



TALINOR® HERBICIDE PLANTBACK EVALUATION TRIAL

Beelbangera 2018

INDEPENDENT AGRONOMY ADVICE + CUTTING EDGE RESEARCH

Talinor® & Competitor Plantback

KEY POINTS

- Drought conditions have been experienced in 2018 with the season characterised by high temperatures and low rainfall. Rainfall for Griffith for 2018 till the end of August was 89.4mm, compared to the long-term average of 263.6mm, with the site having 87.5mm of rain.
- The trial was set up to provide a comparison for plant backs of commonly used herbicides against Talinor®, a Syngenta product released commercially in 2017, across a range of broadleaf crops.
- The trial had low rainfall, however the 216mm that fell from herbicide application to planting was enough to satisfy the Lontrel™ Advanced Label plantback rainfall requirement for the lower rate (150mm for rates under 150 ml/Ha). This was within the 9 month timeframe stipulated on label.
- Crop safety is of high importance as often crops do not recover from early setbacks. The Talinor® residual from 2017 did not cause commercially unacceptable crop damage. However, Lontrel™ Advanced and Group B carryover did cause unacceptable crop damage – even, in some instances, 150 ml/Ha Lontrel™ Advanced.

BACKGROUND

Talinor® is a post-emergent herbicide developed for the control of hard to kill broadleaf weeds, such as fumitory and volunteer pulses and has strong activity on wild radish and Indian hedge mustard, in wheat and barley. Talinor® combines two herbicide modes of action (Group H & C), containing 37.5 g/L Bicyclopyrone + 175 g/L Bromoxynil.

It presents an opportunity for growers to achieve satisfactory weed control while potentially minimising herbicide residual, thus keeping their rotation open. It also presents an opportunity for irrigators to control hard-to-kill broadleaf weeds with minimal residual to cotton (4 months).

This is of huge benefit to the cotton/wheat system, and across the industry, with potential rotational benefit to all growers if plant-backs prove to be minimal, while still providing strong control of broadleaf weeds.

Talinor® has the added advantage of not relying solely on translocation in its activity within the target plants, which may make this product more attractive in conditions of lower rainfall.

It is an alternative to the use of herbicides such as Velocity® or Paradigm™ and is a very competitive product in this space. This is due to Talinor® allowing for the possibility of a reduced residual while still maintaining effective control of broadleaf weeds such as rough poppy, wild radish or fumitory.

TRIAL DETAILS

In August 2017 a trial was established at "Ridgetop" Beelbangera, 16km NE of Griffith, in a Scepter wheat crop in conjunction with Syngenta. The objective of the trial was to see how crop safety of a following pulse crop, sown in 2018, compares after the use of various herbicides, including Talinor®.

12 treatments, including an untreated control, were applied to the wheat crop on 20th August 2017, Table 1. The crop was at the third node stage (GS33) when sprayed, which was a bit later than ideal, but the crop was sown at 18 kg/ha and there was good spray penetration to the ground, figure 1.

The herbicide treatments were boom sprayed, using a 6m wide boom mounted onto an ATV, and were applied at 8 km/hr, with a water volume of 80 L/ha. The trial site was then managed as per commercial practice for the remainder of the 2017 season.

The trial was set out in a randomised complete block design and treatments were replicated two times, with plot sizes of 1.75m x 20m (35m²). The trial was sprayed from 10am to 1pm, after a heavy frost with a minimum morning temperature of -4.5°C. The environmental conditions at the time of application were 12°C temperature, 60% relative humidity, and wind speed 7km/hr.

Table 1: Herbicide Treatments applied to the wheat crop in 2017 and product list.

NO.	TREATMENT	PRODUCT RATE	PRODUCT RATE
		(gai/ha)	(mL or g/ha)
1	Untreated Control	---	---
2	Talinor® + Adigor	(37.5 + 175)	1000 + 0.5%
3	Talinor® + Adigor	(75 + 330)	2000 + 0.5%
4	Velocity® + Hasten™	(37.5 + 210)	1000 + 0.5%
5	Velocity® + Hasten™	(75 + 420)	2000 + 0.5%
6	Paradigm™ + Uptake™	(5 + 5)	25 + 0.5%
7	Paradigm™ + Uptake™	(10 + 10)	50 + 0.5%
8	Lontrel™ Advanced	90	150
9	Lontrel™ Advanced	180	300
10	Ally® + BS1000®	4.2	7 + 0.1%
11	Ally® + BS1000®	8.4	14 + 0.1%
12	Rexade™ + BS1000®	(15 + 5)	100g + 0.1%

