

The COMBO-JET® Spray Nozzle Advantage

Less plugging, as the path of flow always gets larger

40% longer strainer that snaps & seals into place

SR / MR / DR / UR
50% 75% 90% 90%+
Drift Reduction Series

Cap color matched to flow rate

Super long-lasting stainless steel spray tip

The most versatile spray tips for Pulse Width Modulation Systems (e.g. Capstan Pinpoint®/EVO®, Case AIM Command®, John Deere ExactApply®, IntelliSpray®, Raven Hawkeye®, & more)

Spray tip & cap are held together as one piece

Easy-to-read label
(MR110-06 = IMR Series, 110° tip, 0.6 US GPM flow rate)

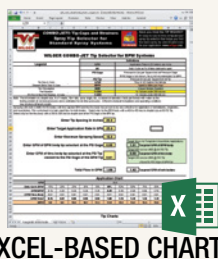
Best educational spray tip charts & tools provided to select the best spray tips

Combo-Jet tips use a modern pre-orifice & closed chamber design that produces significantly less drift, creates solid mass droplets, for maximum spray velocity and more meaningful spray.

Without needing consistent air induction for drift reduction,
Combo-Jet spray tips set the standard for Pulse Width Modulation (PWM) spraying system nozzles.

*Capstan EVO®, Capstan Pinpoint®, Case AIM Command®, John Deere ExactApply®, IntelliSpray®, Raven Hawkeye®, AgriTac StrictSpray Plus™ are not affiliated or owned by Wilger. They remain property of their respective owner(s).

WILGER.NET has the most useful spray tip selection help in the world.



COMBO-JET® ER/SR/MR/DR/UR Spray Tips - What is the difference?

The **sliding scale of droplet size** means at any flow rate, you can match your desired spray quality.

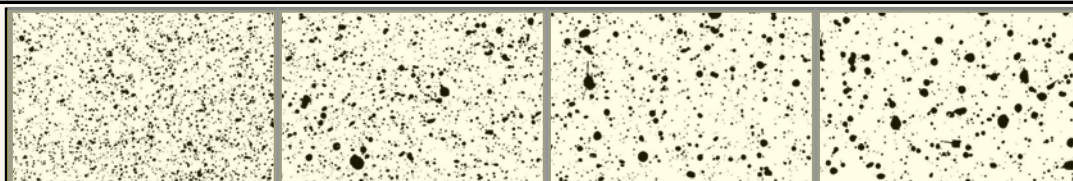


Comparison Criteria	ER Series Extended Range	SR Series Small Reduction	MR Series Mid-Range Reduction	DR Series Drift Reduction	UR Series Drift Reduction
Spray Tip Design	Conventional Flat Fan	Pre-orifice Drift Reduction	Pre-orifice Drift Reduction	Pre-orifice Drift Reduction	Dual Chamber Drift Red.
Spray Quality @40PSI	Medium	Coarse	Extremely Coarse	Extremely Coarse	Ultra-Coarse
Droplet Size ¹ @40PSI	Smallest (246µ VMD ¹)	Medium (371µ VMD ¹)	Large (474µ VMD ¹)	Very Large (529µ VMD ¹)	Ultra Coarse (633µ VMD ¹)
% <141µ ² % <600µ ³	20% of volume < 141µ 94% of volume <600µ	8% of volume < 141µ 89% of volume <600µ	4% of volume < 141µ 74% of volume <600µ	2% of volume < 141µ 64% of volume <600µ	UR spray tips are specialty spray tips, designed for certain chemical applications that require exceptional drift reduction. They are not to be replaced with other spray tip series that are not approved to be on the chemical label. Always follow up-to-date label information.
Drift Potential	Most likely to drift	Lower drift potential	Major reduction in drift	Very low drift potential	Refer to chemical application label for maximum pressures, speeds and application information.
Coverage	Best	Excellent	Very good	Good	More information available at www.wilger.net

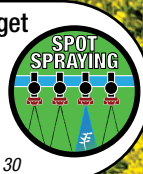
¹Based on an XX110-06 nozzle @ 40 psi (2.75 BAR)

²Droplets smaller than 141µ are more likely to drift. 141µ is used as a standard for estimating driftable fines.

