Spacing

Pesticide Labels:



- Use nozzles and pressure that generate a MEDIUM to COARSE size spray droplet. NOTE: Weed control with very coarse, extremely coarse or ultra-coarse nozzles will not provide adequate coverage and will cause unsatisfactory weed control.
- Apply LIBERTY 280 SL HERBICIDE in a minimum of 15 gallons of water per acre. Increase to 20 gallons of water per acre if dense weed canopy exists.
- Apply at ground speed of less than 15 mph to attain adequate coverage.
- Apply when wind speeds are between 2 mph and 10 mph. DO NOT apply when winds are gusty, or when conditions will favor movement of spray particles off the desired spray target. See the *Spray Drift Management* section of this label for additional information on proper application of LIBERTY 280 SL HERBICIDE.

SPRAY DRIFT MANAGEMENT
Spray Drift Restrictions

Spray drift may result in injury to non-target crops or vegetation. To avoid spray drift, do not apply when wind speed is greater than 10 MPH or during periods of temperature inversions. Do not apply when weather conditions, wind speed, or wind direction may cause spray drift to non-target areas. AVOIDING SPRAY DRIFT AT THE APPLICATION SITE IS THE RESPONSIBILITY OF THE APPLICATOR.

- All aerial and ground application equipment must be properly maintained and calibrated using appropriate carriers.
- For all non-aerial applications, wind speed must be measured adjacent to the application site, on the upwind side, immediately prior to application.

Do not allow herbicide solution to mist, drip, drift or splash onto desirable vegetation because severe injury or destruction to desirable broadleaf plants could result.

The most effective way to reduce drift potential is to apply large droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if the application is made improperly, or under unfavorable environmental conditions (see the "**Temperature and Humidity**" and "**Temperature Inversions**" sections of this label).

9.1.1 Sprayer Setup

The following sprayer setup requirements for drift management must be followed:

- **Nozzle type.** The applicator must use an approved nozzle within a specified pressure range as found at www.xtendimaxapplicationrequirements.com when applying XtendiMax® With VaporGrip® Technology. Do not use any other nozzle and pressure combination not specifically listed on this website.
- **Spray Volume.** The applicator must apply this product in a **minimum of 15 gallons of spray solution per acre**. See Section 8.0 for information on approved tank mix products.
- **Equipment Ground Speed.** Do not exceed a **ground speed of 15 miles per hour**. Select a ground speed that will deliver the desired spray volume while maintaining the desired spray pressure, but slower speeds generally result in better spray coverage and deposition on the target area. Provided the applicator can maintain the required nozzle pressure, it is recommended that tractor speed is reduced to 5 miles per hour at field edges.
- **Spray boom Height.** Do not exceed a **boom height of 24 inches** above target pest or crop canopy. Excessive boom height will increase the drift potential.
- **Wind Speed.** Do not apply when wind speeds are **less than 3 MPH or greater than 10 MPH**. Only apply when wind speed at boom height is between 3 and 10 mph.

9.1.2 Temperature and Humidity

When making applications in low relative humidity or temperatures above 91 degrees Fahrenheit, set up equipment to produce larger droplets to compensate for evaporation (for example: increase orifice size and/or increase spray volume as directed on www.xtendimaxapplicationrequirements.com). Larger droplets have a lower surface to volume ratio and can be impacted less by temperature and humidity. Droplet evaporation is most severe when conditions are both hot and dry.

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Fungicide

Ground Application

DO NOT use less than 5 gallons per acre (gpa) spray volume on sugarcane and 10 gpa spray volume on corn for ground applications. Thorough coverage of foliage is required for optimum disease control. An adjuvant may be used to improve spray coverage. Refer to the adjuvant product label for specific use directions.

Information on Droplet Size

The most effective way to reduce drift potential is to apply large droplets. Use the largest droplet size consistent with acceptable efficacy. Applying larger droplets reduces drift potential but will not prevent drift if applications are made improperly or under unfavorable environmental conditions (see **Wind**; **Temperature and Humidity**; and **Temperature Inversions**).

WILLOWOOD USA

BIFENTHRIN 2EC

Insecticide/Miticide

Droplet size
Use only Medium or coarse spray nozzles (for ground and non-ULV aerial application) according to ASAE (S572) definition for standard nozzles. In conditions of low humidity and high temperatures, applicators should use a coarser droplet size.

Additional Requirements for Ground Application
Wind speed must be measured adjacent to the application site on the upwind side, immediately prior to application.

For ground boom applications, apply using a nozzle height of no more than 4 feet above the ground or crop canopy.

For airblast applications, turn off outward-pointing nozzles at row ends and when spraying the outer two rows. To minimize spray loss over the top in orchard applications, spray must be directed into the canopy.

