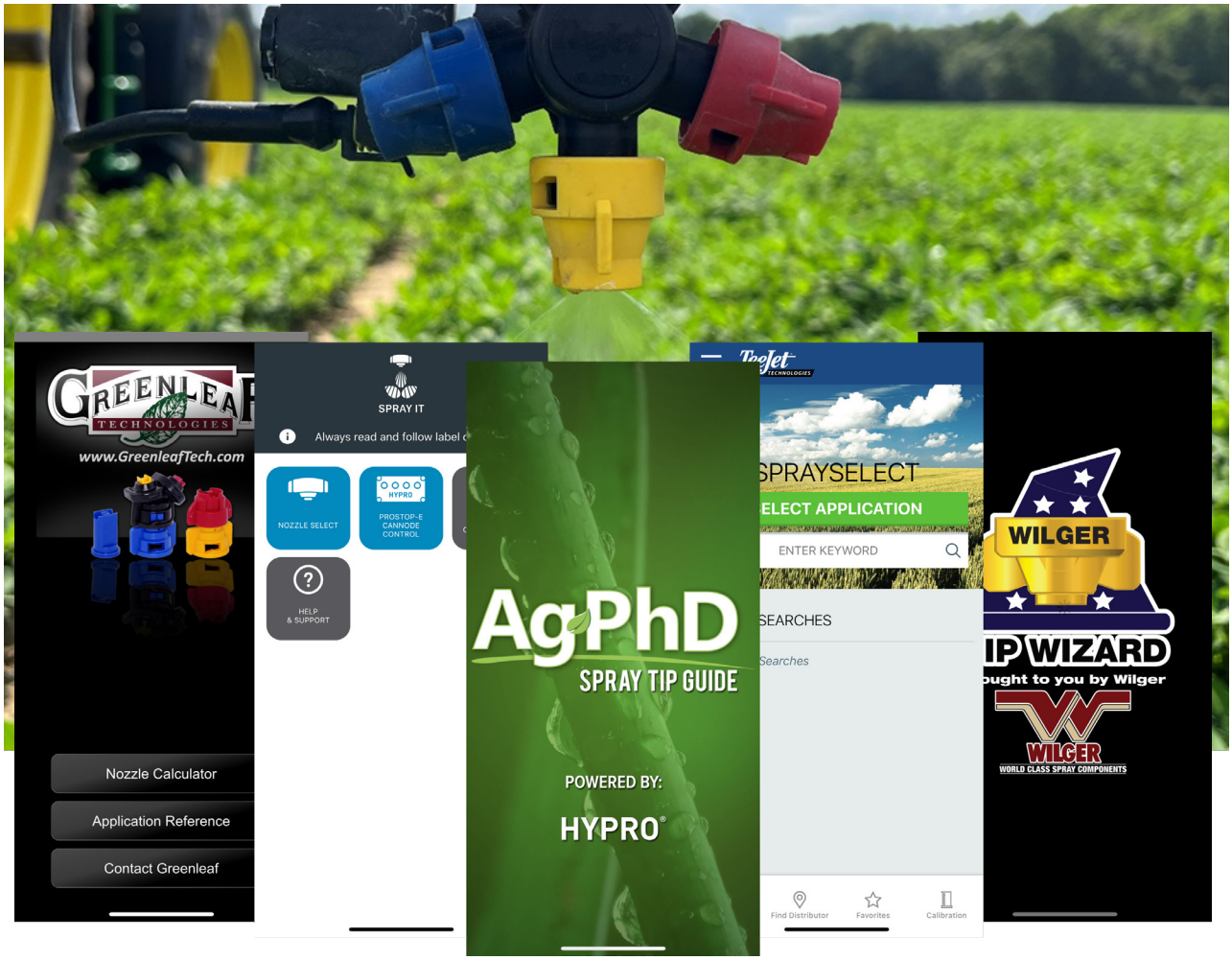
Mobile Apps for Spray Nozzle Selection

► Choosing the right nozzle is important for effective pesticide applications with agricultural sprayers as it determines the amount of liquid per unit area and the size of the spray droplets. Applying the correct application rate and desired droplet size is essential for achieving adequate spray coverage on the target surface, maintaining the uniformity of application, and minimizing the risk of spray particle drift.