³Droplets smaller than 600µ provide better coverage. Droplets > 600µ consume more spray volume, reducing overall coverage.



Don't Forget
the ER &
DX series
for spot
spraying



More on Page 30

Selecting the Correct Spray Quality & Droplet Size

Drift vs. Efficacy

Generally speaking, smaller droplets deposit on the target more effectively than larger droplets, but larger droplets will drift less. So, when balancing drift control and efficacy, ensure to follow chemical labels and guidelines to designate the required spray quality and droplet size.

Where to find target spray quality or droplet size?

Depending on the chemical, as well as the different methods and modes of applications, some chemical labels may have less/more information. In general, chemical labels will have a description of how it should be applied, in the form of an ASABE spray classification recommendation, or a minimum spray classification (e.g. Spray at least ASABE Coarse). Some chemical label will also stipulate which nozzles can be used.

Application Information:

• Water Volume: Minimum 22 L per acre.

Minimum volume requirement on chemical label

Reference max pressure for conventional nozzles like ER series.

• Nozzles and Pressure: 30 to 40 psi (210 to 275 kPa) when using conventional flat fan nozzles.

Try avoid conventional (non-drift reduction) spray tips.

Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of **ASABE coarse spray**.

Droplet spectrum recommendation for balance of drift & coverage.

Example Spray Quality Chart by Type of Application

ASABE S-572.1 Classification Category	Color Code	Estimated VMD Range for Spray Quality*	Contact Insecticide & Fungicide	Systemic Insecticide & Fungicide	Contact Foliar Herbicide	Systemic Foliar Herbicide	Soil-Applied Herbicide	Incorporated Soil-Applied Herbicide	Fertilizer
Extremely Fine (XF)	Purple	Under 60							
Very Fine (VF)	Red	60-105							
Fine (F)	Orange	106-235							
Medium (M)	Yellow	236-340							
Coarse (C)	Blue	341-403							
Very Coarse (VC)	Green	404-502							
Extremely Coarse (XC)	White	503-665							
Ultra Coarse (UC)	Black	Over 665							

The above table provides general guidelines regarding droplet size and spray quality used in most spray applications.

It is always required that you carefully read and follow updated chemical manufacturers application label and instructions.

*NOTE: VMD range does not classify spray quality. Always ensure spray quality is followed first. VMD is a supplementary figure, and it is normal that nozzles with similar VMD can be classified into different spray qualities.

What about Multi-Tip Spraying? When to consider Double-Down & Angled Spraying

Potential problems with HIGH FLOW applications (140L/Ha+) with a single spray nozzle:

Spraying high volume out of a single tip can produce droplets that are “too large” to be effective for coverage, which make for less effective spray application.

Using multiple spray tips at the same time can provide substantial gains in effective coverage into crops or applications that otherwise would be very difficult to cover; **however**, multi-tip spraying should not be used without reason.

A typical time to use **Multi-Angle spraying**:

For improved coverage on a vertical growing target (e.g. wheat) when you are needing to paint both sides of the plant with fungicide.
(e.g. Fusarium Head Blight)



A typical time to use **Double-Down spraying**:

For high rate applications that rely on consistent coverage in a dense canopy. Use nozzles to produce a meaningful mix of coarser and finer spray to hit different levels of the canopy.



Pairing already-owned nozzles to make a dual nozzle pair:

Much of the time, an operator already has 1-2 nozzles on the sprayer that could be stacked as a pair, so it is an effective way to use existing nozzles to improve spray application with very little cost.