PRODUCTS:

Talinor®

Velocity®

Ally®

Lontrel™ Advanced

Paradigm™

Rexade™

Adigor®

Hasten™

BS 1000®

Uptake™

Active Ingredients

37.5 g/L Bicyclopyrone +175 g/L Bromoxynil

37.5 g/L Pyrasulfotole + 210 g/L Bromoxynil

600 g/kg Metsulfuron-methyl

600 g/L Clopyralid

200 g/kg Halauxifen + 200 g/kg Florasulam

150 g/kg Pyroxsulam + 50 g/kg Halauxifen

440 g/L methyl ester of canola oil

704 g/L ethyl & methyl esters of vegetable oil + 196 g/L NIS

1000 g/L non-ionic surfactants

582 g/L Paraffinic Oil + 240 g/L Alkoxylated NIS

Figure 1: Treatments applied to wheat crop at GS33 - 20th August, 2017.



Eight broadleaf crops were then sown across the herbicide treatments the following year on the 22nd May, 2018, figure 2.

These crops included:

1. Bonito Canola,
2. Ace Lentils,
3. Sturt Field Peas,
4. Samira Faba Beans,
5. Boundary Chickpeas,
6. Rasina vetch,
7. Aurora Lupins and
8. Kayla Lupins

The rotational crops were sown as per commercial practice with the pulse crops inoculated with the correct strains of rhizobia and with 80 kg/ha MAP, with the exception of the lupins, which was sown with 30 kg/ha of superphosphate.

Stubble was retained at this site and was not mulched or burnt, other than a windrow burn. The site has low organic matter, and the 2017 wheat crop yielded 0.74 t/Ha.

Figure 2: Sowing broadleaf rotational crops - 22nd May, 2018.



RESULTS AND DISCUSSION

The 2018 season was a dry one, with the total rainfall from the application of treatments in August 2017 to sowing in May 2018 being 216mm.

Growing season (1st April – 30th September) rainfall for 2018 was well below average, with 68.5mm rainfall at the trial site, compared to the long-term average of 199.2mm for Griffith.

The low rainfall meant that microbial activity for breakdown of these products was minimal, however plant growth was also suppressed due to this.

The dry conditions impacted on symptoms expressed by plants, such as stunting, yellowing and leaf cupping, with careful observation conducted to determine if the symptom was a result of the phytotoxicity expressed by the plant in response to the treatments, versus stress expression due to the dry conditions.

Evaluations were conducted in 2018 in the specified rotational crops planted after the cereal in which the herbicide was applied.

Crop safety was evaluated 28, 42 and 70 days after emergence (DAE), with plants/m², NDVI, crop vigour reduction and crop phytotoxicity all evaluated.

Establishment - Crop stand count (28 DAE):

The crops took a long time to establish, after a very dry start to the season, with emergence on 27th June, 2018.

The first measurements were taken 24th July (Figure 2). The lowest plant counts were taken from chickpeas on 300 ml/Ha Lontrel™ Advanced, with only 10.7 plants/m² (Figure 3).

Lucerne had the highest plant counts across most treatments, but it was also the least vigorous crop until 70DAE.

Figure 2: Crop Establishment - average plant counts (plants/m²) for each treatment, taken 24th July 2018.