Nozzle Information

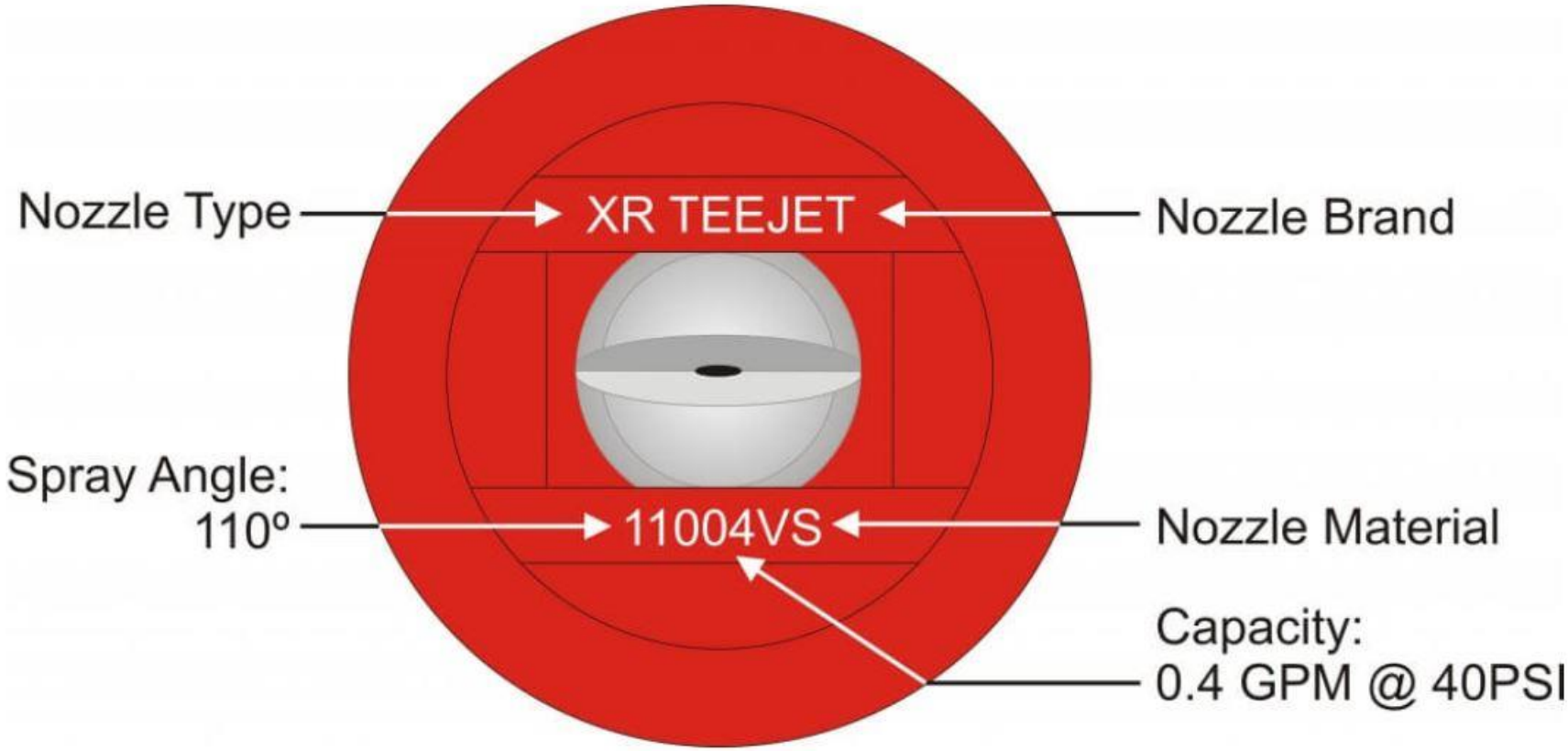


Fig. 1: Typical information printed on modern nozzles.

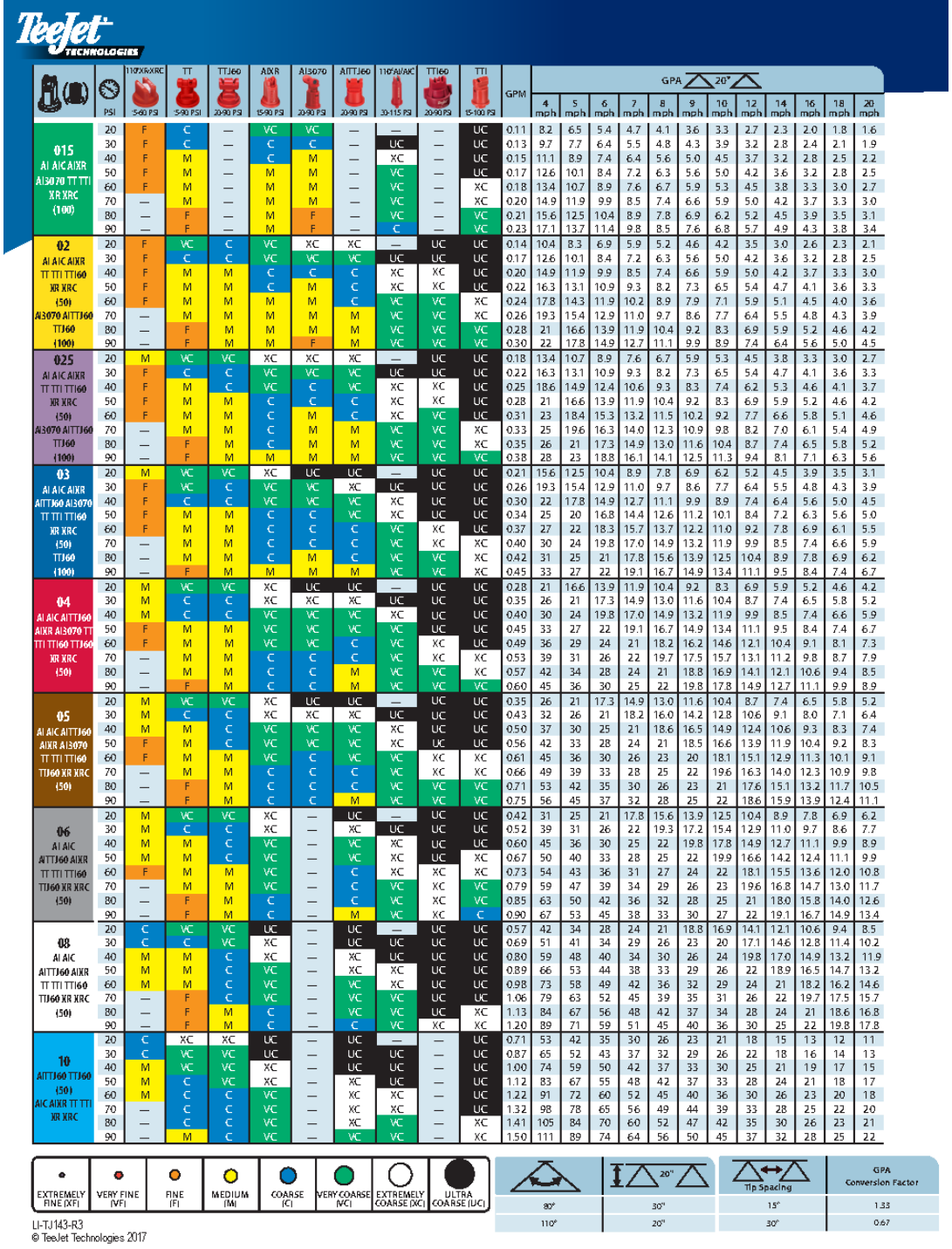
Nozzle color based on tip size (standard)

