



Getting the most out of pest management today and tomorrow

Simple modifications to spraying approaches and equipment can dramatically boost efficacy and reduce drift.

The toolbox for crop spraying is getting bigger – with loads of innovations both today and in the future that producers can take advantage of.

One person focused on the leading edge on both areas is Chris Nesser of Alberta Agriculture and Rural Development (ARD). As a weed science researcher with a strong interest in spraying approaches and sprayer technology, Nesser has one eye on the future and the other on the tools available today.

“The area of spraying and sprayer technology is one of the most promising areas for its potential to improve how we go about the process of pest management,” says Nesser. “New technologies beginning to come on stream and those further back in the pipeline represent tremendous opportunity for the future. At the same time, however, we already have very good knowledge and tools at our disposal to make strong improvements right now.”

Solid options in today’s toolbox

Among the options producers and other applicators have access to now are a number of relatively simple modifications to spraying approaches and equipment that can dramatically boost efficacy and reduce drift, says Nesser.

Sprayer shrouds and cones, spray curtains. “Each of these can be very effective at reducing the potential for drift, particularly under conditions where factors such as

wind and/or sprayer speed are a greater concern,” he says. Studies have shown they can reduce drift by 30 to 50 percent.

Low-drift nozzles, air induction tips. These target-strengthening options are becoming a must have. “Low-drift nozzles have arguably been the single greatest advancement in recent years to improve targeting,” says Nesser. “These are the types of nozzles every applicator should be using.”

Air-induction tips also help reduce drift, by pushing out a downward air stream that directs the spray droplets toward the targeted area. “Using both is an excellent combination to minimize drift,” he says.

Chemical injection on sprayer. This approach is not yet commonly used but is the focus of increasing interest. With this system, the main carrier tank is loaded with clean water. Concentrated chemical is injected and mixed just before it is sprayed out of the boom. This brings a number of advantages ranging from removal of the need to pre-mix chemicals in the main carrier tank, to ease of cleaning and product change, to the benefit of no leftover mixed product to manage. “It offers lots of different benefits that add up to a strong advantage,” says Nesser.

Chemical handling system with chemical jug rinse. The major innovations in this area are greater automation which reduces handling for the applicator. “There

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are a lot more options today than there were a few years back,” says Nesser.

Sectional control operating system for sprayer. The emergence of sectional control technology opens up a new area of potential for spraying, by allowing applicators to separately control different sections of a sprayer boom. The current main use of this option is to allow spraying when only a portion of the boom is needed. “Particularly with the size of many sprayers today, sectional control adds a lot of capacity to how you can manage,” says Nesser. “I expect we’ll see many applications and new options emerging around this technology.”

Field history and production record keeping software. This is an area where in Nesser’s opinion, the more producers can automate their workload, the better. “Producers are asked to keep up with a lot and more and more management is based on keeping and analyzing increasing volumes of data. Software that helps them do this job is invaluable. Training and support is also very important in this area because anyone can purchase the software but you need to know the ins and outs to get the most use and value out of it.”

What the future holds

These are just a few tools among many that can benefit producers, and Nesser sees more dramatic innovations coming around the corner. What will spraying practices look like 10 or 15 years from now? Here his take:

Advances in precision farming. Nessor views the increasing adoption of precision farming approaches as having the most dramatic impact. “Technology wise, the two most powerful emerging tools that will impact agriculture in the next decade are Global Positioning System (GPS) and Geographic Information Systems (GIS),” he says.

Along with associated tools including a wide range of sensors, monitors and controllers, these technologies will enable farmers to use electronic guidance aids to direct sprayer equipment movements more accurately and provide precise positioning for all sprayer equipment actions, including pesticide applications. They will also provide thorough data of all activity that can be analyzed in association with other sources of information, such as agronomic and climatic data.

“Precision agriculture is already growing in adoption and making an impact,” says Nesser. “I believe we’re going to

see far more advances in terms of its application, including the task of managing environmental considerations. For example, it will automate things like keeping distances from waterbodies and neighbouring ecosystems. It will become more user friendly and continue to incorporate more of the variables farmers need to manage.”

Variable rate technology (VRT). One particular area of advancement Nesser is optimistic about is variable rate technology (VRT) for spraying. This would allow farmers to vary spraying rates within a field, potentially resulting in greater efficiency and the opportunity to “optimize” crop protection and ultimately environmental protection. “We’re not seeing many applications of VRT for spraying yet and that may still be a ways into the future. However once a few of the obstacles are overcome it’s an approach that really makes sense. It has the potential to be revolutionary for spraying.”

Second product injection capacity. Among other advances, Nesser sees potential for sprayers to add a second product without tank mixing. “Basically, injecting the herbicide. You would have more than one line going out on your boom and you could apply the second product only as needed.”

Do-it-all nozzle systems. Nozzles are another area where the advances seen today are set to reach another level, he says. “I can envision a sprayer where you have three or four different types of head designs that you spray in conjunction or as needed throughout the whole field. All would be designed and used to maximize efficiency, efficacy and targeting.”

Sensors and other simple helpers. The future also holds simple advances, says Nesser. “There’s lots of potential for tweaks and improvements here and there. For example, there’s no reason we couldn’t have sprayers equipped with sensors that can tell you right away whether your nozzles are in need of replacement. If you have better nozzles and replace them more frequently, that could do a lot to improve efficacy.” ▲

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