A First-timer's look at Tip Wizard



Download on the App Store
GET IT ON Google Play

TRY IT FREE AT
WWW.WILGER.NET

Tip Wizard shows great info like:

Adaptable Charts
Adjusts to alternate units & spacing

Boom Pressure

Speed Range

Duty Cycle (for PWM)

Spray Quality
For matching spray tips to chemical label requirements

[Advanced] VMD (in µ)

Median Droplet Diameter for comparing series of the same tip size

% of Volume < 141µ
For an estimate of driftable fines in ideal conditions

% of Volume < 600µ
For a relative factor of small droplets in ideal conditions

Back PWM / Search Tips / Results

Combo-Jet® DR110-05
Part No. 4801-05 Color Red
Series No. 30-March 1992(03-95)

Combo-Jet® MR110-04
Part No. 4801-04 Color Red
Series No. 30-March 1992(03-95)

Pres.	Speed	DOB	Class	VMD	<141	<600
Range	Range	15 mph		(microns)	(%)	(%)
25	4.53-16.1	82%	C	450µ	2%	76%
30	4.96-19.9	75%	C	425µ	4%	82%
35	5.39-21.4	70%	C	400µ	5%	86%
40	5.73-22.9	66%	C	380µ	6%	88%
45	6.08-24.3	62%	C	360µ	7%	90%
50	6.41-25.6	58%	C	340µ	8%	91%
55	6.73-26.9	56%	C	340µ	8%	92%
60	7.02-28.1	53%	C	330µ	9%	93%
65	7.30-29.2	51%	C	310µ	9%	94%
70	7.58-30.3	50%	C	300µ	10%	95%
75	7.85-31.4	48%	C	300µ	10%	96%
80	8.10-32.4	46%	C	290µ	11%	96%
85	8.35-33.4	45%	C	280µ	11%	96%
90	8.59-34.4	44%	C	270µ	12%	96%

Combo-Jet® DR110-04

Have More Questions?

Talk to your Wilger dealer,
or call

CANADA 1 (833) 242-4121
USA 1 (877) 968-7695

Beginner's Guide to using Tip Wizard

- Choose application units, spray system type, and search function** (e.g. Search for tips)
- Enter application rate, spraying speed¹, nozzle spacing, and spray tip angle².**
¹Since PWM systems can modulate flow by changing the spray duration, enter the MAX typical spraying speed.
²Spray tip angle required is based on nozzle spacing and boom height. Always maintain 100% overlap.

- Enter target spray quality or target droplet size (microns).**

<This is where Tip Wizard gets more useful>

Each chemical used in agricultural spraying has different spray quality requirements for best efficacy and also to maintain tolerable levels of driftable fines in ideal conditions. Using the droplet size (VMD) can allow a more advanced way to filter through series of tips. In the event a target spray quality is NOT possible, widening the spray quality to SEE ALL may be required. (e.g. targeting MEDIUM spray quality with nozzle sizes too large to produce M)

Where to find target spray quality or droplet size?

Depending on the chemical, as well as the different methods and modes of applications, some chemical labels may have less/more information. In general, chemical labels will have a description of how it should be applied, in the form of an ASABE spray classification recommendation, or a minimum spray classification (e.g. Spray at least ASABE Coarse)

Application Information:

- Water Volume: Minimum 22 L per acre. Minimum water requirement on chemical label by law
- Nozzles and Pressure: 30 to 40 psi (210 to 275 kPa) when using conventional flat fan nozzles. Reference max pressure for conventional nozzles like ER series. Try avoid no-drift reduction tips.
- Low drift nozzles may require higher pressures for proper performance. Use a combination of nozzles and pressure designed to deliver thorough, even coverage of ASABE coarse spray. Droplet spectrum recommendation for balance of drift & coverage.

Spray Categories as per ASABE S572.1 Classification

Extremely Fine Very Fine Fine Medium Coarse Very Coarse Extremely Coarse Ultra Coarse

For the example chemical label application information, we'd have a classification of COARSE droplet size to follow.

Considering the mode of application as well as the action (e.g. systemic herbicide vs. contact herbicide), you can choose the spray quality that would suit your conditions as best as possible. REMEMBER: the larger the droplet size/VMD, the coarser the spray, resulting in less coverage.

For advanced users, using a VMD droplet size can further filter into a spray quality to make it easier to compare one series to another. For an example, we might find we typically have windier conditions, so try filter our results to stay around 375µ-400µ for our targeted droplet size.

- Select the Best Spray Tip for your needs.**

Based on the operating speed, pressure, spray quality, and while also gauging the last few columns (VMD, % drift, % of small droplets for coverage), make a selection.

