



Irrigation Research &
Extension Committee

2020/2021 IREC Weeds Control Trials

Agriculture Trials with an Agronomic Focus

An Area Wide Management of Weeds Project trial targeting fleabane and annual ryegrass, to help reduce seed spread off and along channel banks in the MIA.

Technical Questions

1. Is Kikuyu grass a good preventative of fleabane and ryegrass establishment along channel banks?
2. How far is fleabane and ryegrass travelling on land off channel banks?
3. How effective is Kikuyu in comparison to chemical control?



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1. Summary

Over the course of 6 months, September 2020 – March 2021, 3 trial sites were established and monitored for the tough to control weeds, Fleabane and Annual Ryegrass.

Turf Trial – the use of lawn to suppress weeds

Citrus Trial – the use of residual herbicides

Movement in Farm Trial – monitoring weed movement off channel banks

To determine the movement of weeds off channel banks is reliant on the consistency of events such as;

- channel movement
- farm hygiene
- mechanical use
- chemical control
- weather

Turf along channel banks has the potential to suppress and reduce the movement of weeds. It has the capability of surviving extreme weather conditions, will continue spreading along banks and obtain water from the channel for self-management.

Residual herbicides are a major weed controller. To apply residual herbicides on farm with a turfed channel bank may see a major effect on weed suppression.

2. Introduction

The Irrigation Research Extension Committee is part of an area wide weed management project that is looking at tools and techniques to manage the tough to control weeds, Fleabane and Annual Ryegrass.

A total of 3 sites were established to demonstrate the control of weeds on channel banks and orchards to reduce the incidence and spread of these weeds in a commercial sense, as well as get a better understanding of how they behave.

MI Channel Bank – Located in Nericon, Kikuyu turf and seed placed along the channel banks to monitor the incidence and spread of tough weeds, particularly fleabane and ryegrass that are commonly spread in water onto farms.

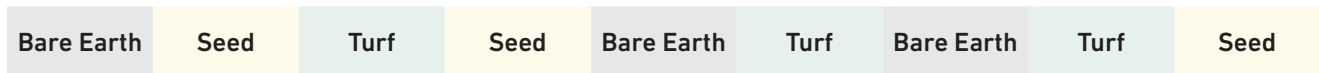
Murrumbidgee Irrigation has over 6,700km of channel banks (between supply and drainage channels) and buffer zones. It is difficult, costly and time consuming to control weeds on these banks and buffer zones and for neighbouring properties, this is often the source of weed seed and where a lot of resistance issues stem/spread from.

Citrus Farm – Located in Cudgel, implemented 4 different herbicide treatments for weed control targeting difficult to control weeds, annual ryegrass and fleabane. Finding safe and effective residual controls are key for managing weeds long term and reducing the risk of herbicide resistance.

Prune Farm – Located in Griffith, monitoring the movement of weeds travelling into farms off the channel banks. The channel had a section of established lawn and a section of bare earth (roadway) that provided a competition free area for the weed seeds to spread from.

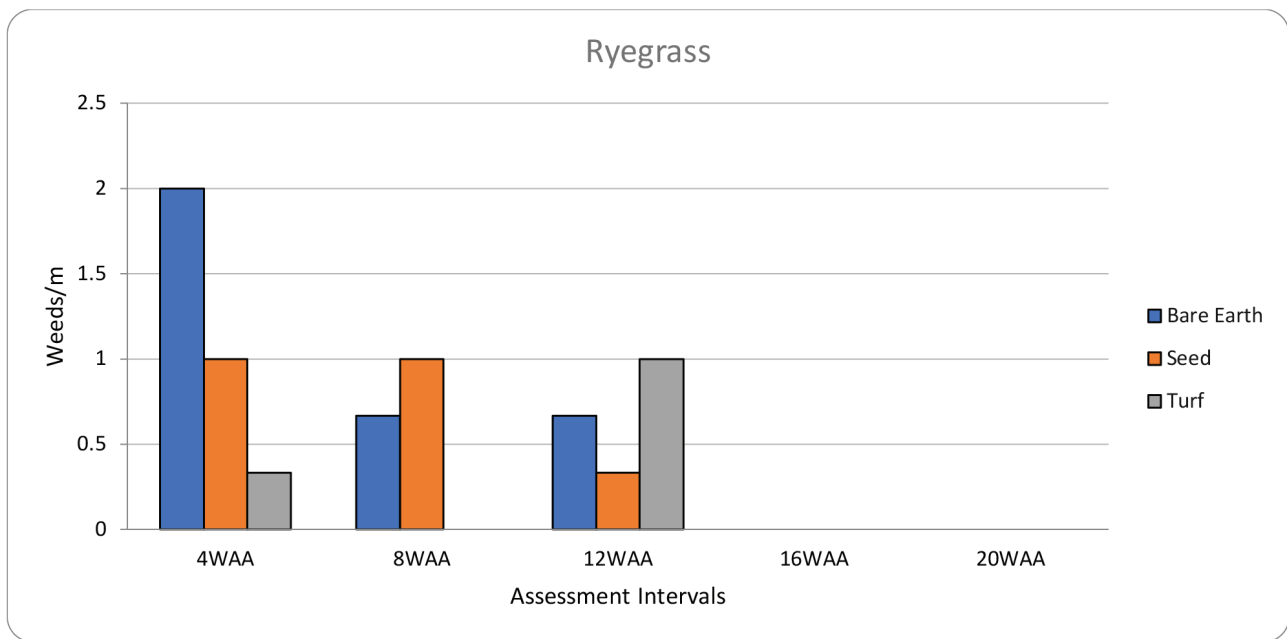
3. MI Channel Bank — Kikuyu Establishment

