

# Modern Machinery Matters



Father and son team David and Jim Maitland see the AIM Command and Patriot 4410 combination helping to deliver a more efficient spray application and less worry at the end of the day about chemical drift.



## Know the basics to capitalise on new spray technology

**W**ith the cost of chemicals having doubled over the past two years, contractors and farmers are moving to systems such as Case IH's AIM Command which delivers precise and efficient chemical application in a range of field conditions and at speeds of up to 40 km per hour.

AIM Command, which is exclusive to the Case IH range of Patriot sprayers, allows operators to specify droplet size and pressure from the cab, regardless of water rate or ground speed.

The end result is more efficient chemical application and less spray drift – two factors at the forefront of most operator's minds as they contend with high input costs and an increasingly litigious farming environment.

Through workshops held throughout the country, Queensland-based consultant Bill Gordon helps farmers get a better understanding of the chemical spray application process.

"The workshops are about helping farmers make more informed decisions," says Bill. "Farmers are concerned with minimising drift and getting the right amount of product onto the target crops. We discuss how differing conditions affect the behaviour and survival of droplets, and the way

various products interact with their targets. With all these skills in hand, we then look at choosing the right set up to achieve the desired outcome."

### Understand the basics

Bill says understanding the basics is the key to good application.

"It is critical to manage the issues affecting the application. Over the past 10 years or more there has been a big transition to automatic rate control, and this has taken some thought out of the process, with a tendency to treat it as a cure-all – which it is not.

"Changing speed can considerably change the droplet size. Using automatic rate control, over an 8 km per hour speed range, pressure can vary by up to two bar. This may lead to between 10 and 40 per cent product loss due to the production of fine droplets," Bill warns.

"But the AIM Command system maintains constant pressure at the nozzle regardless of speed, which overcomes a lot of the problems of other systems. It's still vital to get the basics right, but AIM Command makes that easier to do," Bill says.

"Any system that gives a constant droplet spectrum has got to be a big step in the right direction."

### How the system works

AIM Command does not physically change the nozzles. Rather, it changes the liquid flow into the nozzles and the operator can switch between conventional spraying and AIM Command spraying as required.

The system's primary mechanism is a solenoid valve that is set to cycle 10 times per second. The length of time the valve remains open during each cycle determines the amount of chemical released – or the flow rate. An electronic controller automatically adjusts the spray pulse

...30▷

## Modern Machinery Matters

*is proudly supported by*

**CASE IH**  
AGRICULTURE





**The Patriot 4420.**

## SPRAYER BREAK-IN PERIOD: THE KEY TO A LONG AND PRODUCTIVE RELATIONSHIP

So, you've just bought a brand-new Case IH Patriot sprayer. Now what, just jump in and drive? Not quite yet. If you want your machine to be dependable and last a lengthy and productive time, there are a few basic steps you need to follow.

The break-in period is a straightforward series of events. The steps outlined are for the Case IH 4420 and 3320 sprayers but they also apply to most sprayer models.

- As with any machine, you need to do the pre-start checks: oil, antifreeze, hydraulic oil, lights and so on.
- Once this is completed, start the machine and run at 1500 rpm until it is warm and ready to run. This is necessary because idling for extended periods of time could damage the engine.
- Now that the sprayer is up to operating temperature, it's time to begin the break-in procedure.
- For the first 20 hours, run the machine at a lower ground speed than you normally would.
- Make sure that the engine is throttled all the way up. But be sure not to overload the engine or the piston rings and cylinder bores may be damaged.
- After the first eight hours, re-torque the wheel nuts. Torque values can be found in the operator's manual or on the decal by the left front wheel. Re-torquing is the first step of breaking in the new machine.
- At this time it would also be a good idea to check the product strainers and remove any assembly debris or contamination.
- At the 50-hour mark, check the batteries and connections; also check the fan and air conditioning compressor belts for proper tension. Information on how to check this can be found in the operator's manual.
- Also at 50 hours, drain and refill the hubs with fresh oil. The specified oil can also be found in the manual. (NOTE: If the sprayer will be driven most often at maximum speed, you may want to install synthetic lubricant at this time.)
- When the sprayer reaches 100 hours, change the gear increaser oil. Also, change the engine oil and filter and the fuel filters. Finally, replace the primary and secondary air filters. Follow directions in the manual for changing these filters.

## <129...KNOW THE BASICS

and pause times to achieve the flow rate needed for the specific application.

AIM Command alternates the timing between neighbouring nozzles to provide spray overlap during spray pauses. The system is capable of locking on to a desired pressure, which allows the operator to specify a desired droplet size and select the tip and pressure to produce the average droplet and maintain it throughout varying speeds. This means that the pressure and droplet size are the same at 5 km as at 30 km per hour.

Operators can program two pre-set pressure points, and change pressure on the go from the cab at the flick of a switch, all without impacting the application rate or changing the sprayer speed. The end result is maximum chemical performance and crop coverage.

### Experience in the field

"With other systems, when you slow down for obstacles, you lose pressure and hence your application and chemical use isn't as even across the field as it should be," explains John Shadbolt, who runs a 12,000-hectare mixed cropping operation at Nungarin, near Mukinbudin in Western Australia.

"The AIM Command system on our two Patriot 4410s allows us to travel from 6 km right up to 40 km per hour at the same pressure, ensuring efficient coverage and chemical use."

