



## Taking the mystery out of precision spraying

*Tully region growers Brian and Jamie Dore are integrating GPS technology with their spot spraying, delivering useful results. By Phil Ross, Adoption Officer, Mackay*

Jamie and Brian Dore farm in the Tully region and are active participants in Project Catalyst and the Federal Government's Game Changer program.

Both programs encourage and support growers to develop innovative and practical improvements to their farming systems, to improve profitability and improve water quality in adjacent waterways.

Brian and Jamie, with assistance from their agronomist Charissa Rixon (T.R.A.P. Services), have developed a system of creating a weed map as they spot-spray.

Jamie Dore says the system evolved out of the need to better control Hamil grass stools in ratoons. "Like other growers, we spend a lot of time spot spraying with a hand gun," he said.

"We also use a high-rise spray tractor to put down residuals and knockdown herbicides. Our high-rise is fitted with GPS and a variable rate controller so we thought that if we knew where the patches of Hamil grass were we could put down a higher rate of residual on these areas of high seed load."

Jamie says the system integrates GPS technology across the spot-spraying operation and the subsequent main spraying operation high-rise sprayer:

- The spot-spray tractor is set up to record the GPS coordinates of the spot-spraying:
  - > The hand-gun is fitted with a switch which triggers whenever the hand-gun is operated; and
  - > This signal is sent to the GPS unit which records the location of each spot-spray; the coordinates are stored in the GPS as a data file.
- This file is downloaded from the GPS unit onto a USB.
- This data file is then downloaded to a computer and a weed map is created using Trimble Farm Works™ Mapping and GIS (Graphical Information System) software.
- Using the Farm Works™ software, the identified hotspots of Hamil grass are prescribed a higher rate of residual herbicide than the remainder of the block; each logged point is currently expanded to a 20m buffer zone to ensure that enough of the higher seed bank is treated with the higher rate.
- The weed map is saved in Shapefile format which can be read by the controller in the high-rise tractor.
- After harvest, this file is then uploaded, via a USB, into the GPS/spray controller of the high-rise spray tractor.
- The operator selects the prescription relevant for the block being sprayed and the controller does the rest, applying either a higher rate or lower rate of residual herbicide to different parts of the block.

The change in rate is achieved by changing the water rate per hectare, at a constant travel speed. Jamie says that more sophisticated direct injection metering systems are available which would allow the amount of herbicide to be varied whilst maintaining a constant water rate; but they don't consider it economic to go to this level of technology yet. Direct injection metering systems are also more suited to liquid formulations of product and are not suitable for Wettable Granule or Dry Flowable formulations.

Although Jamie and Brian are very capable users of GPS and variable rate controller systems, they also use a consultant agronomist to set up their weed and nutrient plans. Charissa Rixon (T.R.A.P. Services) creates the weed maps from the spot-spray tractor's data file.

This requires a good knowledge of the Farm Works™ Mapping software and the GIS software, in this case Manifold®.

"I help Brian and Jamie decide on what herbicides to use and at what rate we'll apply them. Usually we'll have two rates programmed into the controller; a base rate and a higher rate where Hamil grass was mapped. Usually we'll use isoxaflutole (Balance®) at the out of hand stage in the ratoon crops from first ratoon onwards and then switch to imazapic (Flame®) immediately after harvest for the second ratoon onwards."

Because the farm is spot-sprayed each season, the distribution of Hamil grass infestations can be mapped from year to year. So we'll be able to see if we need to adjust the buffer zone where we are putting out the higher rate,

and we'll also be able to see if new infestations are occurring in areas that were free of Hamil grass previously," Charissa says.

This mapping technology is also used to develop nutrient plans. Nitrogen rates are varied across the farm using a twin compartment fertiliser applicator fitted with variable rate controller. At this stage only the N rate is varied with the second blend of other nutrients remaining relatively constant for the particular blocks being fertilised with that blend.

This innovation is supported by the Australian Government's Game Changer project, Terrain NRM and Project Catalyst.



**Images (clockwise from top left):**

The simple switch on the handgun triggers the GPS to log the point of spot-spraying.

The programmed controller on the high-rise now knows where to change the herbicide rate.

Ready for action.