Tip Size	Colour	Flow Rate	
		US gpm @ 40 psi	L/min @ 3 bar
01	Orange	0.10	0.4
015	Green	0.15	0.6
02	Yellow	0.20	0.8
025	Lilac	0.25	1.0
03	Blue	0.30	1.2
035	Brown Red	0.35	1.4
04	Red	0.40	1.6
05	Brown	0.50	2.0
06	Gray	0.60	2.4
08	White	0.80	3.2

Color Codes for Droplet Size

Category	Symbol	Color Code	Approx. VMD Range (microns)
Extremely Fine	XF	Purple	<60
Very Fine	VF	Red	60-145
Fine	F	Orange	145-225
Medium	M	Yellow	226-325
Coarse	C	Blue	326-400
Very Coarse	VC	Green	401-500
Extremely Coarse	EC	White	501-650
Ultra Coarse	UC	Black	>650

TeeJet
Nozzle selection guide



TeeJet TECHNOLOGIES

	PSI	110°XR/XRC 5-60 PSI	TT 5-90 PSI	TTJ60 20-90 PSI	AIXR 15-90 PSI	AI3070 20-90 PSI	AITTJ60 20-90 PSI	110°AI/AIC 30-115 PSI	TTI60 20-90 PSI	TTI 15-100 PSI	GPM	GPA 20° 4 mph	5 mph	6 mph	7 mph	8 mph	9 mph	10 mph	12 mph	14 mph	16 mph	18 mph	20 mph
015 AI AIC AIXR AI3070 TT TTI XR XRC (100)	20	F	C	—	VC	VC	—	—	—	UC	0.11	8.2	6.5	5.4	4.7	4.1	3.6	3.3	2.7	2.3	2.0	1.8	1.6
	30	F	C	—	C	C	—	UC	—	UC	0.13	9.7	7.7	6.4	5.5	4.8	4.3	3.9	3.2	2.8	2.4	2.1	1.9
	40	F	M	—	C	M	—	XC	—	UC	0.15	11.1	8.9	7.4	6.4	5.6	5.0	4.5	3.7	3.2	2.8	2.5	2.2
	50	F	M	—	M	M	—	VC	—	UC	0.17	12.6	10.1	8.4	7.2	6.3	5.6	5.0	4.2	3.6	3.2	2.8	2.5
	60	F	M	—	M	M	—	VC	—	XC	0.18	13.4	10.7	8.9	7.6	6.7	5.9	5.3	4.5	3.8	3.3	3.0	2.7
	70	—	M	—	M	M	—	VC	—	XC	0.20	14.9	11.9	9.9	8.5	7.4	6.6	5.9	5.0	4.2	3.7	3.3	3.0
	80	—	F	—	M	F	—	VC	—	VC	0.21	15.6	12.5	10.4	8.9	7.8	6.9	6.2	5.2	4.5	3.9	3.5	3.1
	90	—	F	—	M	F	—	C	—	VC	0.23	17.1	13.7	11.4	9.8	8.5	7.6	6.8	5.7	4.9	4.3	3.8	3.4
02 AI AIC AIXR TT TTI TTI60 XR XRC (50) AI3070 AITTJ60 TTJ60 (100)	20	F	VC	C	VC	XC	XC	—	UC	UC	0.14	10.4	8.3	6.9	5.9	5.2	4.6	4.2	3.5	3.0	2.6	2.3	2.1
	30	F	C	C	VC	VC	VC	UC	UC	UC	0.17	12.6	10.1	8.4	7.2	6.3	5.6	5.0	4.2	3.6	3.2	2.8	2.5
	40	F	M	M	C	C	C	XC	XC	UC	0.20	14.9	11.9	9.9	8.5	7.4	6.6	5.9	5.0	4.2	3.7	3.3	3.0
	50	F	M	M	C	M	C	XC	XC	UC	0.22	16.3	13.1	10.9	9.3	8.2	7.3	6.5	5.4	4.7	4.1	3.6	3.3
	60	F	M	M	M	M	C	VC	VC	XC	0.24	17.8	14.3	11.9	10.2	8.9	7.9	7.1	5.9	5.1	4.5	4.0	3.6
	70	—	M	M	M	M	M	VC	VC	XC	0.26	19.3	15.4	12.9	11.0	9.7	8.6	7.7	6.4	5.5	4.8	4.3	3.9
	80	—	F	M	M	M	M	VC	VC	VC	0.28	21	16.6	13.9	11.9	10.4	9.2	8.3	6.9	5.9	5.2	4.6	4.2
	90	—	F	M	M	F	M	VC	VC	VC	0.30	22	17.8	14.9	12.7	11.1	9.9	8.9	7.4	6.4	5.6	5.0	4.5
025 AI AIC AIXR TT TTI TTI60 XR XRC (50) AI3070 AITTJ60 TTJ60 (100)	20	M	VC	VC	XC	XC	XC	—	UC	UC	0.18	13.4	10.7	8.9	7.6	6.7	5.9	5.3	4.5	3.8	3.3	3.0	2.7
