

## SELECT THE DROPLET SIZE

According to the criteria of the BCPC (British Crop Protection Council) in conjunction with the ASAE (American Society for Agricultural Engineers) the nozzles are classified into 6 categories according to the spectrum of droplets produced and the spray drift risk. It is a classification made according to droplet size. This table is a guide to complement the phytosanitary instructions to be used.

Volume median diameter*** VMD (µm)	ASAE S572 BCPC	Fungicide		Insecticide		Herbicide			Liquid fertilizer	
		Contact	Systemic	Contact	Systemic	Pre-emergence	Contact	Systemic	Soil	Foliar
100	VF (very fine)	√*		√*						
175	F (fine)	√		√			√*			√*
250	M (medium)	√	√	√	√	√	√	√		√
375	C (coarse)		√**		√**	√	√**	√	√	√
450	VC (very coarse)					√		√**		
	EC (extra. coarse)								√	√

√ The best option.  
 √\* Limited to optimum weather conditions (wind, temperature) and use of hoods (herbicides).  
 √\*\* For adverse wind conditions (in these cases increase the spray volume to compensate the coverage).

\*\*\* Droplet size classification based on the BCPC specifications and in accordance with the ASAE S-572 Standard. Measurements according to the Malvern Spraytec particle size measuring device. Classification subject to change.

## SELECT THE NOZZLE DEPENDING ON USE

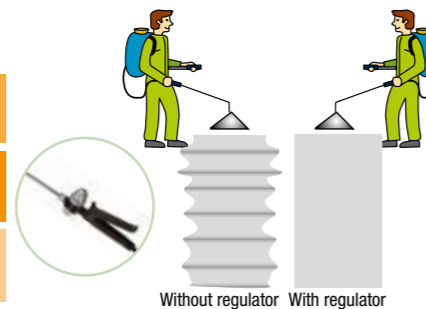
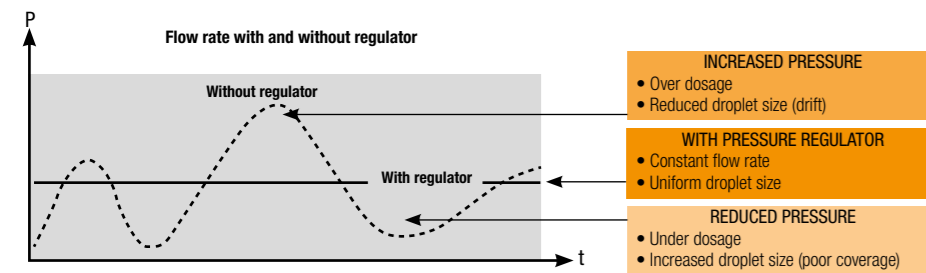
Most suitable nozzle types and spray patterns depending on the application.

	Fungicide	Insecticide	Herbicide	Liquid fertilizer		
				Soil	Foliar	
Even fan nozzle - FE	Excellent	Good	Excellent	Good	*Good	*Good
Low drift fan - LD	Good	Excellent	Good	Excellent	Excellent	Very good
Deflective - D	Good	Very good	Good	Very good	Excellent	Very good
Hollow cone - HC	Excellent	Good	Excellent	Good	Good	Very good
Air induced - AI		Very good		Very good	Excellent	Excellent
Special - Esp.	Excellent	Good	Excellent	Good		Excellent

\* Low pressure.

## SELECT THE OPERATING PRESSURE

In the control of the droplet size and therefore on the efficiency of the application, it is essential to maintain constant spraying conditions. Every Goizper S. Coop. knapsack sprayer comes with a standard pressure regulator that allows to maintain constant operating pressure from 1.5 bar (20 psi) and 3 bar (40 psi). This accessory together with suitable nozzles ensures success in the application of herbicides, insecticides, fungicides and foliar fertilizers. The use of a pressure regulator in addition to ensuring uniformity in the treatments significantly reduces the consumption of water/ agro-chemicals, as well as the pumping frequency and the drift risk, especially in herbicide treatments.



## Strong international presence

14 own branch offices on 5 continents, together with a wide network of distributors; which enables us to meet the specific needs of customers in over 100 countries.



## R+D+i

Goizper has its own Technological Centre of Research, Development and Innovation from where value is generated providing solutions and product improvements.

The right combination of the pressure regulator, nozzles and accessories, offer to the market solutions adapted to the needs of each crop, such as cotton, coffee, cocoa, etc.

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# Goizper Spraying

YOUR PARTNER FOR ACCURATE SPRAYING



## A guide

to make the most of your spraying



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# Optimise your spraying: with a new range of nozzles and pressure regulator by GOIZPER

## PRESENTATION

Goizper, world leader manufacturer of manual sprayers, has designed a complete range of nozzles to comply with:

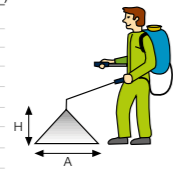
- The ISO international colour coding standards according to flow rate.
- British code standards.
- Standard ISO compatible measures for use in other equipment.