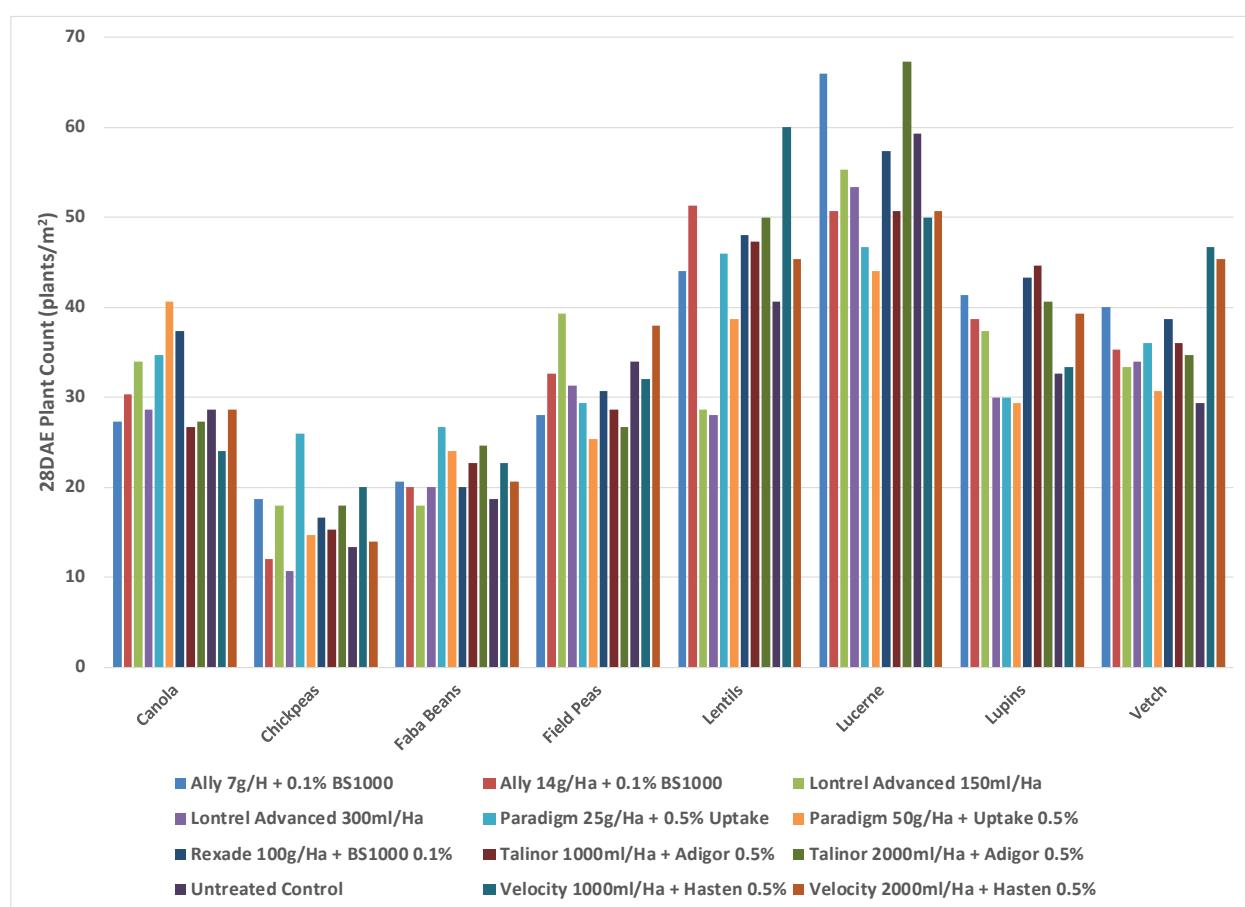


Figure 3: Establishment of chickpeas (left) and lucerne (right) on 300 ml/Ha Lontrel™ Advanced, taken 24th July 2018.



NDVI (% of the untreated control) - 28, 42 and 70DAE:

NDVI measurements were taken as an average of each individual plot. Variation, resulting from paddock history, as well as from the dry season, made some measurements difficult.

The NDVI biomass measurements were expressed as a percentage of the untreated control (with the untreated control expressed as 100% in all cases). The lowest measurements were from 42DAE & 70DAE.

28DAE: At 28DAE, the only measurements that recorded lower than 95% of the control were from Lucerne and canola, with 25 g/Ha Paradigm™ giving 93.33% of the control for each and lupins which recorded 94.28% on 100 g/Ha Rexade™ (Figure 4).

42DAE: Lentils at 42DAE recorded lowest, at 74.24% for 150 ml/Ha Lontrel™ Advanced; 76.84% for 50g Paradigm™ and 76.84% for Velocity® 2000 ml/ha (Figure 5).

Talinor® results rarely fell below 90% of the control, and in the instances where it did the results were 88.42% (faba beans) and 83.77% (lentils and lupins) for 1 L/Ha Talinor® at 42DAE.

The biomass as a % of the untreated control read higher in the 2 L/Ha Talinor® treatment. Chickpeas, however, recorded 88.54% for 2 L/Ha Talinor®, which was the same reading as the Rexade™ treatment on chickpeas at 42DAE.

