

Take No Prisoners to Combat Herbicide Resistant Wild Radish!

Early detection of herbicide resistant weeds, a focused management strategy and being fastidious about controlling survivors is helping Victorian Mallee farmer Greg Martin get the better of herbicide resistant weeds.

Mr Greg Martin is currently attacking Group I herbicide resistant Wild Radish (*Raphanus raphanistrum*) that was found growing in a single paddock on his 5500 hectare farm located at Nandaly in the Victorian Mallee. In 2013 a suspected patch of herbicide resistant wild radish was identified and live plants surviving herbicide treatment were tested for resistance. The results confirmed low level resistance to 2,4-D and MCPA.

Mr Martin believes resistance evolved due to a lack of chemical group rotations & not enough importance given to controlling survivors.

Mr Martin's dryland property features sand/sandy loam soils and a typical annual rainfall of 300-400 mm on average. Grain production is the main enterprise and he has made a conscious effort over the past few years to diversify the cropping mix. This broadacre cropping approach provides farmers with a greater tool kit to battle weed resistance problems, creating more opportunities to use varied weed management tactics.

Over the past 10 years Mr Martin's enterprise has changed, moving to a no till system that involves a lot more cropping. Whilst this typically requires a greater reliance on chemical management of weeds, for wild radish it keeps the seeds closer to the surface - reducing their longevity and allowing faster management and eradication of a resistance problem.



Mr Greg Martin on his Victorian Mallee farm

Mr Martin and his agronomist Matt Elliott (Dodgshun Medlin) developed a 5 year targeted and integrated weed management plan to combat the herbicide resistant wild radish. Mr Martin believes consulting with his agronomist will be key for him to successfully eradicate resistance: "They have a proven record of dealing with this problem on other farms so we consulted with them and formulated a plan to get on top of the problem." He expects it will take a minimum of five years to get the resistance problem under control. Control may occur sooner but he is mindful to not relent too soon.

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Since the discovery of herbicide resistant wild radish on Mr Martin's farm there is now an emphasis on rotating herbicide chemical groups, managing survivors and integrated weed management. Making use of alternative cultivation practices where possible, such as narrow windrow burning and spray toping in the legume phase, has also been included in the management plan. These tactics have been selected as the farmer feels it is important to use as many different control options as possible.

“Mindset is important; test and identify the scale of your problem, get a plan and get stuck in! Maybe with hindsight we danced around the problem for too long”.

Incorporating Triazine Tolerant (TT) canola into the crop rotation is the primary strategy in place to defeat the resistant wild radish. “There was a heavy reliance on Clearfield cereals in the rotation and another chemical group was needed to control radish in the break crop phase of the rotation” said Mr Martin. “Radish has also shown group B resistance so the use of Atrazine (group C) has given us a greater level of weed control within the crop.” Finding paddocks without a history of group B herbicide use in which to grow TT canola can be a stumbling block for this approach and here accurate farm management records are advantageous.

In the season after resistance was confirmed, TT canola was grown in the problem paddock. This proved to be a good first step for Mr Martin's management program with the group C herbicide providing effective control of all wild radish growing in the paddock that year.

“We are entering the second year of a five year management plan and the new strategies appear to be successful in getting the resistance problem under control”

Mr Martin also carefully considered his approach to harvesting his canola, creating narrow windrows of straw and chaff to burn. It is not surprising he chose this narrow windrow burning strategy considering how well it has worked in WA to reduce wild radish seed banks and overcome resistance problems.

Tactics to combat spread of the resistance by preventing seed set are also in place.



Wild radish invading a cereal crop. *Photo by Peter Boutsalis*

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“To kill any late germinating radish plants that may emerge after the first spray we are using a Double Knock strategy; killing every plant that germinates that year equals a reduction in numbers and reducing their spread” said Mr Martin. In 2015 the paddock will be returned to wheat and the control of wild radish monitored vigilantly.

“We are also taking a no prisoner approach to any seed that hits the ground by controlling weeds in non-cropped areas, including fence lines. This reduces their numbers using chemistry that is not used in the crops” Mr Martin highlighted. The main complication with this tactic is timing of herbicide applications as radish can germinate at all times of the year.

As the resistance problem was localised to one paddock the management plan was specific to that area. However, dealing with this problem has increased Mr Martin’s awareness and positively altered his attitude towards weed management for his entire enterprise.

The lesson was to make weed management a high priority; vary the control tactics, monitor treatment performance & be prepared to make management changes early.

Mr Martin also points out that all of his resistance control measures have come at a greater financial cost. “Economic circumstances are an issue that should not be underestimated. Realising you are developing a problem yet having the means to act accordingly could be an obstruction.” However, he deems the additional expenses incurred from a comprehensive weed management strategy are justified. Mr Martin declares “We can see that controlling our problem is going to come at a cost to the business but also realize that for us to do nothing, and let the problem intensify, is going to eventually lead to a problem that is so massive it could ultimately make us unviable. Short term pain for long term gain!”



Wild radish flowering in canola crop. *Photo by Peter Boutsalis*