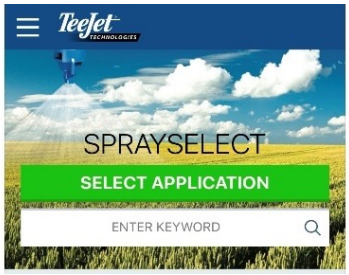
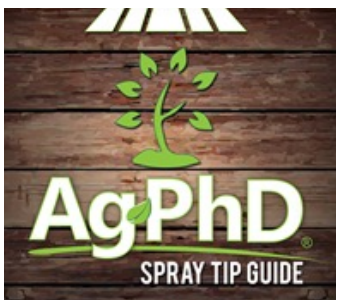


The two main considerations when selecting the best nozzle for an application are nozzle type and size. Spray nozzles come in different types and sizes based on the broader range of pesticide and liquid fertilizer applications performed in agriculture. Most nozzle manufacturers have catalogs with detailed tables and charts to assist applicators in selecting spray nozzles. These catalogs are useful tools, but the process can still be overwhelming. Most of these nozzle selection catalogs contain limited information with only a selected combination of application parameters (application rate, ground speed, nozzle spacing, etc.) and may not be useful in cases of a specific sprayer setup or application scenario.

Fortunately, several mobile applications (apps) are available from nozzle or sprayer manufacturers that are useful to applicators for nozzle selection based on their specific set of parameters. Compared to nozzle catalogs, these apps are user friendly and expedite the nozzle selection process. They usually have no subscription fees and are available for download on iOS and Android devices. Several of these apps are also available as online calculators or tools that can be accessed and used on any device with internet and web-browsing capabilities.

Available Nozzle Selection Apps

The following lists the apps currently available through major nozzle and sprayer manufacturers in the United States, along with information regarding their availability on mobile and desktop devices. A link to access the information about each app or online calculator is also provided.

	Name	Developer	iOS	Android	Web
	SpraySelect	TeeJet Technologies	X	X	X
	https://sprayselect.teejet.com/nozzles				
	Tip Wizard	Wilger Inc.	X	X	X
	https://www.wilger.net/tip-wizard/				
	NozzleCalc	Greenleaf Technologies	X	X	X
	https://greenleaftech.com/dynamic.php?pg=Choosing_the_Right_Nozzle/Nozzle_Calculator				
	Spray It	Pentair Flow Technologies	X	X	X
	http://sprayit.pentair.com/				
	Spray Tips Guide	Ag PhD	X	X	
	https://agphd.com/agphdmobileapps/				

	Name	Developer	iOS	Android	Web
	Nozzle Configurator Assistant	Kuhn SA	X	X	
	https://www.kuhn.com/en/services-parts/online-services/configuration-assistance-apps/nozzle-configurator-assistant				
	Equipment Mobile	John Deere	X	X	
	https://www.deere.com/en/parts-and-service/parts/ag-parts/sprayer/				
	MyHARDI	HARDI International A/S	X	X	
	https://hardi.com/en/our-company/media/myhardi				

Regarding functionality, most of these apps use the same application-related information—target rate, nozzle spacing, ground speed, desired droplet size—to provide nozzle options that are best suited for the intended application. A few apps also provide specific nozzle recommendations based on the pesticide type and mode of action. To best use this information for nozzle selection, choose the app specific to your nozzle or sprayer brand (if available), as that will most likely be the best choice and would have all the nozzle type and size options for that brand. When selecting the best nozzle from the options suggested by the app, consider the one that can maintain the target rate (for sprayers equipped with a rate controller) or droplet size (for sprayers with PWM [pulse width modulation] technology) across a wide range of ground speeds and application conditions.