11th September 2020 Kikuyu seed and turf was applied along main MI channel banks to assess the control of tough weeds, namely Fleabane and Annual Ryegrass.



Above: Randomized layout of trial

Assessments were conducted at monthly intervals. Annual ryegrass was present at commencement of trial and declined by final assessment. Fleabane was not present throughout the trial period.



Above Graph: Presence of ryegrass/m

Ryegrass is a naturally winter dominant weed species, and this can be seen in the data above, with the weed pressure dropping off as we moved into the summer period. Due to the heat of the summer and the fact that the turf and seed were left to be watered naturally from the channel the seed did not take at all, the turf did but was slow to grow. There was no significant differences in the ryegrass populations, with the overall population being so low. There was no fleabane observed at the site.



Above Images: Early Assessments – Left Turf – Middle Seed – Right Bare Earth



Above Images: Late Assessments – Left Turf – Middle Seed – Right Bare Earth



Above Images: Captured in May 2021 outside of trial period – Left Turf – Right Bare Earth

As can be seen above the site was assessed in May after the completion of the trial with the turf having progressed significantly since the previous summer and the bare earth and seeded treatments having no competition at all. It could be worth continuing to monitor this site over the coming months to look at weed population now the turf is better established.

4. Citrus Farm — Controlling Fleabane and Resistant Ryegrass

The use of residual chemistry of citrus farms is not as common as expected, which puts pressure on non-selective herbicides such as Glyphosate to manage these. This brings with it the risk of having resistance build up over time due to over reliance. In co-operation with a local farmer that had a high population of Ryegrass present, a residual trial was developed.

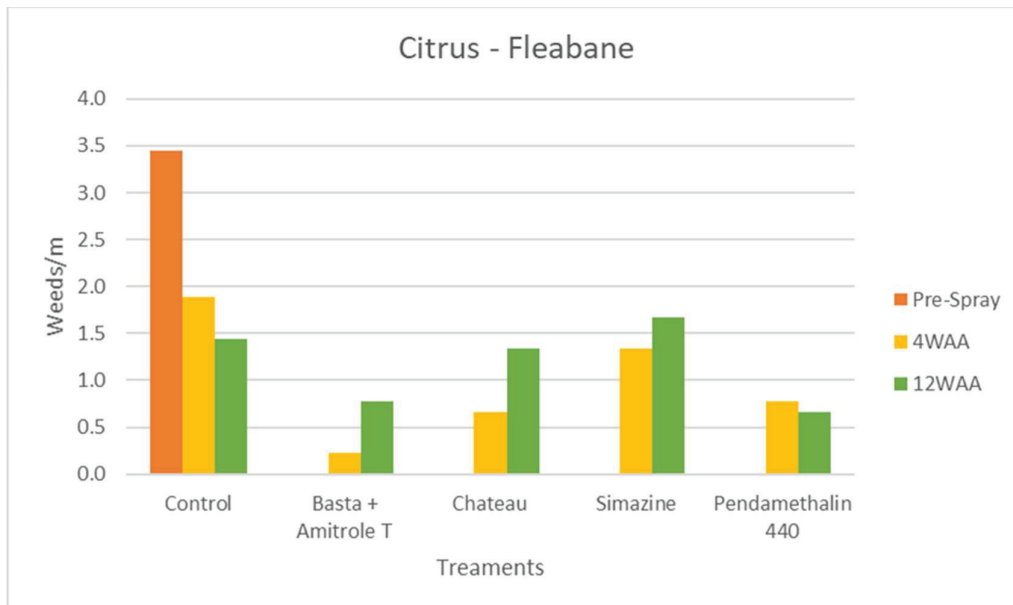
A randomized trial design containing 4 treatments and 1 control plot replicated 3 times. Each treatment was applied by hand boom using grower standard rates.