70DAE: At 70DAE, Faba beans were 78.47% of the control for the 150 ml/Ha Lontrel™ Advanced treatment; Lucerne was 73.91% of the control for the 25 g/Ha Paradigm™ treatment, and lupins were 71.52% of the control for the 25 g/Ha Paradigm™ treatment (Figure 6).

Figure 4: NDVI expressed as a percentage of the Untreated Control (UTC) at 28DAE, on 24th July 2018.

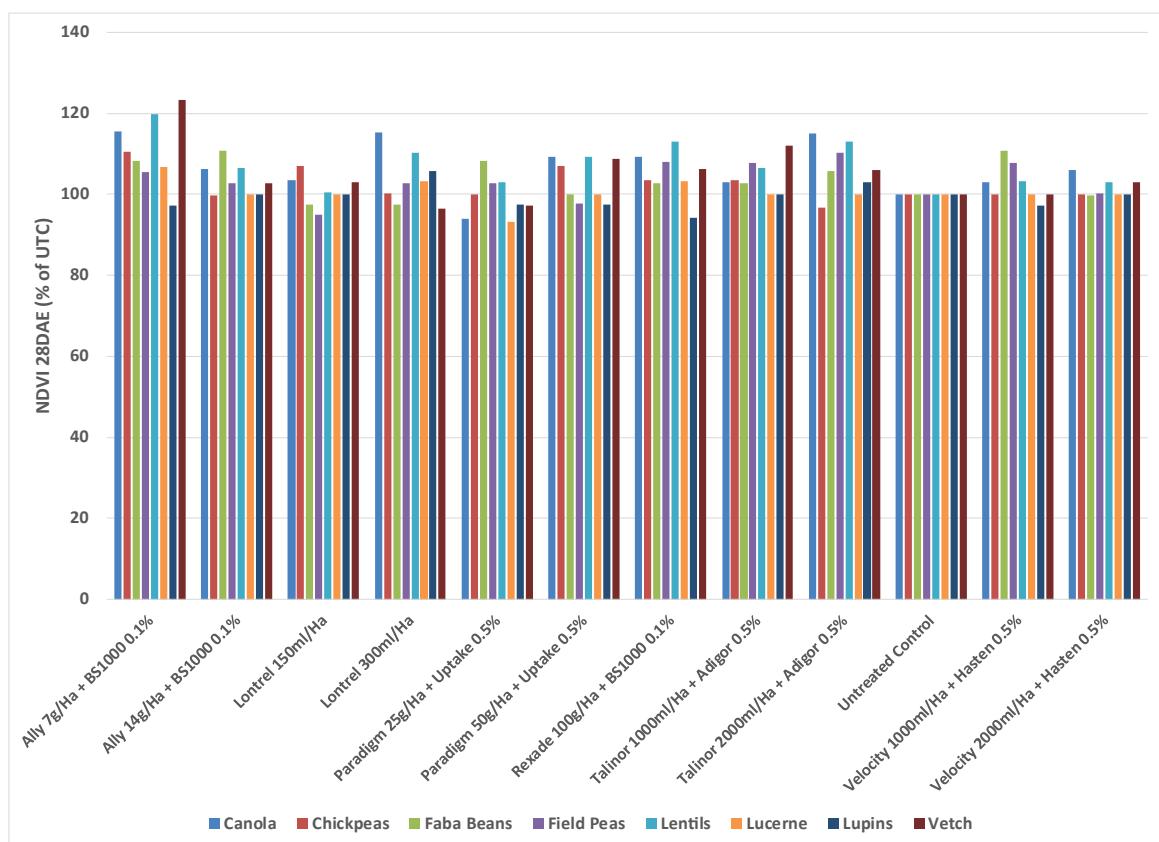


Figure 5: NDVI expressed as a percentage of the Untreated Control (UTC) at 42DAE, on 7th August 2018.