### Technical parameters

Swath width for different spray angles and heights.

WIDTH (cm)	A			
∠ H	30 cm	40 cm	50 cm	60 cm
80°	50,4	67,1	83,9	101
90°	60,0	80,0	100	120
110°	85,7	114	143	171
130°	129	172	215	257
145°	190	253	320	380

NOZZLE IDENTIFICATION	
COLOUR	FLOW RATE (L/min 3 bar)
Orange	0,4
Green	0,6
Yellow	0,8
Blue	1,2
Red	1,6
Brown	2,0
White	2,4
Black	3,2



ISO 10625 colour code assigns a colour to each flow rate.

Flow rate vs. Pressure variation

$$Q_2 = Q_1 \sqrt{P_2/P_1}$$

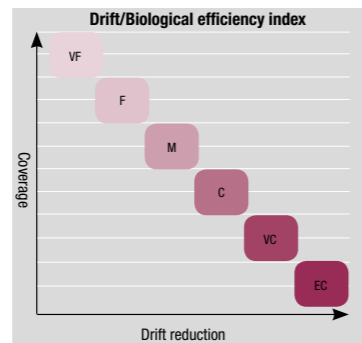
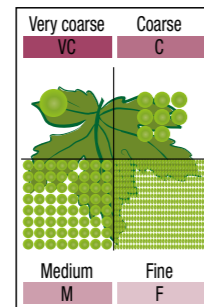
Volume application rate

$$L/Ha = \frac{\text{Flow rate (L/min)} \times 600}{\text{Width (m)} \times \text{speed (Km/h)}}$$

1 m/sec. = 3.6 Km/h

## NOZZLE SELECTION GUIDE

The selection of a nozzle is essential for the accuracy in the agro-chemical treatment. The biological efficiency of a treatment will depend to a great extent on the coverage and droplet size obtained by the nozzle. For this reason it is recommended to increase the number of hits on the target with the suitable droplets under optimum working conditions. On the other hand, when the working conditions are not suitable (e.g. strong wind, heat) the number of hits on the target are drastically reduced due to the drift or evaporation of the droplets. It is not desirable to apply treatments under these conditions.

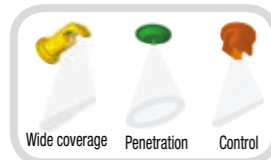


### 1. Select the suitable droplet size

- Always follow the instructions on the agro-chemical label.
- Check this catalogue for reference purpose

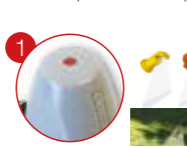
### 2. Select the nozzle according to:

- Spray pattern (Follow the instructions on the agro-chemical product label).
- Spray volume (Follow the instructions on the agro-chemical product label).
- Spraying speed.

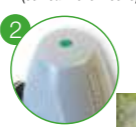


### 3. Select the working pressure: Use the pressure regulator

1.5 bar function: Herbicide (deflective-even fan)



3 bar function: Insecticide-fungicide (conical-hollow cone)



Free flow or depressurising



- To minimise the effect of wind drift, use low pressures with the regulator at 1.5 bar position.

### 4. Verify spray pattern or trace and flow rate

## Fan nozzle

Available in two angles, 80° and 110°. Gives uniform distribution. **Mainly for post emergence selective herbicide application that requires a good coverage.** Do not use with non-selective herbicides unless a protection hood is used to avoid the possible drift risk. Although usually used at low pressure, 3 bar pressure is also a common choice for many fungicides and insecticides applications.

COLOUR	REFERENCE	DESCRIPTION	ANGLE	L/min		L/Ha		Droplet size	
				1.5 bar	3 bar	1.5 bar	3 bar	1.5 bar	3 bar
Orange	8.34.44.301	FE 80/0.4/3	80	0,28	0,4	56	79	F	F
Green	8.34.44.302	FE 80/0.6/3	80	0,43	0,6	85	119	F	F
Yellow	8.34.44.303	FE 80/0.8/3	80	0,56	0,8	111	159	M	F
Blue	8.34.44.304	FE 80/1,2/3	80	0,86	1,2	171	238	M	M
Blue	8.34.44.314	FE 110/1,2/3	110	0,86	1,2	100	140	M	F
White	8.34.44.318	FE 110/3,2/3	110	2,27	3,2	265	373	C	C

\*Speed 1m/seg. 50 cm height

## Low drift fan nozzle

Nozzles **designed to reduce drift** with a good coverage both at 1.5 as well as 3 bar. **Especially recommended for pre-emergence and post-emergence systemic treatments.** It is also a very suitable nozzle for systemic fungicide and insecticide applications where medium droplet sizes are sought.