Control	Basta 0.5L/100L + Amitrole T 2L/100L	Chateau 0.7kg/ha	Simazine 2.5kg/ha	Pendamethalin 440 6.75L/ha
101	102	103	104	105
Pendamethalin 440 6.75L/ha	Simazine 2.5kg/ha	Control	Chateau 0.7kg/ha	Basta 0.5L/100L + Amitrole T 2L/100L
201	202	203	204	205
Basta 0.5L/100L + Amitrole T 2L/100L	Chateau 0.7kg/ha	Control	Pendamethalin 440 6.75L/ha	Simazine 2.5kg/ha
301	302	303	304	305

Above: Layout of trial site

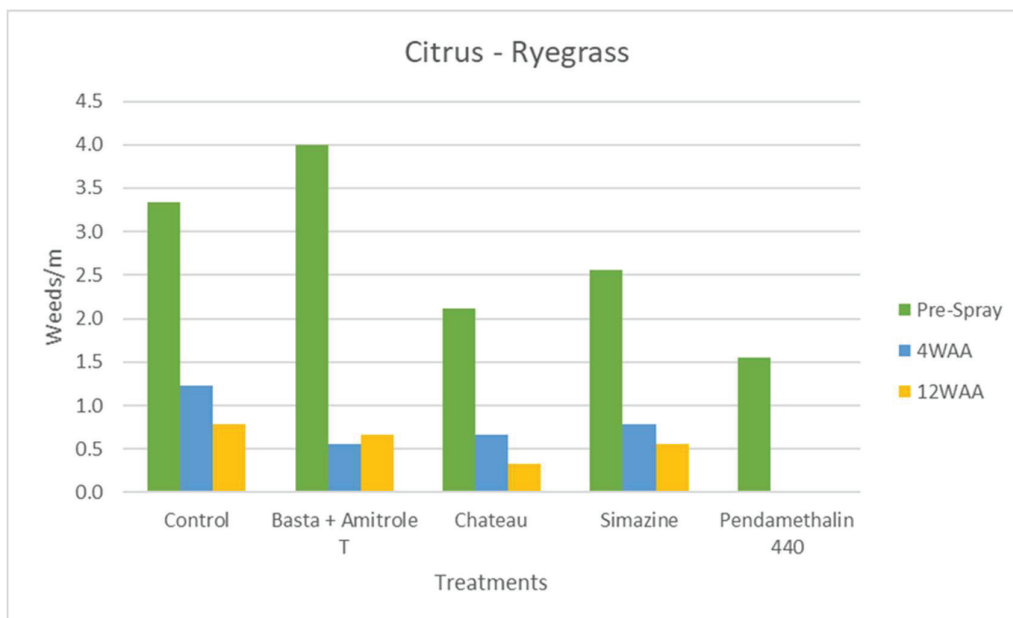
Young orange trees were used, the site was sprayed out and then the residual herbicides applied in an effort to get a much bare earth contact as possible. The weeds were assessed pre spraying, 4 weeks post application and 12 weeks post application.

Sprays were conducted on the 6th of November using a hand boom in a 6m x 30m (0.018ha) plot replicated 3 times in each treatment and the average number of plants seen in the following tables.



Above Graph: Fleabane/m

At the first count there were only fleabane plants present in the untreated control plot. There was a subsequent germination after this initial count with the basta and amitrol having the lowest germination at 4 weeks after application but the number of plants increased at 12 weeks after application. The chateau was the next best but followed the same trend with the simazine having the highest population of all of the treated blocks. The Pendamethalin was the only treatment that had a reduction, although not enough to be significant.



Above Graph: Ryegrass/m

The ryegrass population was much more evenly distributed throughout the plots with the natural mortality leading into the summer reducing the population, as seen in the control. The Pendamethalin was once again the best treatment with there being no surviving ryegrass at 4 or 12 weeks after application. The basta and Amitrole produced the best visually, they had the least residual control.