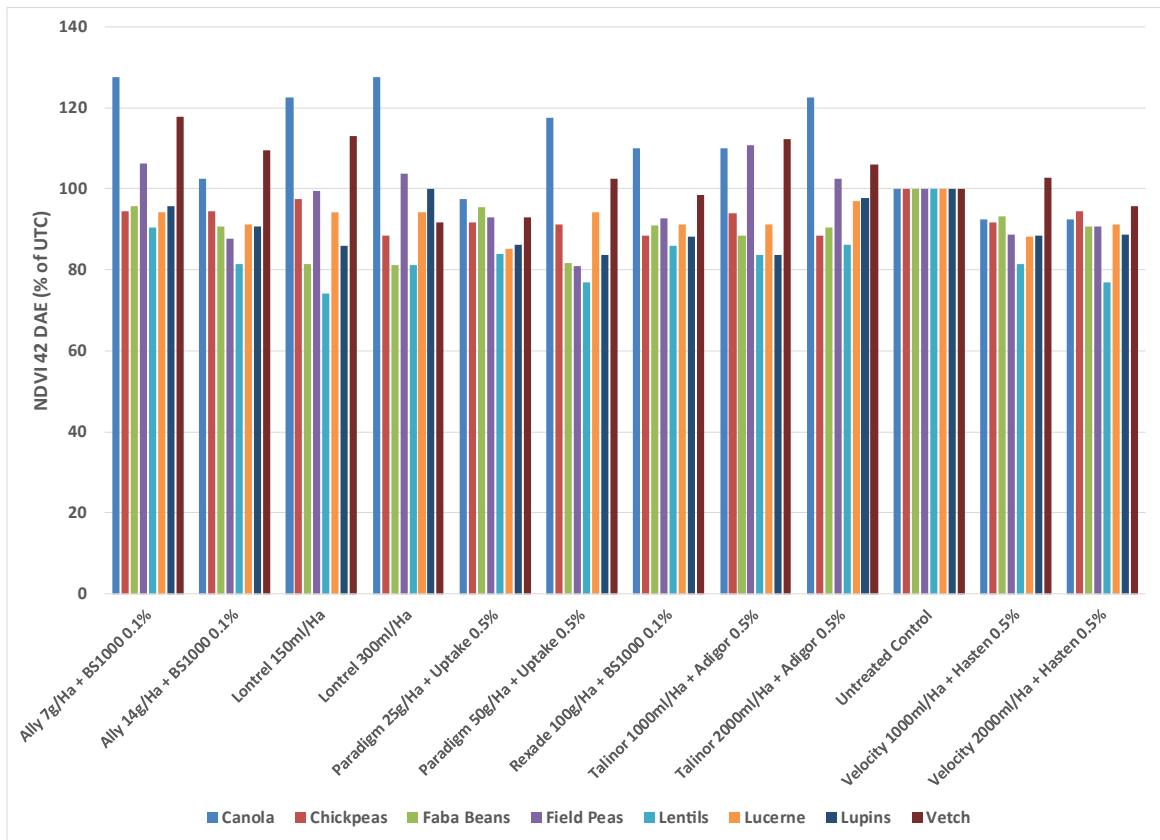
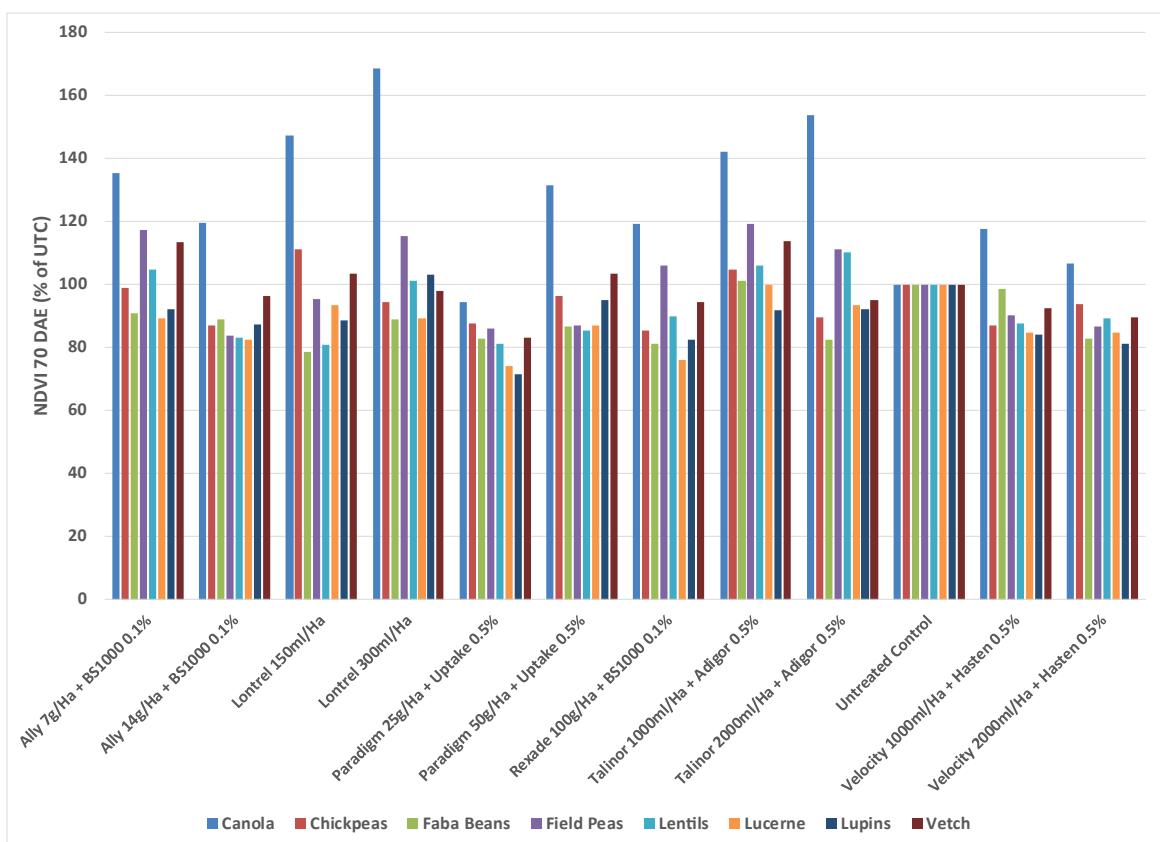


