

# Thinking of Getting a New Sprayer? Look for These Features

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Sprayer technology is one of the fastest changing areas in the agricultural machinery world. Progress in the design of all aspects of the sprayer has provided a large number of options for applicators, and it can be a daunting task to decide what features are important, and which ones to avoid. Here's a look at some highlights:

## ***Focus on Your Goals***

Before you make a sprayer change, think about what you're trying to accomplish and how your current sprayer is meeting those goals or falling short. For example, you may find yourself doing more fungicide spraying or pre-harvest weed control. As a result, a suspended boom design would minimize tracks and add clearance. Or, you have added land to your operation and need more capacity. Do you need a faster sprayer, or a wider boom, or both? Often, marketing of new sprayers does not focus on your individual needs, requiring careful scrutiny of each machine. You might buy a larger, more expensive sprayer and still be limited in what you need to achieve.

## ***Capacity***

With larger farms and increased emphasis on proper staging for control of many pests, area per hour can be one of the most important aspects of spraying. A good spraying job, but done at the wrong time can be a waste of effort. Given the choice, opt for boom width over travel speed to increase your capacity. Fast travel speeds can cause problems that are difficult to solve, such as excessive dust generation, distorted spray patterns behind the sprayer tank, and possibly less effectiveness behind the sprayer wheels due to aerodynamic forces. Wider booms avoid these problems, and with modern suspension and automatic boom height control, are very stable.

## ***Filling***

The amount of time spent filling the sprayer can be a significant productivity factor. Spending 5 minutes less time filling for every hour spraying can make the difference between getting the job done while conditions are good and needing to compromise to finish the field. The size of water inlet plumbing, the capacity of the pump, the convenience and safety of chemical induction, the visibility and reliability of gauges on the tank all play a role. Larger tanks allow for longer intervals, but add weight, possibly leading to other problems under wet conditions.

## ***Cleaning***

Moving between crops often requires complete and thorough decontamination of the tank, and possibly any shrouds (hoods) covering the boom. Consider the following: How empty does the sprayer pump its tank? Can the remainder be drained easily, in a complete and controlled manner? Is there a washdown nozzle, and can the various sections of plumbing be reliably emptied and flushed? Look for features such as clean water reservoirs, valving systems that allow cleaning on-the-go, and pressurized washers for cleaning the external and more remote parts of the sprayer. How easily are the filters and nozzle screens accessed and removed? Again, productivity is the key, as is confidence of a complete job that protects the next crop to be sprayed.

## ***Boom Height and Level***

As booms become wider, maintaining a low and consistent height is more of a challenge. Research shows that low booms not only reduce spray drift, but also enhance canopy penetration and can help the effectiveness of directed sprays (nozzles pointed forwards or backwards). A good boom and sprayer

suspension system, easy controls, or automated levelling systems are useful. With automated boom levellers, ensure that response time is adequate for your travel speeds and that the sprayer's hydraulic system and booms design can handle the extra stress (force, heat) that is generated with some system. Sensors that determine the boom height need to function well over a number of different crops and growth stages. A good working system removes stress from the applicator while improving the quality of the spray job.

### ***Navigation***

GPS guidance has revolutionized field equipment operation. The reduction in waste due to misses or overlaps, as well as reduced stress on the operator has obvious benefits. Auto-steer can allow the operator to focus on other aspects of the operation such as spray pressure, nozzle operation, or boom height.

### ***Spray Pressure***

The single most important part of proper nozzle performance is operating the nozzle at its optimum spray pressure. No matter which nozzle you choose, make sure you know the sprayer's current operating pressure. A large pressure gauge mounted in clear view while looking ahead is imperative. Ensure that the signal for the pressure gauge originates at the boom, as close to the nozzles as possible, not the pump. Pump pressures are often significantly higher than actual boom pressure, especially for larger units where pressure drop to the booms can make the difference between good and poor nozzle performance.

### ***Nozzle Flow Sensors***

With wider booms it can be difficult to see whether a nozzle is operating well. Rate controllers cannot help here; they monitor total boom flow and simply adjust pressure to compensate for any flow reduction due to a plugged nozzle. Flow sensors that monitor and compare the flow of a small section of the boom can quickly identify when and where a plugged nozzle occurs. Make sure these are mounted where they are easily observed, in your natural field of view.

### ***Sprayer Weight***

Large sprayers can be very heavy. Weight requires structural strength and horsepower, which adds more weight. Pretty soon, the weight and size of the machine can create problems in terms of wheel tracks, loss of ability in soft conditions, and poor aerodynamics behind the tractor unit. Consider lighter units, even if it means some loss of capacity. Capacity losses can be recouped by extending the conditions under which the sprayer can be used, and by an overall higher quality job.

### ***Nozzle Technology***

There is more to say on this subject than space allows. One thing of importance is to make sure your nozzle's pressure capabilities match your expected ground speed fluctuations. A doubling of travel speed requires a quadrupling of spray pressure. If you expect that type of dynamic, make sure you obtain nozzles that produce acceptable patterns over your expected pressure range, and be aware of changes in droplet size that accompany these changes. Most air-induced nozzles, while requiring overall higher pressures, maintain larger and more consistent droplet sizes over a wide pressure range than conventional nozzles. We continue to see evolution in nozzle technologies, and some traditional limitations are become less problematic. There are some emerging technologies that allow for wider than normal flow ranges with minimal impact on droplet size or spray pattern. Some of these (CNH Aim Command, Capstan Sharpshooter) are already proven, while others (VariTarget, Greenleaf Variable Rate TurboDrop) are new and require testing. Stay tuned for these developments.