Picking Spray Tips for Auto-Rate Controlled Sprayers

- STEP 1: Size Your Tip** Since the application rate must be consistent, selecting a tip sized to the required rate over the actual sprayer speed range is critical. It is recommended to use Tip Wizard, as it will adjust the chart specifically for any application rate, not just common pairs of rate & speed.

FOCUS ON: SPEED & PRESSURE for a required APPLICATION RATE

Speed and pressure dictate a spray tip's ability to match a rate, and we must ensure our typical travel speed follows a reasonable pressure range. Meet your minimum speed (e.g. turning) within the operational pressure range. Having pressure too low in slow spots can lead to spotty coverage. Once you have referenced your chart to find your applied rate to your speed, you will find a certain nozzle size will be most effective.

***FOR PWM SPRAYERS (DUTY CYCLE):** Since you have more control of your pressure, your sprayer will typically allow for a wider selection of tip size. Try to pick a size that allows a duty cycle of 60-80% at your typical sprayer speed, allowing sufficient speed up/down.

- STEP 2: Filter to Your Spray Quality** Each chemical will require a nozzle spray quality (for labels that do not, consult chemical representative or agronomist, or general guide based on mode of action), since you have selected your tip size (e.g. 110-04) you can now find the best option within the series available in that nozzle size. The ER/SR/MR/DR/UR series differ based on spray quality & drift reduction.

FOCUS ON: 'ASABE S572' SPRAY CLASSIFICATION

Since the pressure is dictating the spray quality, you'll want to filter out any tip series that cannot apply the recommended spray quality.

***FOR PWM SPRAYERS (Pressure Selection):** Your spray quality can be changed with changing of sprayer pressure. This means instead of maintaining the required quality through a fixed operating pressure range, you can maintain a more flexible pressure range (provided duty cycle is OK).

- STEP 3: Double Check** It is worthwhile to review extra information provided for the spray tip, and re-evaluate if necessary. While the extra information in extrapolated from lab conditions without active ingredients, and cannot be considered actual, but it does lend to paint a picture of differences between series.

[ADVANCED] FOCUS ON: Spray % <141µ, Spray % <600µ, VMD (µ)

The extra columns reinforce the different spray qualities between different series, but also give the ability to make a rough spray plan for managing real life spraying conditions.

Spray % <141µ: % of total spray that can be considered driftable fines. In ideal conditions, it would be reasonable to assume this spray is NOT going where you want it to go. Due to evaporation before absorption, off-target spray or inversion, very small droplets will not likely hit target. Ideally have a spray tip that minimizes driftable fines, BUT ensure you maintain an acceptable level of coverage.

As speed, wind conditions & boom height increase, observed spray drift will increase substantially.

Spray % <600µ: % of total spray that can be considered small droplets. As % of these useful droplets lowers, coverage is reduced.

Consider it the 'other half' of the spray application, focusing on small droplets for coverage. Whereas you should maintain a low %<141µ, try to keep a %<600µ as high as possible, to maintain better coverage. As a very rough guideline with some usually chemical applications, aim for ~80+% <600µ for systemic applications; or ~90+% <600µ for contact applications; provided drift reduction levels are met and are satisfactory.

VMD (µ): The volumetric median diameter is the middle-point of spray distribution, and can be used to estimate between different series of the same size spray tips (tested on the same laboratory equipment). It is not for comparing between brands of tips. If you are familiar with using a VMD in tip searches, you can use it as an intensive filter to further focus in on tips that might work for your application. For example, if you are happy with spray application with the MR110-04 at ~3.5bar (346µ VMD), the spray quality might be comparable to an SR110-06 at ~3.5bar (337µ VMD). Bear in mind, VMD is used for educational purposes only, and should not dictate application.

For more Guides, Videos & Reading on proper nozzle selection, visit www.wilger.net

We aim to have all sorts of ways to help make the best educated decision in picking and using spray tips, so if there is something you find would be helpful, don't hesitate to reach out and ask. Often, we cannot provide EVERYTHING there is to know in our guides, as it can be overwhelming, so if you are wanting to get more information from an expert, contact WILGER.