Figure 6: NDVI expressed as a percentage of the Untreated Control (UTC) at 70DAE, on 4th September 2018.



Crop vigour reduction (%) - 28, 42 and 70 DAE:

Vigour reduction percentage (%) was a visual crop assessment compared to the untreated control, expressed as a percentage (%) reduction, where the untreated control was 0% vigour reduction. The Group B chemicals presented symptoms such as yellowing, leaf burn, distortion, sick growing points, necrosis, biomass reduction, purpling, and a patchy or delayed emergence.

28DAE: At 28DAE, lentils had the biggest vigour reduction at 30% and 40% for Lontrel™ Advanced at 150ml/Ha and 300 m/Ha respectively (Figure 7). Chickpeas had a 12.5% reduction for 300 ml/Ha Lontrel™ Advanced, and faba beans had a 10% reduction for both 300ml/Ha Lontrel™ Advanced and 50g/Ha Paradigm™.

42DAE: At 42DAE, vigour decreases up to 30% and 40% for lentils on 150ml/Ha and 300ml/Ha Lontrel™ Advanced respectively were recorded (Figure 8). For canola, there was a 10% reduction for 14g/Ha Ally® and 25g/Ha Paradigm™; for faba beans there was a 10% reduction for 300ml/Ha Lontrel™ Advanced and a 12.5% reduction for 50g/Ha Paradigm™. Field peas had a 17.5% reduction for 14g/Ha Ally®; 15% for 50g/Ha Paradigm™ and 10% reduction for both 7g/Ha Ally®, 1000ml/Ha Velocity® and 150ml/Ha Lontrel™ Advanced.

70DAE: At 70DAE, the treatments which expressed the greatest vigour reduction were 14g/Ha Ally®, Paradigm™ 25g and Lontrel™ Advanced at 150 and 300ml (Figure 9).

Overall Lontrel™ Advanced caused severe vigour reduction at both rates, with purpling, yellowing, withering/curling, and plant death, especially for lentils (30% biomass reduction at 28DAE for 150 ml/Ha Lontrel™ Advanced, and 40% biomass reduction at 28DAE for 300 ml/Ha Lontrel™ Advanced), Lucerne, vetch, chickpeas, and faba beans. The highest incidence of symptoms was observed at 28DAE, and plant death was the most severe vigour reduction observation at 70DAE.

The symptoms observed as a result of Group B or Lontrel™ Advanced residual would not be commercially acceptable. Talinor®, however, had a maximum of a 5% vigour reduction 28 days and 42 days post application for the label rate, which would be commercially acceptable.

As stubble was retained at this site and was not mulched or burnt, other than a windrow burn, this could have influenced the plantback, due to Lontrel™ Advanced being tied up in the stubble.

