

# Hand weeding of wild radish – sometimes cheaper than spraying

Peter Newman, Leader of communications, Australian Herbicide Resistance Initiative

## Summary

With an ATV and a full work day, teams of two people could hand weed 100 to 150 ha per day at a cost of \$2.50 to \$4/ha if the wild radish density is 5 plants /hectare or less.

This is a viable option for paddocks with very low weed densities. It may even be an option to spray paddocks with moderate densities with cheap herbicides and then hand weed the survivors.

Drones and in-crop weed detection will play a big role in weed control in the future. In the mean time we will have to settle for good looking young backpackers!

## The problem

The floral emblem of the shire of Geraldton is a wild radish flower, so surely hand weeding of wild radish is impossible. As it turns out, where growers have put their mind to it and smashed the wild radish seed bank for a decade or more, some paddocks had wild radish numbers low enough to hand weed economically.

In this short term project funded by GRDC through the Geraldton RCSN, we set out to develop a technique for assessing the wild radish density at which hand weeding was more economical than spraying. Three paddocks were hand weeded.

Paddock	Area	Number of Wild Radish	Wild radish /ha	Time spent weeding	Area weeded / hour	Cost / ha
1	10.5 ha	275	26	5.5 hours	1.9 ha	\$39
2	80 ha	182	2.3	5.5 hours	14.5 ha	\$5.15
3	9.6 ha	930	97	6.5 hours	1.5 ha	\$51

End result – hand weeding wild radish is feasible if you can pick the right paddock with a low enough weed density. The trick is picking the right paddocks!

The wild radish in the northern cropping region of WA is extremely resistant, but in most cases the crops are now very clean. Most growers have targeted the radish seed bank for a decade or more through crop and herbicide rotation, robust herbicide mixes, narrow windrow burning, and the attitude that wild radish should never be allowed to set seed.

Most growers say the same thing, 'my radish numbers are low, but the last few radish are costing me a fortune to control'.

We need a technology to control these low densities without it costing us an arm and a leg.

The growing conditions were perfect for low radish numbers in crop near Geraldton in 2015. Lots of summer rain providing a good knockdown and early seeding opportunity followed by dry conditions in May to limit radish germination in crop.

When the wheat crop was at the 2 to 3 leaf stage, growers did what they do every year – drive over the crop and plan their post-emergent wild radish spray. But this year was

different, many of them could scarcely find a wild radish plant. Some paddocks simply were not worth spraying.

But

The growers were scared not to spray. They had just spent a decade getting their seed bank down and they didn't want to undo their hard work.

### **Hand weeding is old school**

We are hearing speculation that weed detection in crop is just around the corner – but we are ready for it now! This project aimed to determine if hand weeding is a viable option while we wait for weed detection technology.

The GRDC responded quickly by funding a small one year study through the Geraldton RCSN to determine how to assess which paddocks were candidates for hand weeding, and was if it economically viable.

#### **Step 1: Assess**

Three paddocks were assessed in August by driving 1 to 1.2km at 10 km/h through tillering wheat crops and visually assessing an area 3.5m either side of the vehicle. This was done by driving down a spray tramline with a person on either side of the vehicle looking out of the window.

<b>Paddock</b>	<b>Distance driven in crop</b>	<b>Radish count per 7m x distance driven</b>	<b>Estimated radish density /ha</b>	<b>Actual radish density/ha</b>
<b>1</b>	1km	7	8	26
<b>2</b>	1.2km	1	1.2	2.3
<b>3</b>	1.2km	26	31	97

Our assessment of paddock 2 was relatively accurate and this was a good result. In paddock 1 there was an area of high wild radish density near a fence which made the early assessment inaccurate resulting in high cost and poor time efficiency. In paddock 3, the transect that was assessed turned out to be accurate. The estimated density of that transect was 31 radish/m<sup>2</sup> and the actual density was 37 radish/m<sup>2</sup>. However, the rest of the paddock was much weedier than this transect, hence the difference between the early assessment and the actual radish density.

#### **Step 2: Find some backpackers**

An advert was posted on the jobs board at the local backpackers in Geraldton and we had our hand weeding team a few hours later. Backpackers get a 1 year visa. If they do 88 days of agriculture related work in that year they can apply for a second year. They are hungry for the work.

Stuart McAlpine from Buntine has used Gumtree to advertise for backpackers to hand weed radish in recent years. He regularly receives 100 to 150 responses to his ads. His tip – don't leave your mobile phone number on the ad, the thing won't stop ringing!

#### **Step 3: Drop the backpackers in a big crop in the middle of nowhere and tell them to pull out the weeds.**

We supplied them with a vehicle, hat, long sleeves, gloves, plenty of sunscreen, water, Aeroguard, and \$25/hour. Wild radish with large pods were removed entirely from the

paddock. Wild radish with only flowers and immature (pencil lead) pods were pulled out and left in the crop.

The team of three worked together with a driver and two pickers. They drove down boomspray tramlines and walked into the crop from there to remove radish.

### **What we learnt**

1. This is a viable practice where wild radish density is approximately 5 to 10 plants / hectare or less. At very low densities this practice is both economically and logistically feasible.
2. A side by side all terrain vehicle (ATV) with a trailer would be ideal. With this equipment, teams of two could work together with the driver picking radish given the ease of stepping into and out of these vehicles. This would reduce the cost and make life easy and safe for the workers.
3. Spray a boundary lap and any areas where high density is expected. We encountered high radish densities near the edges of paddocks which slowed down the process and increased the cost. These sprayed areas can also be hand weeded to remove resistant survivors.
4. Spend time assessing the paddocks. We managed to make accurate wild radish density assessments in one paddock. The problem was that we didn't do enough assessment and we were faced with surprises in the other two paddocks.
5. Drones /weed detection will have their day. We have un-sprayed paddocks that now have as few as 2 wild radish per hectare in crop. It is simply not worth spending upwards of \$25/ha to spray these crops not to mention the environmental issues. These paddocks are currently rare but they show what is possible.

### **Acknowledgements**

GRDC for supporting this project through the Geraldton RCSN and their ongoing support of AHRI.

Peer reviewed by Prof. Steve Powles