Picking Spray Tips for Pulse Width Modulation (PWM) Sprayers

NOTE: PWM Spray systems differ in some respects (max flow capacity, pulse frequency (Hz), and other general variations in operation. This guide is a general guide that applies to most PWM spray systems, but for clarification would be based on a 10Hz solenoid, with a relative max flow capacity of 1.5 us gpm (this determines the relative pressure drop). Wilger does not own, produce, or have any ownership of PWM spray systems. All rights reserved by their owners.

- 1 STEP 1: Size Your Tip** Since the application rate must be consistent, selecting a tip sized to the required rate over the actual sprayer speed range is critical. It is recommended to use Tip Wizard, as it will adjust the chart specifically for any application rate. Since PWM sprayers have control of sprayer pressure, a PWM sprayer will typically allow for a wider selection of tip sizes.

FOCUS ON: SPEED, PRESSURE & DUTY CYCLE (DC%) for a required APPLICATION RATE

Speed, pressure and respective duty cycle dictate a spray tip's ability to match a rate, and we must ensure our typical travel speed follows a reasonable pressure range. Having duty cycles <50% can degrade spray quality and consistency of spray swath, so it is always recommended to be above that.

Try to pick a size that allows a duty cycle of 60-80% at your typical sprayer speed, allowing sufficient speed up/down. If a nozzle is approaching 90-100% at your maximum sprayer speed at your highest pressures, this can be a good indication that a nozzle is sufficiently sized.

Before you look at any coverage/spray quality characteristics of a nozzle, you should have solidified which nozzle SIZE will work best first.

- 2 STEP 2: Filter to Your Spray Quality** Each chemical will require a nozzle spray quality (for labels that do not, consult chemical representative or agronomist, or general guide based on mode of action), since you have selected your tip size (e.g. 110-04) you can now find the best option within the series available in that nozzle size. The ER/SR/MR/DR/UR series differ based on spray quality & drift reduction.

FOCUS ON: 'ASABE S572' SPRAY CLASSIFICATION

Since the pressure is dictating the spray quality, you'll want to filter out any tip series that cannot apply the recommended spray quality. Since PWM gives full control of sprayer pressure, this will usually filter the results to 1-2 nozzles within a size or series.

- 3 STEP 3: Pick your most flexible spray nozzle** It is worthwhile to review extra information provided for the spray tip, and re-evaluate if necessary. While the extra information in extrapolated from lab conditions without active ingredients, and cannot be considered actual, but it does lend to paint a picture of differences between series.

The goal is to select a nozzle that can be applied at relatively moderate pressures (e.g. 3.5-4bar) when spray conditions are ideal, giving a means to reduce pressure to 2-3bar to have a 'drift reduction mode' that can be called upon when less ideal conditions arrive.

[ADVANCED] FOCUS ON: Spray % <141µ, Spray % <600µ, VMD (µ)

The extra columns reinforce the different spray qualities between different series, but also give the ability to make a rough spray plan for managing real life spraying conditions.

Spray % <141µ: % of total spray that can be considered driftable fines. In ideal conditions, it would be reasonable to assume this spray is NOT going where you want it to go. Due to evaporation before absorption, off-target spray or inversion, very small droplets will not likely hit target. Ideally have a spray tip that minimizes driftable fines, BUT ensure you maintain an acceptable level of coverage.

As speed, wind conditions & boom height increase, observed spray drift will increase substantially. With wind speeds of 19kph+, it can be expect to have driftable fine spray double. Windy conditions, higher drift sensitivity, and other environmental reasons are serious considerations for what might be an acceptable level of driftable fines.

By general chemical mode of action, you might have a reference point for % driftable fines, which might be generalized as:

Systemic Herbicides: Try maintain driftable fines <10%. (For very sensitive applications and herbicides, the requirement might go down to even 1.5-5%)

Contact Herbicides & Fungicides: Try maintain driftable fines <15%. This allows for a consistent and high level of coverage without losing a great deal of driftable fines. It is often part of a good balance between driftable fines and coverage.

Spray % <600µ: % of total spray that can be considered small droplets. As % of these useful droplets lowers, coverage is reduced.