Figure 7: Vigour Reduction 28DAE in lentils on Lontrel™ Advanced 150ml.



Figure 8: Vigour Reduction 42DAE in lentils on Lontrel™ Advanced 150ml.



Figure 9: Vigour Reduction 70DAE in lentils on Lontrel™ Advanced 150ml.



Crop Phytotoxicity (%) - 28, 42 and 70 DAE

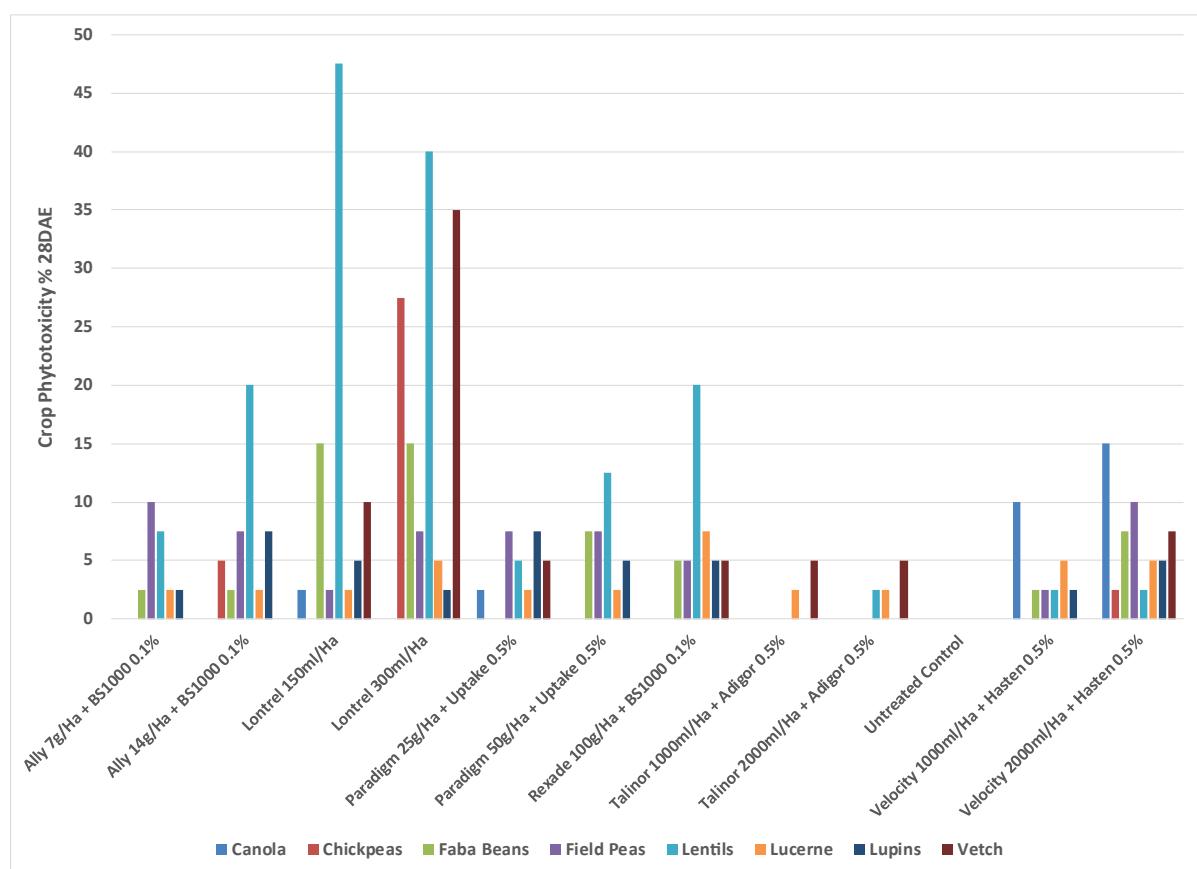
Crop phytotoxicity was measured 28, 42 and 70DAE. Crop effects include delayed emergence, discolouration, leaf wilting or burning, leaf curling, leaf necrosis, biomass reduction, yellowing, bleaching, purpling, and in severe cases plant death, (Figure 10).

28DAE: The most severe crop phytotoxicity at 28DAE was from lentils, with 47.5% phytotoxicity for 150 ml/Ha Lontrel™ Advanced, and 40% for 300 ml/Ha Lontrel™ Advanced. At 28DAE, Ally® and Lontrel™ Advanced caused the highest levels of crop phytotoxicity (Figure 11).