	30	F	C	C	VC	VC	VC	UC	UC	UC	0.22	16.3	13.1	10.9	9.3	8.2	7.3	6.5	5.4	4.7	4.1	3.6	3.3
	40	F	M	C	VC	C	VC	XC	XC	UC	0.25	18.6	14.9	12.4	10.6	9.3	8.3	7.4	6.2	5.3	4.6	4.1	3.7
	50	F	M	M	C	C	C	XC	XC	UC	0.28	21	16.6	13.9	11.9	10.4	9.2	8.3	6.9	5.9	5.2	4.6	4.2
	60	F	M	M	C	M	C	XC	VC	UC	0.31	23	18.4	15.3	13.2	11.5	10.2	9.2	7.7	6.6	5.8	5.1	4.6
	70	—	M	M	C	M	M	VC	VC	XC	0.33	25	19.6	16.3	14.0	12.3	10.9	9.8	8.2	7.0	6.1	5.4	4.9
	80	—	F	M	C	M	M	VC	VC	XC	0.35	26	21	17.3	14.9	13.0	11.6	10.4	8.7	7.4	6.5	5.8	5.2
	90	—	F	M	M	M	M	VC	VC	VC	0.38	28	23	18.8	16.1	14.1	12.5	11.3	9.4	8.1	7.1	6.3	5.6
03 AI AIC AIXR AITTJ60 AI3070 TT TTI TTI60 XR XRC (50) TTJ60 (100)	20	M	VC	VC	XC	UC	UC	—	UC	UC	0.21	15.6	12.5	10.4	8.9	7.8	6.9	6.2	5.2	4.5	3.9	3.5	3.1
	30	F	VC	C	VC	VC	XC	UC	UC	UC	0.26	19.3	15.4	12.9	11.0	9.7	8.6	7.7	6.4	5.5	4.8	4.3	3.9
	40	F	C	C	VC	VC	VC	XC	UC	UC	0.30	22	17.8	14.9	12.7	11.1	9.9	8.9	7.4	6.4	5.6	5.0	4.5
	50	F	M	M	C	C	VC	XC	UC	UC	0.34	25	20	16.8	14.4	12.6	11.2	10.1	8.4	7.2	6.3	5.6	5.0
	60	F	M	M	C	C	C	VC	XC	UC	0.37	27	22	18.3	15.7	13.7	12.2	11.0	9.2	7.8	6.9	6.1	5.5
	70	—	M	M	C	C	C	VC	XC	XC	0.40	30	24	19.8	17.0	14.9	13.2	11.9	9.9	8.5	7.4	6.6	5.9
	80	—	M	M	C	M	C	VC	VC	XC	0.42	31	25	21	17.8	15.6	13.9	12.5	10.4	8.9	7.8	6.9	6.2
	90	—	F	M	M	M	M	VC	VC	XC	0.45	33	27	22	19.1	16.7	14.9	13.4	11.1	9.5	8.4	7.4	6.7
04 AI AIC AITTJ60 AIXR AI3070 TT TTI TTI60 TTJ60 XR XRC (50)	20	M	VC	VC	XC	UC	UC	—	UC	UC	0.28	21	16.6	13.9	11.9	10.4	9.2	8.3	6.9	5.9	5.2	4.6	4.2
	30	M	C	C	XC	XC	XC	UC	UC	UC	0.35	26	21	17.3	14.9	13.0	11.6	10.4	8.7	7.4	6.5	5.8	5.2
	40	M	C	C	VC	VC	VC	XC	UC	UC	0.40	30	24	19.8	17.0	14.9	13.2	11.9	9.9	8.5	7.4	6.6	5.9
	50	F	M	M	VC	VC	VC	VC	UC	UC	0.45	33	27	22	19.1	16.7	14.9	13.4	11.1	9.5	8.4	7.4	6.7
	60	F	M	M	VC	VC	C	VC	XC	UC	0.49	36	29	24	21	18.2	16.2	14.6	12.1	10.4	9.1	8.1	7.3
	70	—	M	M	C	C	C	VC	XC	XC	0.53	39	31	26	22	19.7	17.5	15.7	13.1	11.2	9.8	8.7	7.9
	80	—	M	M	C	C	M	VC	VC	XC	0.57	42	34	28	24	21	18.8	16.9	14.1	12.1	10.6	9.4	8.5
	90	—	F	M	C	C	M	VC	VC	VC	0.60	45	36	30	25	22	19.8	17.8	14.9	12.7	11.1	9.9	8.9
05 AI AIC AITTJ60 AIXR AI3070 TT TTI TTI60 TTJ60 XR XRC (50)	20	M	VC	VC	XC	UC	UC	—	UC	UC	0.35	26	21	17.3	14.9	13.0	11.6	10.4	8.7	7.4	6.5	5.8	5.2
	30	M	C	C	XC	XC	XC	UC	UC	UC	0.43	32	26	21	18.2	16.0	14.2	12.8	10.6	9.1	8.0	7.1	6.4
	40	M	M	C	VC	VC	VC	XC	UC	UC	0.50	37	30	25	21	18.6	16.5	14.9	12.4	10.6	9.3	8.3	7.4