For contractor Rob Boschen, one of the biggest benefits of AIM Command is its ability to deliver results. "We contract spray between Hamilton in Victoria and Hay in New South Wales and in our game, you have to make sure you provide a good service if you want follow-up work next season.

"So when we expanded our aerial spraying business to include ground spraying five years ago, we looked around for a system that would maintain consistent droplet size with varying speeds when operating in awkward shaped paddocks and around obstacles."

"Farmers won't always tell you if you're doing a good job – but you can usually tell if they're not happy. And given the fact that we have a great relationship with our customers, I'm pretty confident that AIM Command is effectively controlling weeds and thereby improving yields, which is critical to our business success."

The risk of spray drift is also reduced using AIM Command. "We spray within metres of vineyards in the Clare Valley, South

Australia so minimising spray drift is one of our principal concerns," explained David Maitland, who with his son, Jim, runs a 3000 hectare mixed cropping operation spread within a 30 km radius of Clare.

"And because Aim Command is fitted to a self-propelled Patriot 4410 that is capable of spraying at speeds up to 40 km an hour, we've been able to more than double our workload compared to previous machines. The end result for us is a more efficient operation and less worry at the end of the day about damaging neighbouring vineyard crops."

**Customers who place an order before 30 June 2008 can save up to \$18,500 on AIM Command. A free information package on AIM Command is currently available by calling Case IH on 1800 CASEIH (227 344).** ■

**The AIM Command system allows WA farmer, John Shadbolt, to travel at a wide range of speeds while maintaining consistent pressure and efficient chemical use.**



## NEW STANDARD FEATURES ON SPRAYERS

Patriot Sprayers built after mid 2008 will have the following features as standard.

**Accuguide Ready** – This system replaces the foam marker. Patriot sprayers will come equipped with the *Accuguide* hydraulic valve, steering sensor, brackets and machine wiring as standard, making the machines ready for easy installation of the full *Accuguide* system if required. This includes GPS receiver, AFS Pro 600 display and Navigation controller. *Accuguide Ready* also means that the Patriot sprayers built after mid-2008 are set up so operators can extract maximum value from existing *Accuguide* equipment they may have in a combine or tractor, by transferring the required components to the sprayer.

The operator can record their first pass through the field (being a straight line, curve or round and round) and the display will record the GPS positions throughout this pass. Once the pass is complete – and the operator completes the recoding – the display will generate identical paths, exactly the width of the sprayer boom, to the left and right of the current path all the way across the field.

The navigation controller then uses inputs such as the GPS position, front wheel steering angle and terrain compensation unit to automatically steer the machine down the created path to an accuracy as precise as two cm.

Unlike a foam marker, the *Accuguide* system will operate in all conditions including dust, fog, night time and warmer days when the foam evaporates. Fatigue is also reduced as the operator is not trying to follow a dotted line of foam blobs all day. This means more attention can be focused on other factors such as correct nozzle spray patterns and so on. Less fatigue means more time can be spent in the field which translates directly to more productive hours.

There is a general rule of thumb which suggests that manual guidance systems, such as foam markers, will result in around about a one metre overlap when operating a 36 m boom. This is an overlap of around three per cent which in turn means three per cent additional fuel, chemical, labour hours and so on.

The *Accuguide* system reduces this overlap to effectively zero.

**HID Deluxe Lighting Package** – Night spraying offers cooler and sometimes calmer application conditions for crop spraying to allow more applied chemical to reach the crop. But often the disadvantage of night spraying is the poor visibility. To help address this problem, CaseIH have added six additional High Intensity Discharge (HID) lights as part of a new lighting package across the Patriot range.

This package includes an HID light in the centre of the fuel tank hood, two HID lights in the front corner of the fuel tank hood, and four HID lights (two on each side) mounted on the rear corners of the cab roof. In addition to the HID lights, the standard halogen lights on the front cab corners, fuel tank hood, and standard boom lights remain on the post-June 08 models.

**AutoBoom height control** – This is new to the CaseIH range of sprayers and now standard on all Patriot 4420 sprayers. With the Aim Command system this means you can not only create the perfect droplet size at the nozzle tip, you can also ensure that the tip is the perfect distance from the crop for maximum canopy cover.

The *AutoBoom* height control consists of two (30.5 m boom) or four (36 m boom) ultrasonic boom height sensors which monitor the distance to the ground on the boom, and automatically adjust the wing tilt to ensure the unit is the correct distance from the ground while spraying.

The sensors use ultrasonic sound waves to measure the distance from the ground. The operator carries out a simple one-touch calibration to set the system up, and then they dial in the desired height and start operating. The *AutoBoom* system reads in the sensor heights and then by operating an electro-hydraulic valve, the system raises or lowers the boom wing to constantly achieve the desired height setting. )

Because the sensors are ultrasonic and not infra-red, they are not effected by light conditions and so can be used both day and night.

If needed, the system can be overridden by the manual boom positioning controls.

### More efficient spraying

The HID lighting package, *Accuguide* system and the *AutoBoom* height control are all features which add to the ability to carryout spraying in a wide range of conditions – particularly at night. Night time spraying presents cooler temperatures and less chemical volatilisation. And in most areas, night time spraying is generally associated with a cool breeze rather than the gusts which are often present in summer and autumn afternoons.