Consider it the 'other half' of the spray application, focusing on small droplets for coverage. Whereas you should maintain a low %<141µ, try to keep a %<600µ as high as possible, to maintain better coverage. As a very rough guideline with some usually chemical applications, aim for ~80+% <600µ for systemic applications; or ~90+% <600µ for contact applications; provided drift reduction levels are met and are satisfactory.

VMD (µ): The volumetric median diameter is the middle-point of spray distribution, and can be used to estimate between different series of the same size spray tips (tested on the same laboratory equipment). It is not for comparing between brands of tips. If you are familiar with using a VMD in tip searches, you can use it as an intensive filter to further focus in on tips that might work for your application. For example, if you are happy with spray application with the MR110-04 at ~3.5bar (346µ VMD), the spray quality might be comparable to an SR110-06 at ~3.5bar (337µ VMD). Bear in mind, VMD is used for educational purposes only, and should not dictate application.

Quick-Start Example: 100 L/Ha @ 16 kph max, on 50cm spacing, with a PWM Spray System, applying SYSTEMIC HERBICIDE (glyphosate)

STEP 1: SIZE THE NOZZLE: Focus on Pressure/Speed Range/Duty Cycle (Try maintain ~60-80% duty cycle through full speed/pressure range)

For the best option for a tip size, we'll focus on the **110-04 size**. (110-05 would also be a good nozzle size, but 110-06 starts getting too large for optimal PWM system use) It would apply 100L/Ha, 16kph anywhere between 2.2-4bar, allowing more than enough room into turn situations if turn compensation is available.

STEP 2: QUALIFY THE SPRAY

Since the chemical label for glyphosate requires a 'even coverage of **ASABE COARSE droplets**', we will notice the ER110-04 is too fine, the SR fits at only lower pressures, the MR fits well, and the DR/UR being perhaps too coarse. We could also use a VMD of 350-400µ to filter out more. Note: The DR & UR series are coarser than required, but might be suitable for applicators who have to apply into more drift-sensitive areas.

For this example, we will single out the MR110-04 as our best tip to maintain a healthy flexibility to reduce spray drift on the go.

STEP 3: DOUBLE CHECK MR110-04 for max flexibility between 'IDEAL SPRAYING MODE' & 'DRIFT REDUCTION MODE'

Ideal Condition Spraying @ 16kph: **Drift Sensitive Spraying @ 16kph:**

@3.5bar: DUTY CYCLE: 81% Excellent **@2.5bar: DUTY CYCLE: 96%** OK

@3.5bar: COARSE Spray Class **@2.5bar: VERY COARSE Spray Class**

@3.5bar % < 141µ: ~8% Very Good **@2.5bar % < 141µ: ~6%** Excellent

@3.5bar % < 600µ: ~92% Excellent **@2.5bar % < 600µ: ~87%** Excellent

Further considerations: Given the high level of coverage at higher pressures (4bar+), this same nozzle could be used for contact herbicides and fungicides to cover more applications.

Combo-Jet® MR110-04							
Part No: 40291-04 Color: Red Screen No: 50 Mesh (#40250-00)							
Pres	Speed Range	DC @ 16 km/h	Class	VMD	<141	<600	
bar	km/h	%		µ	%	%	
1.5	3.2-12.9	>100	XC	469µ	2%	74%	
2	3.7-14.9	>100	VC	429µ	4%	82%	
2.5	4.2-16.7	96	VC	399µ	6%	87%	
3	4.6-18.3	87	C	374µ	7%	90%	
3.5	4.9-19.7	81	C	353µ	8%	92%	
4	5.3-21.1	76	C	335µ	9%	93%	
4.5	5.6-22.4	72	C	319µ	10%	94%	
5	5.9-23.6	68	C	304µ	10%	95%	
5.5	6.2-24.8	65	C	291µ	11%	95%	