	50	F	M	C	VC	VC	VC	XC	UC	UC	0.56	42	33	28	24	21	18.5	16.6	13.9	11.9	10.4	9.2	8.3
	60	F	M	M	VC	C	VC	VC	XC	XC	0.61	45	36	30	26	23	20	18.1	15.1	12.9	11.3	10.1	9.1
	70	—	M	M	C	C	C	VC	XC	XC	0.66	49	39	33	28	25	22	19.6	16.3	14.0	12.3	10.9	9.8
	80	—	F	M	C	C	C	VC	VC	VC	0.71	53	42	35	30	26	23	21	17.6	15.1	13.2	11.7	10.5
	90	—	F	M	C	C	M	VC	VC	VC	0.75	56	45	37	32	28	25	22	18.6	15.9	13.9	12.4	11.1
06 AI AIC AITTJ60 AIXR TT TTI TTI60 TTJ60 XR XRC (50)	20	M	VC	VC	XC	—	UC	—	UC	UC	0.42	31	25	21	17.8	15.6	13.9	12.5	10.4	8.9	7.8	6.9	6.2
	30	M	C	C	XC	—	XC	UC	UC	UC	0.52	39	31	26	22	19.3	17.2	15.4	12.9	11.0	9.7	8.6	7.7
	40	M	M	C	VC	—	VC	XC	UC	UC	0.60	45	36	30	25	22	19.8	17.8	14.9	12.7	11.1	9.9	8.9
	50	M	M	C	VC	—	VC	XC	UC	XC	0.67	50	40	33	28	25	22	19.9	16.6	14.2	12.4	11.1	9.9
	60	F	M	M	VC	—	C	XC	XC	XC	0.73	54	43	36	31	27	24	22	18.1	15.5	13.6	12.0	10.8
	70	—	M	M	VC	—	C	VC	XC	VC	0.79	59	47	39	34	29	26	23	19.6	16.8	14.7	13.0	11.7
	80	—	F	M	C	—	C	VC	XC	VC	0.85	63	50	42	36	32	28	25	21	18.0	15.8	14.0	12.6
	90	—	F	M	C	—	M	VC	XC	C	0.90	67	53	45	38	33	30	27	22	19.1	16.7	14.9	13.4
08 AI AIC AITTJ60 AIXR TT TTI TTI60 TTJ60 XR XRC (50)	20	C	VC	VC	UC	—	UC	—	UC	UC	0.57	42	34	28	24	21	18.8	16.9	14.1	12.1	10.6	9.4	8.5
	30	C	C	VC	XC	—	UC	UC	UC	UC	0.69	51	41	34	29	26	23	20	17.1	14.6	12.8	11.4	10.2
	40	M	M	C	XC	—	XC	UC	UC	UC	0.80	59	48	40	34	30	26	24	19.8	17.0	14.9	13.2	11.9
	50	M	M	C	VC	—	XC	XC	UC	UC	0.89	66	53	44	38	33	29	26	22	18.9	16.5	14.7	13.2
	60	M	M	C	VC	—	VC	XC	UC	UC	0.98	73	58	49	42	36	32	29	24	21	18.2	16.2	14.6
	70	—	F	C	VC	—	VC	VC	UC	UC	1.06	79	63	52	45	39	35	31	26	22	19.7	17.5	15.7
	80	—	F	M	C	—	VC	VC	UC	XC	1.13	84	67	56	48	42	37	34	28	24	21	18.6	16.8
	90	—	F	M	C	—	C	VC	XC	XC	1.20	89	71	59	51	45	40	36	30	25	22	19.8	17.8
10 AITTJ60 TTJ60 (50) AIC AIXR TT TTI XR XRC	20	C	XC	XC	UC	—	UC	—	—	UC	0.71	53	42	35	30	26	23	21	18	15	13	12	11
	30	C	VC	VC	UC	—	UC	UC	—	UC	0.87	65	52	43	37	32	29	26	22	18	16	14	13
	40	M	VC	VC	XC	—	UC	UC	—	UC	1.00	74	59	50	42	37	33	30	25	21	19	17	15
	50	M	C	VC	XC	—	XC	UC	—	UC	1.12	83	67	55	48	42	37	33	28	24	21	18	17
	60	M	C	C	VC	—	XC	XC	—	UC	1.22	91	72	60	52	45	40	36	30	26	23	20	18
	70	—	C	C	VC	—	XC	XC	—	UC	1.32	98	78	65	56	49	44	39	33	28	25	22	20
	80	—	C	C	VC	—	XC	VC	—	XC	1.41	105	84	70	60	52	47	42	35	30	26	23	21
	90	—	M	C	VC	—	VC	VC	—	XC	1.50	111	89	74	64	56	50	45	37	32	28	25	22