Above Images: Treatment 2 - Basta + Amitrole T – Left Pre-Spray and Right Post-spray



Above Images: Treatment 5 - Pendimethalin – Left Pre-spray and Right Post-spray



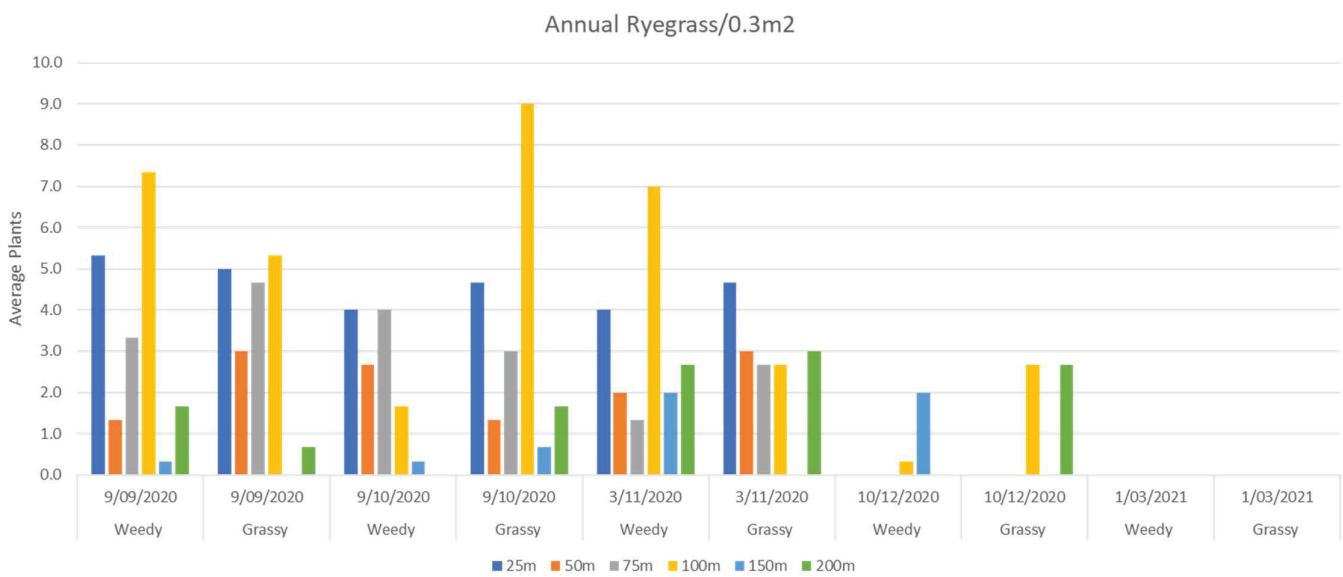
Above Images: Untreated – Left Trial Commences – Right Trial Ceases

5. Prune Farm — Impact of Established Kikuyu on weed movement

From the channel bank markers placed at 25m intervals to assess the movement of weeds into farms off channel banks. Annual ryegrass decreased over the course of the trial; fleabane was not present.

	25m	25m	25m	25m	25m	25m	25m
	50m	50m	50m	50m	50m	50m	50m
	75m	75m	75m	75m	75m	75m	75m
	100m	100m	100m	100m	100m	100m	100m
	150m	150m	150m	150m	150m	150m	150m
	200m	200m	200m	200m	200m	200m	200m
Road in	Weedy/Road			Grass			
	B3	B2	B1	G1	G2	G3	

Above: Layout of markers to assess weeds.



Above Graph: Annual ryegrass/0.3m² travelling between 25m & 200m.



Above Images: Various assessment timings, left the grassy bank, middle in the prunes, right, the weedy bank.

6. Conclusions

Turf Trial – the use of lawn to suppress weeds is an interesting concept and not one that we really got a good understanding of during this trial time period. Laying turf was definitely much more successful than the use of lawn seed and not as labor intensive as anticipated. There is definite weed suppression but further observations of the area would be needed to get a full understanding.

Citrus Trial – the use of residual herbicides offers a great alternative to relying on non-selective knockdowns such as glyphosate. The treatment of pendimethalin provided the best continued control of both the weed species of interest, followed by Chateau. They are both great options for providing good residual control in the permanent cropping situations.

Established cover on channel banks – there was no real trend picked up as expected. The layout of this trial wasn't perfect and it would be interesting to do where the tree lines run perpendicular to the banks so that roads or tree lines could be consistently monitored. In this situation there was no benefit seen from the coverage on the banks and the movement of ryegrass into the orchard.

Annual Ryegrass is a winter dominant weed, to monitor the control methods during the summer period does not see fit as the heat is a natural suppressant of ryegrass. To extend research on ryegrass control it would be suggested to monitor closer to the winter months.

Fleabane has the opposite growth pattern to ryegrass, to monitor during the summer months was ideal once germinating from dormancy.

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