Picking Nozzles for Double Nozzle Spraying

Picking two spray tips isn't much different than a single tip. Since the sprayer has some means of adjust the flow to match a flow rate, simply pick a nozzle size that would supply the full rate, and then split it into parts that would provide the same flow rate. E.g. If a 110-10 nozzle size is required for an application, suitable pairs would be like a '110-06 + 110-04' or '110-05 + 110-05', as the cumulative size would apply the same rate as a single 110-10. Limit the size difference to two nozzle sizes to ensure consistent back pressure between both nozzles. (e.g. 110-08 + 110-02 would not be ideal as the -08 might steal flow from the -02). ALWAYS enter the cumulative size of nozzles into the controller. Not just one of the nozzles. (e.g. if a 110-04 + 110-06 were used, a -10 size nozzle would be entered)

- 1 STEP 1: Size Your Tip** Since the application rate must be consistent, selecting a tip sized to the required rate over the actual sprayer speed range is critical. It is recommended to use Tip Wizard, as it will adjust the chart specifically for any application rate, not just common pairs of rate & speed.

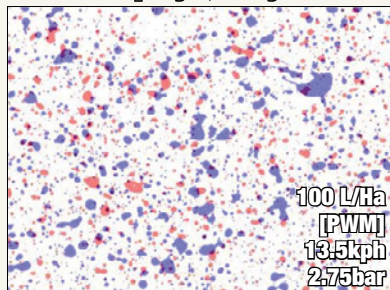
FOCUS ON: SPEED & PRESSURE for a required APPLICATION RATE

***FOR PWM SPRAYERS (DUTY CYCLE):** Since you have more control of your pressure, your sprayer will typically allow for a wider selection of tip size.

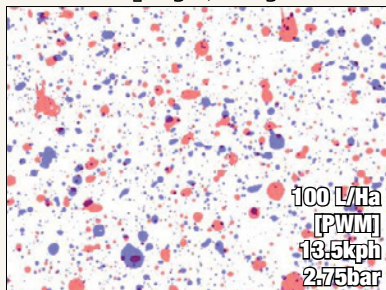
Try to pick a size that allows a duty cycle of 60-80% at your typical sprayer speed, allowing sufficient speed up/down.

- 2 STEP 2: Filter to Your Spray Quality** Each chemical will require a nozzle spray quality (for labels that do not, consult chemical representative or agronomist, or general guide based on mode of action), since you have selected your tip size (e.g. 110-04) you can now find the best option within the series available in that nozzle size. The ER/SR/MR/DR/UR series differ based on spray quality & drift reduction.

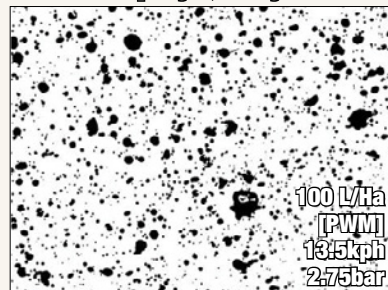
Example: **MR110-04 + MR110-02**
Spray Quality: **Coarse***



Example: **2x SR110-03**
Spray Quality: **Coarse***



Single Tip Example: **SR110-06**
Spray Quality: **Coarse***



***IMPORTANT: FOR PWM SPRAYERS (Pressure-drop through solenoid):** Depending on the solenoid used, for larger nozzle sizes (or paired nozzle sizes) there will be greater pressure drop. So, when considering spray quality for the smaller nozzles in a pair, verify the pressure drop for the cumulative size as it will differ from the nozzles individually. With the pressure drop factor, cross-reference the spray quality of the smaller nozzles in the pair for their more realistic spray quality (after pressure drop). ALWAYS enter the joint nozzle size in the controller.

- 3 STEP 3: Double Check** Just like the 'Quick-start guide to picking spray tips', refer to the extra information to qualify nozzles to ensure they will suit your application. Since the pair of nozzles are spraying a fraction of the total weight, there is some synergy between having one as a finer nozzle and the other coarser to produce a more meaningful mix of spray droplet sizes to get where they need to go.

[ADVANCED] FOCUS ON: Spray % <141µ, Spray % <600µ, VMD (µ)

The extra columns reinforce the different spray qualities between different series, but also give the ability to make a rough spray plan for managing real life spraying conditions.

Spray % <141µ: % of total spray that can be considered driftable fines. If one nozzle is producing more driftable fines than the other, but when averaging based on the flow, you'd want to ensure you are still at a tolerable driftable fines % given the application.