Using a Nozzle Selection App

The following steps explain how to use the TeeJet Spray Select App to choose a nozzle for the intended pesticide application.

Example Application Scenario: An applicator wants to perform a broadcast herbicide application in corn using 15 gallons per acre (GPA) of spray volume at a speed of 8 mph using a large, self-propelled agricultural sprayer. The nozzle spacing on the sprayer boom is 20 inches, and the desired droplet size for this application is medium spray droplets. The product to be sprayed is Liberty (glufosinate), a contact herbicide that requires thorough spray coverage for effective weed control.

1. Determine the target parameters for the intended application:

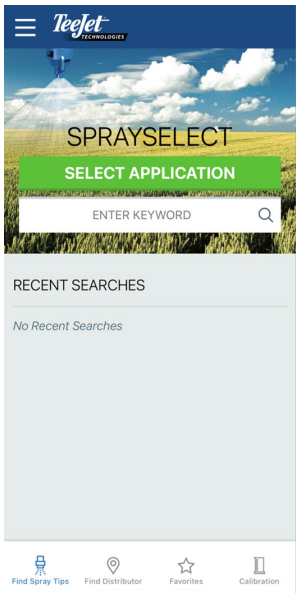
   Target Application Rate = 15 GPA

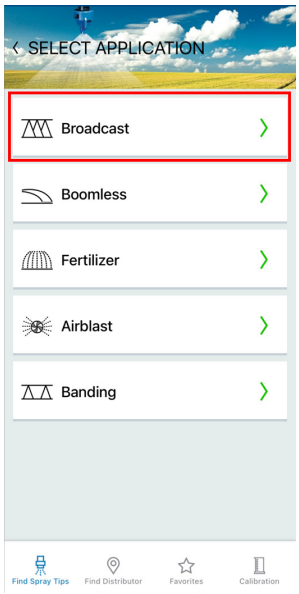
   Ground Speed = 8 mph

   Nozzle Spacing = 20 inches

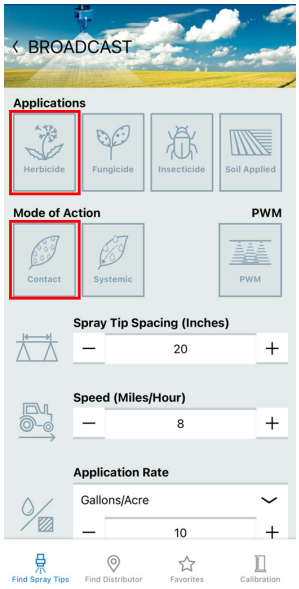
   Droplet Size = Medium

2. Open the TeeJet SpraySelect app and select the type of application from the options on the screen. In this case, it will be a Broadcast application with a ground (boom) sprayer.