COLOUR	REFERENCE	DESCRIPTION	ANGLE	L/min		L/Ha		Droplet size	
				1.5 bar	3 bar	1.5 bar	3 bar	1.5 bar	3 bar
Orange	8.34.43.601	LD 80/0.4/3	80	0,28	0,4	56	79	M	M
Green	8.34.43.602	LD 80/0.6/3	80	0,43	0,6	85	119	C	M
Yellow	8.34.43.603	LD 80/0.8/3	80	0,56	0,8	111	159	C	M

## Deflective nozzles

Wide opening angle nozzles, designed for **generally pre-emergence herbicide application** usually where a larger droplet size spraying is required. Nozzles with greater flow rates (larger orifice sizes) and lower pressures produce larger droplets thus reducing drift risk. It is recommended to apply at low pressures (1.5 bar).

COLOUR	REFERENCE	DESCRIPTION	ANGLE	L/min		L/Ha		Droplet size	
				1.5 bar	3 bar	1.5 bar	3 bar	1.5 bar	3 bar
Black	8.34.45.363	D/0.44/1	145	0,49		26		F	
Yellow	8.34.45.303	D/0.46/1	110-120	0,56		65		M	
Red	8.34.45.305	D/0.92/1	110-120	1,13		132		M	
Brown	8.34.45.306	D/1,15/1	110-120	1,41		164		C	
White	8.34.45.308	D/1,84/1	110-120	2,26		263		C	
Purple	8.34.45.353	D/2,4/1	130	2,95		229		C	

\*Speed 1m/seg. 50 cm height

## Hollow cone nozzles

Hollow cone spray nozzles. Recommended for **broadcast coverage spraying of fungicides and insecticides on several crops that require canopy-ear targeting with fine droplets.** Recommended working pressure is 3 bar. Less likely to block than flat fan nozzles.

COLOUR	REFERENCE	DESCRIPTION	ANGLE	REF.	L/min		L/Ha		Droplet size	
					1.5 bar	3 bar	1.5 bar	3 bar	1.5 bar	3 bar
Black	8.34.42.309.1	HC 80/0.2/3	80	8.34.42.309.2	0,13	0,2	26	40	F	VF
Orange	8.34.42.301.1	HC 80/0.4/3	80	8.34.42.301.2	0,28	0,4	56	79	F	F
Green	8.34.42.302.1	HC 80/0.6/3	80	8.34.42.302.2	0,43	0,6	85	119	F	F
Yellow	8.34.42.303.1	HC 80/0.8/3	80	8.34.42.303.2	0,56	0,8	111	159	M	F
Blue	8.34.42.304.1	HC 80/1.2/3	80	8.34.42.304.2	0,86	1,2	171	238	M	F
Red	8.34.42.305.1	HC 80/1.6/3	80	8.34.42.305.2	1,13	1,6	225	318	M	F

\*Speed 1m/seg. 50 cm height

## Air induced (foam) nozzles

Designed for application of **non selective herbicides (e.g. Glyphosate) when larger size droplets are required to reduce the drift risk.** This nozzle produces very large droplets due to the Venturi effect by injecting air within the droplets. Recommended working pressure is 3 bar to ensure the size and uniformity of the droplets.

To Even Fan	COLOUR	REFERENCE	DESCRIPTION	ANGLE	L/min		L/Ha		Droplet size	
					1.5 bar	3 bar	1.5 bar	3 bar	1.5 bar	3 bar
	Yellow	8.34.46.814	AI 80/0,8/3	80	0,56	0,8	111	159	EC	VC
	Blue	8.34.46.813	AI 80/1,2/3	80	0,86	1,2	171	238	EC	VC

To Even Deflective	COLOUR	REFERENCE	DESCRIPTION	ANGLE	L/min		L/Ha		Droplet size	
					1.5 bar	3 bar	1.5 bar	3 bar	1.5 bar	3 bar
	Yellow	8.34.46.804	AID 110/0,8/3	110-120	0,56	0,8	65	93	EC	VC
	Blue	8.34.46.803	AID 110/1,2/3	110-120	0,86	1,2	100	140	EC	VC

\*Speed 1m/seg. 50 cm height

## Special nozzles

Overlapped hollow cone spray nozzles. The hollow cones are overlapped creating a full cone. **Recommended for broadcast coverage spraying of fungicides and insecticides on several crops** that require small droplets. Recommended working pressure is 3 bar.

NOZZLE	REFERENCE	ANGLE	L/min		L/Ha		Droplet size	
			1.5 bar	3 bar	1.5 bar	3 bar	1.5 bar	3 bar
Double adjustable	8.34.46.802	100	0,63	0,9	88	126		
4 holes	8.34.46.801	80	0,7	1	139	199	F	F

\*Speed 1m/seg. 50 cm height