As speed, wind conditions & boom height increase, observed spray drift will increase substantially. This is especially the case with forward/backward facing nozzles.

Spray % <600µ: % of total spray that can be considered small droplets. As % of these useful droplets lowers, coverage is reduced.

Since you are splitting a single 'large' nozzle into two smaller nozzles, you should take advantage of getting a much higher %<600µ than possible with a single nozzle.

VMD (µ): As VMD is the middle point in the distribution of spray, and a pair of nozzles will have a blended VMD when both are considered, simply qualify a tip based on acceptable spray quality first, and take note of the two nozzles and

EXAMPLE: 220 L/ha Glufosinate (Contact Herbicide), on 50cm spacing, traveling 16 kph, using a PWM spray system

STEP 1: Using Tip Wizard (or nozzle charts), a 110-125 nozzle size would suffice for travel speed and pressure range. The ER110-125 is shown as an example. With this 110-125 nozzle size, we know a nozzle pair adding to a ~110-125 would be suitable for the application rate. (e.g 110-06 + 110-06) Either use the TIP WIZARD double-down function, or split the search into two parts that add up to the total application rate required (220L/ha)- e.g. 2x 110L/ha. There is additional pressure drop through a solenoid, so keep that in mind when selecting nozzles as the spray quality will differ from nozzles operating separately.

STEP 2: By chemical label, Glufosinate is to be applied as a ASABE medium spray quality or coarser. Qualify spray nozzles suitable for chemical label requirement. Remember, if you cannot find a spray quality in the chart or in tip wizard, you will have to widen your spray quality search or split to a double down configuration that can provide closer to the ideal spray quality.

Combo-Jet® ER110-125 Part No: 40281-125 Color: Teal Screen No: Not Required									
Pres	Speed Range	DC @ 16 km/h	Class	VMD	<141	<600			
bar	km/h	%		µ	%	%			
1.25	3.4-13.5	>100	XC	476µ	6%	56%			
1.5	3.7-14.8	>100	XC	460µ	7%	61%			
2	4.3-17.1	94	XC	433µ	8%	67%			
2.5	4.8-19.1	84	XC	412µ	9%	71%			
3	5.2-21.0	76	XC	396µ	10%	74%			
3.5	5.7-22.7	71	XC	381µ	10%	77%			
4	6.1-24.2	66	VC	369µ	11%	79%			
4.5	6.4-25.7	62	VC	358µ	11%	80%			
5	6.8-27.1	59	C	348µ	12%	81%			

DOUBLE DOWN ADAPTER (#40441-00) with an SR110-06 + SR110-06									
COMBO									
Combo-Jet® SR110-06 Part No: 40287-06 Color: Grey Screen No: Not Required									
Pres	Speed Range	DC @ 16 km/h	Class	VMD	<141	<600			
bar	km/h	%		µ	%	%			
1.5	3.6-14.5	>100	XC	539µ	1%	56%			
2	4.2-16.7	96	XC	494µ	2%	69%			
2.5	4.7-18.7	86	VC	460µ	4%	77%			
3	5.1-20.4	78	VC	431µ	5%	82%			
3.5	5.5-22.1	73	VC	407µ	6%	85%			
4	5.9-23.6	68	C	387µ	8%	87%			
4.5	6.3-25.0	64	C	368µ	9%	89%			
5	6.6-26.4	61	C	352µ	9%	90%			

Example Result:
Double-Down SR110-06 would provide upwards of 9%+ more volume made of small droplets (%<600µ), while nominally decreasing driftable fines (%<141µ) especially at lower pressures.

The spray quality is within the 'coarse' spray quality, just outside MEDIUM spray quality. An ER110-06 series could be replaced for one of the SR110-06 to provide a mix of even finer spray into the dual nozzle setup.

Total nozzle flow would be the same as a 110-12, which would be nominally smaller than a 110-125.

STEP 3: Qualify nozzle pair based on spray quality, and pick based on most suitable % driftable fines (ideally <15% <141µ) and % coverage factor (ideally near or greater than 90% <600µ)