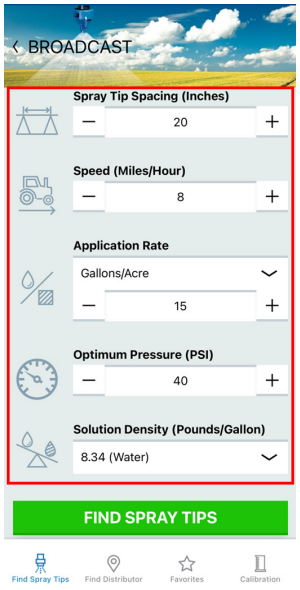




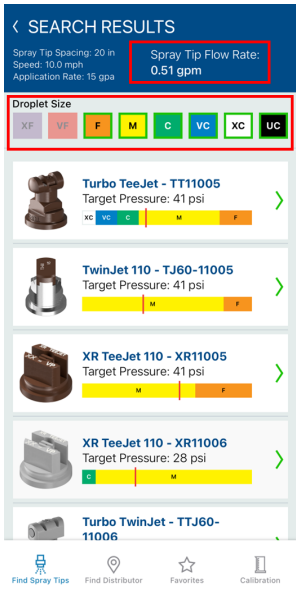
3. Next, select the type of pesticide application from the listed options and the mode of action of the pesticide product. This information can be found on the pesticide label under the application requirements. In this case, the mode of action is Contact as Liberty is a contact herbicide. Note that certain product labels, such as Engenia (dicamba), require specific nozzles to obtain thorough spray coverage and mitigate spray drift concerns by utilizing coarser droplets. Also, carefully note requirements for other application parameters, such as only spraying at travel speeds less than 10 mph. Apps with a PWM option listed only need to be checked if the sprayer is equipped with the PWM technology.



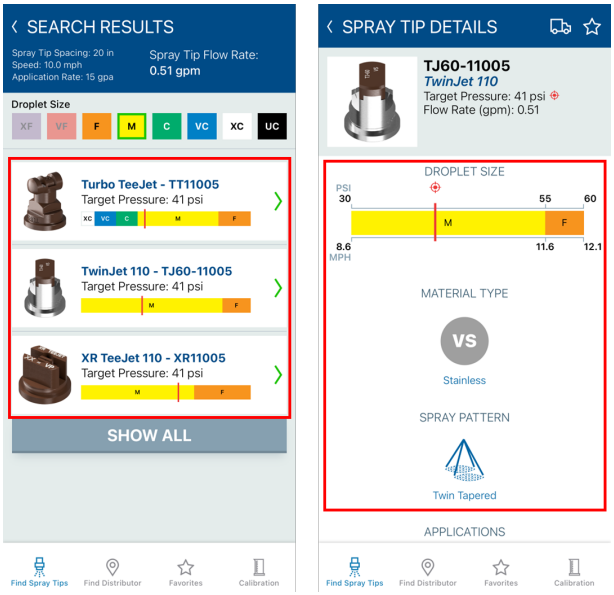
4. Next, enter the desired application parameters determined in step 1. In this case, the nozzle spacing is 20 inches, the speed is 8 mph, and the application rate is 15 GPA. Keep the optimum pressure at 40 PSI (unless a specific pressure is needed for this application) as most spray nozzles perform best within the 30 to 50 PSI pressure range. For most pesticide applications, water by default is the carrier; therefore, keep the solution density at 8.34 pounds per gallon (lb/gal) unless using another carrier with a different density. Select the option Find Spray Tips after all parameters have been correctly entered.



5. The next screen will display the nozzle flow rate in GPM (gallons per minute) and list all the nozzles that meet those application requirements. These options can further be narrowed by selecting the desired droplet size (Medium in this case) for this herbicide application.



6. After droplet size selection, the final screen will show only the nozzle options best suited for this application in meeting the target rate and droplet size requirements. In most cases, it is common to have more than one nozzle that would be optimal for the intended application. Information on the type of weed, disease, or pest being targeted, the crop being sprayed, canopy penetration, etc., can further help narrow the options to a nozzle best suited for the intended application. Therefore, selecting the best nozzle out of these options can be solely up to the applicator based on the factors listed earlier or if a particular nozzle type is already available and can be utilized to be economical.



Pressure variations are also common during pesticide applications with ground sprayers, so selecting a nozzle that can maintain the desired droplet size over a wide range of pressures would ensure spray quality across the field. Considering that, the TJ60-11005 would be the preferred nozzle out of the three nozzle options recommended by the app for the example application discussed here.

Most nozzle selection apps require the user to enter some of the same basic application parameters. In this publication, one particular app (TeeJet SpraySelect) was used as an example to highlight the typical application parameters required as inputs, and the example screens were displayed to show the nozzle selection process. It should be noted that the layout of different screens could differ based on the specific app being used. Some apps may also have additional functions, such as computing different pesticide product amounts for a target application or a calculator for calibrating a sprayer.

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