EXTREMELY FINE (XF) · VERY FINE (VF) · FINE (F) · MEDIUM (M) · COARSE (C) · VERY COARSE (VC) · EXTREMELY COARSE (XC) · ULTRA COARSE (UC)

	20°	Tip Spacing	GPA Conversion Factor
80°	30"	15"	1.33
110°	20"	30"	0.67

LI-TJ143-R3

TeeJet TECHNOLOGIES

	PSI	110°XR/XRC 15-60 PSI	TT 15-60 PSI	TTJ60 20-90 PSI	AIXR 15-60 PSI	AI3070 20-90 PSI	AITTJ60 20-90 PSI	110°AIXRC 30-115 PSI	TTI60 20-90 PSI	TTI 15-100 PSI	GPM	GPA 20° 4 mph	5 mph	6 mph	7 mph	8 mph	9 mph	10 mph	12 mph	14 mph	16 mph	18 mph	20 mph
02	20	F	VC	C	VC	XC	XC	—	UC	UC	0.14	10.4	8.3	6.9	5.9	5.2	4.6	4.2	3.5	3.0	2.6	2.3	2.1
AI AIC AIXR	30	F	C	C	VC	VC	VC	UC	UC	UC	0.17	12.6	10.1	8.4	7.2	6.3	5.6	5.0	4.2	3.6	3.2	2.8	2.5
TT TTI TTI60	40	F	M	M	C	C	C	XC	XC	UC	0.20	14.9	11.9	9.9	8.5	7.4	6.6	5.9	5.0	4.2	3.7	3.3	3.0
XR XRC	50	F	M	M	C	M	C	XC	XC	UC	0.22	16.3	13.1	10.9	9.3	8.2	7.3	6.5	5.4	4.7	4.1	3.6	3.3
(50)	60	F	M	M	M	M	C	VC	VC	XC	0.24	17.8	14.3	11.9	10.2	8.9	7.9	7.1	5.9	5.1	4.5	4.0	3.6
AI3070 AITTJ60	70	—	M	M	M	M	M	VC	VC	XC	0.26	19.3	15.4	12.9	11.0	9.7	8.6	7.7	6.4	5.5	4.8	4.3	3.9
TTJ60	80	—	F	M	M	M	M	VC	VC	VC	0.28	21	16.6	13.9	11.9	10.4	9.2	8.3	6.9	5.9	5.2	4.6	4.2
(100)	90	—	F	M	M	F	M	VC	VC	VC	0.30	22	17.8	14.9	12.7	11.1	9.9	8.9	7.4	6.4	5.6	5.0	4.5
025	20	M	VC	VC	XC	XC	XC	—	UC	UC	0.18	13.4	10.7	8.9	7.6	6.7	5.9	5.3	4.5	3.8	3.3	3.0	2.7
AI AIC AIXR	30	F	C	C	VC	VC	VC	UC	UC	UC	0.22	16.3	13.1	10.9	9.3	8.2	7.3	6.5	5.4	4.7	4.1	3.6	3.3
TT TTI TTI60	40	F	M	C	VC	C	VC	XC	XC	UC	0.25	18.6	14.9	12.4	10.6	9.3	8.3	7.4	6.2	5.3	4.6	4.1	3.7
XR XRC	50	F	M	M	C	C	C	XC	XC	UC	0.28	21	16.6	13.9	11.9	10.4	9.2	8.3	6.9	5.9	5.2	4.6	4.2
(50)	60	F	M	M	C	M	C	XC	VC	UC	0.31	23	18.4	15.3	13.2	11.5	10.2	9.2	7.7	6.6	5.8	5.1	4.6
AI3070 AITTJ60	70	—	M	M	C	M	M	VC	VC	XC	0.33	25	19.6	16.3	14.0	12.3	10.9	9.8	8.2	7.0	6.1	5.4	4.9
TTJ60	80	—	F	M	C	M	M	VC	VC	XC	0.35	26	21	17.3	14.9	13.0	11.6	10.4	8.7	7.4	6.5	5.8	5.2
(100)	90	—	F	M	M	M	M	VC	VC	VC	0.38	28	23	18.8	16.1	14.1	12.5	11.3	9.4	8.1	7.1	6.3	5.6
03	20	M	VC	VC	XC	UC	UC	—	UC	UC	0.21	15.6	12.5	10.4	8.9	7.8	6.9	6.2	5.2	4.5	3.9	3.5	3.1
AI AIC AIXR	30	F	VC	C	VC	VC	XC	UC	UC	UC	0.26	19.3	15.4	12.9	11.0	9.7	8.6	7.7	6.4	5.5	4.8	4.3	3.9
AITTJ60 AI3070	40	F	C	C	VC	VC	VC	XC	UC	UC	0.30	22	17.8	14.9	12.7	11.1	9.9	8.9	7.4	6.4	5.6	5.0	4.5
TT TTI TTI60	50	F	M	M	C	C	VC	XC	UC	UC	0.34	25	20	16.8	14.4	12.6	11.2	10.1	8.4	7.2	6.3	5.6	5.0
XR XRC	60	F	M	M	C	C	C	VC	XC	UC	0.37	27	22	18.3	15.7	13.7	12.2	11.0	9.2	7.8	6.9	6.1	5.5
(50)	70	—	M	M	C	C	C	VC	XC	XC	0.40	30	24	19.8	17.0	14.9	13.2	11.9	9.9	8.5	7.4	6.6	5.9
TTJ60	80	—	M	M	C	M	C	VC	VC	XC	0.42	31	25	21	17.8	15.6	13.9	12.5	10.4	8.9	7.8	6.9	6.2
(100)	90	—	F	M	M	M	M	VC	VC	XC	0.45	33	27	22	19.1	16.7	14.9	13.4	11.1	9.5	8.4	7.4	6.7
04	20	M	VC	VC	XC	UC	UC	—	UC	UC	0.28	21	16.6	13.9	11.9	10.4	9.2	8.3	6.9	5.9	5.2	4.6	4.2
AI AIC AITTJ60	30	M	C	C	XC	XC	XC	UC	UC	UC	0.35	26	21	17.3	14.9	13.0	11.6	10.4	8.7	7.4	6.5	5.8	5.2
AIXR AI3070 TT	40	M	C	C	VC	VC	VC	XC	UC	UC	0.40	30	24	19.8	17.0	14.9	13.2	11.9	9.9	8.5	7.4	6.6	5.9
TTI TTI60 TTJ60	50	F	M	M	VC	VC	VC	VC	UC	UC	0.45	33	27	22	19.1	16.7	14.9	13.4	11.1	9.5	8.4	7.4	6.7
XR XRC	60	F	M	M	VC	VC	C	VC	XC	UC	0.49	36	29	24	21	18.2	16.2	14.6	12.1	10.4	9.1	8.1	7.3
(50)	70	—	M	M	C	C	C	VC	XC	XC	0.53	39	31	26	22	19.7	17.5	15.7	13.1	11.2	9.8	8.7	7.9
	80	—	M	M	C	C	M	VC	VC	XC	0.57	42	34	28	24	21	18.8	16.9	14.1	12.1	10.6	9.4	8.5
	90	—	F	M	C	C	M	VC	VC	VC	0.60	45	36	30	25	22	19.8	17.8	14.9	12.7	11.1	9.9	8.9

EXTREMELY FINE (XF)	VERY FINE (VF)	FINE (F)	MEDIUM (M)	COARSE (C)	VERY COARSE (VC)	EXTREMELY COARSE (XC)	ULTRA COARSE (UC)

	20°	Tip Spacing	GPA Conversion Factor
80°	30°	15°	1.33
110°	20°	30°	0.67

LI-TJ143-R3

Nozzle size	Pressure (psi)	Flow rate (US gpm)	Numbers in Table Body are mph, nozzle spacing = 20 in												
			3 gpa	4 gpa	5 gpa	6 gpa	7 gpa	8 gpa	9 gpa	10 gpa	12 gpa	14 gpa	16 gpa	18 gpa	20 gpa
0.2 Yellow	20	0.14	14.0	10.5	8.4	7.0	6.0	5.3	4.7	4.2	3.5	3.0	2.6	2.3	2.1
	30	0.17	17.1	12.9	10.3	8.6	7.3	6.4	5.7	5.1	4.3	3.7	3.2	2.9	2.6
	40	0.20	19.8	14.9	11.9	9.9	8.5	7.4	6.6	5.9	5.0	4.2	3.7	3.3	3.0
	50	0.22	22.1	16.6	13.3	11.1	9.5	8.3	7.4	6.6	5.5	4.7	4.2	3.7	3.3
	60	0.24	24.2	18.2	14.5	12.1	10.4	9.1	8.1	7.3	6.1	5.2	4.5	4.0	3.6
	70	0.26	26.2	19.6	15.7	13.1	11.2	9.8	8.7	7.9	6.5	5.6	4.9	4.4	3.9
	80	0.28	28.0	21.0	16.8	14.0	12.0	10.5	9.3	8.4	7.0	6.0	5.3	4.7	4.2
	90	0.30	29.7	22.3	17.8	14.9	**12.7**	11.1	9.9	8.9	7.4	6.4	5.6	5.0	4.5
0.25 Lilac	20	0.18	17.5	13.1	10.5	8.8	7.5	6.6	5.8	5.3	4.4	3.8	3.3	2.9	2.6
	30	0.22	21.4	16.1	12.9	10.7	9.2	8.0	7.1	6.4	5.4	4.6	4.0	3.6	3.2
	40	0.25	24.8	18.6	14.9	12.4	10.6	9.3	8.3	7.4	6.2	5.3	4.6	4.1	3.7
	50	0.28	27.7	20.8	16.6	13.8	11.9	10.4	9.2	8.3	6.9	5.9	5.2	4.6	4.2
	60	0.31	30.3	22.7	18.2	15.2	**13.0**	11.4	10.1	9.1	7.6	6.5	5.7	5.1	4.5
	70	0.33	32.7	24.6	19.6	16.4	14.0	12.3	10.9	9.8	8.2	7.0	6.1	5.5	4.9
	80	0.35	35.0	26.3	21.0	17.5	15.0	13.1	11.7	10.5	8.8	7.5	6.6	5.8	5.3
	90	0.38	37.1	27.8	22.3	18.6	15.9	13.9	12.4	11.1	9.3	8.0	7.0	6.2	5.6
0.3 Blue	20	0.21	21.0	15.8	12.6	10.5	9.0	7.9	7.0	6.3	5.3	4.5	3.9	3.5	3.2
	30	0.26	25.7	19.3	15.4	12.9	11.0	9.6	8.6	7.7	6.4	5.5	4.8	4.3	3.9
	40	0.30	29.7	22.3	17.8	14.9	**12.7**	11.1	9.9	8.9	7.4	6.4	5.6	5.0	4.5
	50	0.34	33.2	24.9	19.9	16.6	14.2	12.5	11.1	10.0	8.3	7.1	6.2	5.5	5.0
	60	0.37	36.4	27.3	21.8	18.2	15.6	13.6	12.1	10.9	9.1	7.8	6.8	6.1	5.5
	70	0.40	39.3	29.5	23.6	19.6	16.8	14.7	13.1	11.8	9.8	8.4	7.4	6.5	5.9
	80	0.42	42.0	31.5	25.2	21.0	18.0	15.8	14.0	12.6	10.5	9.0	7.9	7.0	6.3
	90	0.45	44.6	33.4	26.7	22.3	19.1	16.7	14.9	13.4	11.1	9.5	8.4	7.4	6.7
0.35 Brown Red	20	0.25	24.5	18.4	14.7	12.3	10.5	9.2	8.2	7.4	6.1	5.3	4.6	4.1	3.7
	30	0.30	30.0	22.5	18.0	15.0	**12.9**	11.3	10.0	9.0	7.5	6.4	5.6	5.0	4.5
	40	0.35	34.7	26.0	20.8	17.3	14.9	13.0	11.6	10.4	8.7	7.4	6.5	5.8	5.2
	50	0.39	38.7	29.1	23.2	19.4	16.6	14.5	12.9	11.6	9.7	8.3	7.3	6.5	5.8
	60	0.43	42.4	31.8	25.5	21.2	18.2	15.9	14.1	12.7	10.6	9.1	8.0	7.1	6.4
	70	0.46	45.8	34.4	27.5	22.9	19.6	17.2	15.3	13.8	11.5	9.8	8.6	7.6	6.9
	80	0.49	49.0	36.8	29.4	24.5	21.0	18.4	16.3	14.7	12.3	10.5	9.2	8.2	7.4
	90	0.53	52.0	39.0	31.2	26.0	22.3	19.5	17.3	15.6	13.0	11.1	9.7	8.7	7.8
0.4 Flame Red	20	0.28	28.0	21.0	16.8	14.0	**12.0**	10.5	9.3	8.4	7.0	6.0	5.3	4.7	4.2
	30	0.35	34.3	25.7	20.6	17.1	**14.7**	12.9	11.4	10.3	8.6	7.3	6.4	5.7	5.1
	40	0.40	39.6	29.7	23.8	19.8	17.0	14.9	13.2	11.9	9.9	8.5	7.4	6.6	5.9
	50	0.45	44.3	33.2	26.6	22.1	19.0	16.6	14.8	13.3	11.1	9.5	8.3	7.4	6.6
	60	0.49	48.5	36.4	29.1	24.2	20.8	18.2	16.2	14.5	12.1	10.4	9.1	8.1	7.3
	70	0.53	52.4	39.3	31.4	26.2	22.5	19.6	17.5	15.7	13.1	11.2	9.8	8.7	7.9
	80	0.57	56.0	42.0	33.6	28.0	24.0	21.0	18.7	16.8	14.0	12.0	10.5	9.3	8.4
	90	0.60	59.4	44.6	35.6	29.7	25.5	22.3	19.8	17.8	14.9	12.7	11.1	9.9	8.9

Fig 6: Five solutions for the question, "which nozzle to apply 7 gpa at 13 mph?"

Sprayer Calibration Method

Ounce or $1/128^{th}$ acre method

Nozzle Spacing (in)	Distance (ft)
12	340
14	292
16	255
18	227
20	204
24	170

128^{th} acre = 340 ft^2

1 gallon = 128 ounces

Record the time (seconds) to travel the corresponding distance & collect the spray output for the same time from each nozzle

Liquid collected in ounces = rate in gallons per acre

Application Rate Calculations:

$$\text{Application Rate } (GPA) = \frac{Nozzle\ flow\ Rate\ (GPM) \times 5940}{Speed\ (mph)\ \times Swath\ (inches)}$$

$$Rate\ (GPM) = \frac{Application\ rate\ (GPA) \times Speed\ (mph)\ \times Swath\ (in.)}{5940}$$

Boom Sprayer:

$$\text{Distance to travel} = \frac{340\ \times 12}{Nozzle\ Spacing\ (inches)}$$

A useful tool for checking nozzle flow rate

SpotOn® BY Innoquest

SpotOn® SC-1 Sprayer Calibrator

Availability: In Stock **Stock Number:** 14005

Price: $154.95

Quantity: 1 Add To Cart

Add To My Equipment List

https://innoquestinc.com/product/spoton-sprayer-calibrator-model-sc-1/

https://www.amazon.com/Spot-On-SpotOn-Sprayer-Calibrator/dp/B00JRD6UA0

Water Sensitive Paper for assessing spray coverage

https://gemplers.com/products/teejet-water-sensitive-spray-cards

https://www.sprayerdepot.com/products/3-x-2-water-sensitive-paper

Good

Acceptable

Not Enough

Smartphone Apps for nozzle selection, calibration and coverage assessment:

A few worth investigating include:

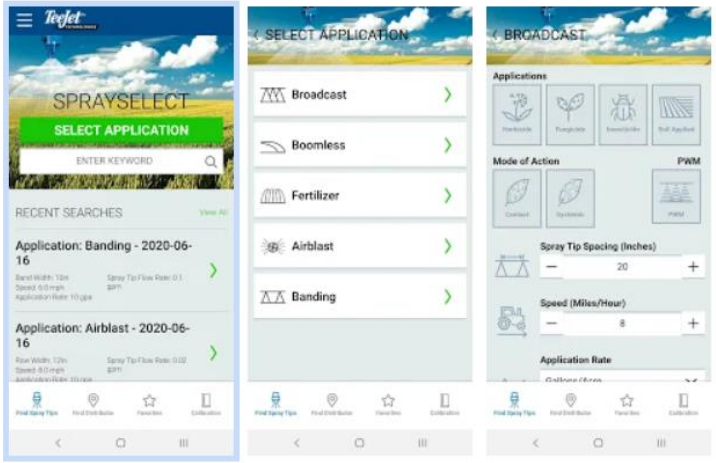
- **TeeJet Spray Select** – provides recommended nozzle and operating pressure based on ground speed, tip spacing, target rate & droplet size requirements
- **Ground Spray** – provides droplet size data for a wide range of spray tips spraying water or active ingredient
- **Mix Tank** – provides the proper sequence for adding various active ingredients into tank mixes
- **Calibrate My Sprayer** – used to assist in calibrating sprayers when doing a volume collection test.

SpraySelect

TeeJet Technologies Co. Business

Everyone

This app is compatible with all of your devices.



Tip Wizard Spray Tip & Flow Indicator Selector

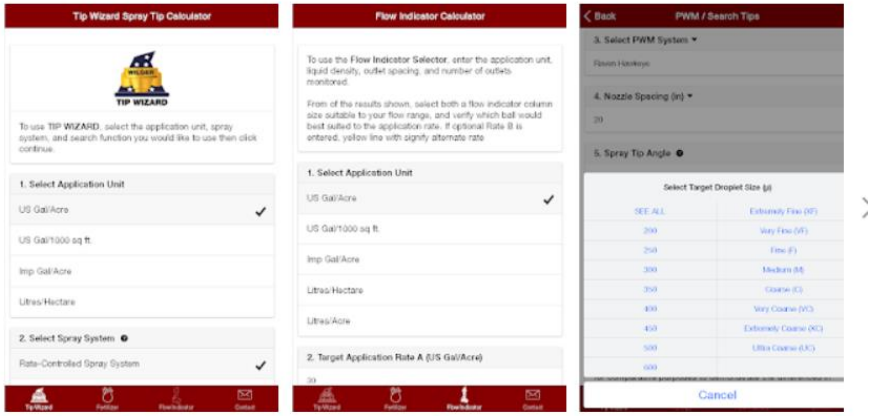
Wilger Tools

★★★★☆ 8

Everyone

This app is compatible with all of your devices.

Installed



Calibrate My Sprayer

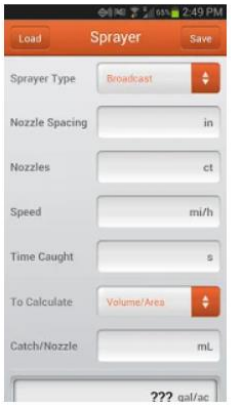
Clemson University Tools

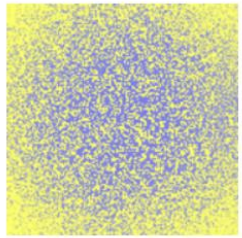
★★★★½ 33

Everyone

This app is compatible with all of your devices.

Installed





SnapCard

Department of Agriculture and Food WA Tools

★★★★½ 30

Everyone

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