Figure 10: Crop Phytotoxicity symptoms observed at 28DAE.



Figure 11: Crop Phytotoxicity percentage at 28DAE, 24th July 2018.



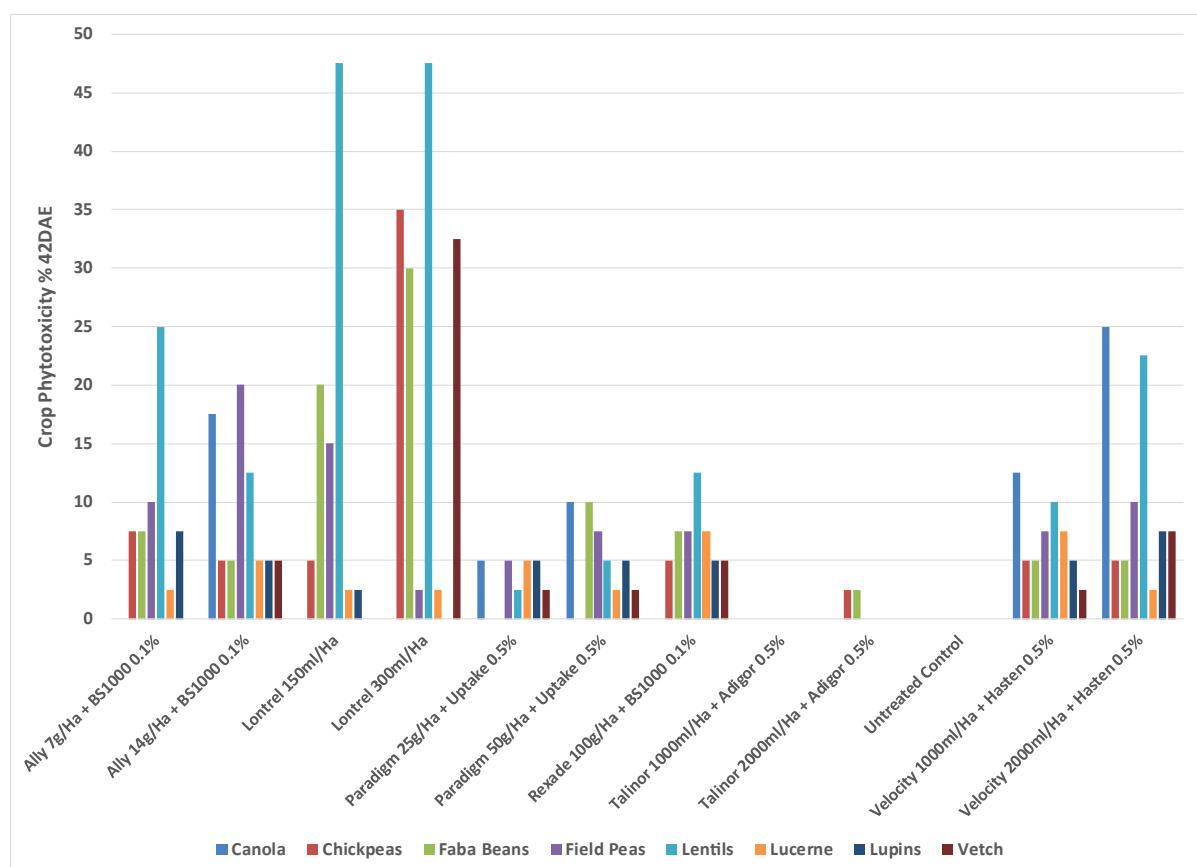
42DAE: The most severe crop phytotoxicity at 42DAE was observed again in Lentils, with both the 150 ml/Ha 300 ml/Ha Lontrel™ Advanced treatments exhibiting 47.5% phytotoxicity (Figure 12).

Group B products and Lontrel™ Advanced caused the greatest amount of phytotoxicity at this timing (Figure 13).

Figure 12: Crop Phytotoxicity symptoms observed at 42DAE.



Figure 13: Crop Phytotoxicity percentage at 42DAE, 7th August 2018.



70DAE: 14g/Ha Ally® caused the most phytotoxicity across crop types at 70DAE, with Lucerne exhibiting the most symptoms, with 45% phytotoxicity, which is not commercially acceptable (Figure 14).

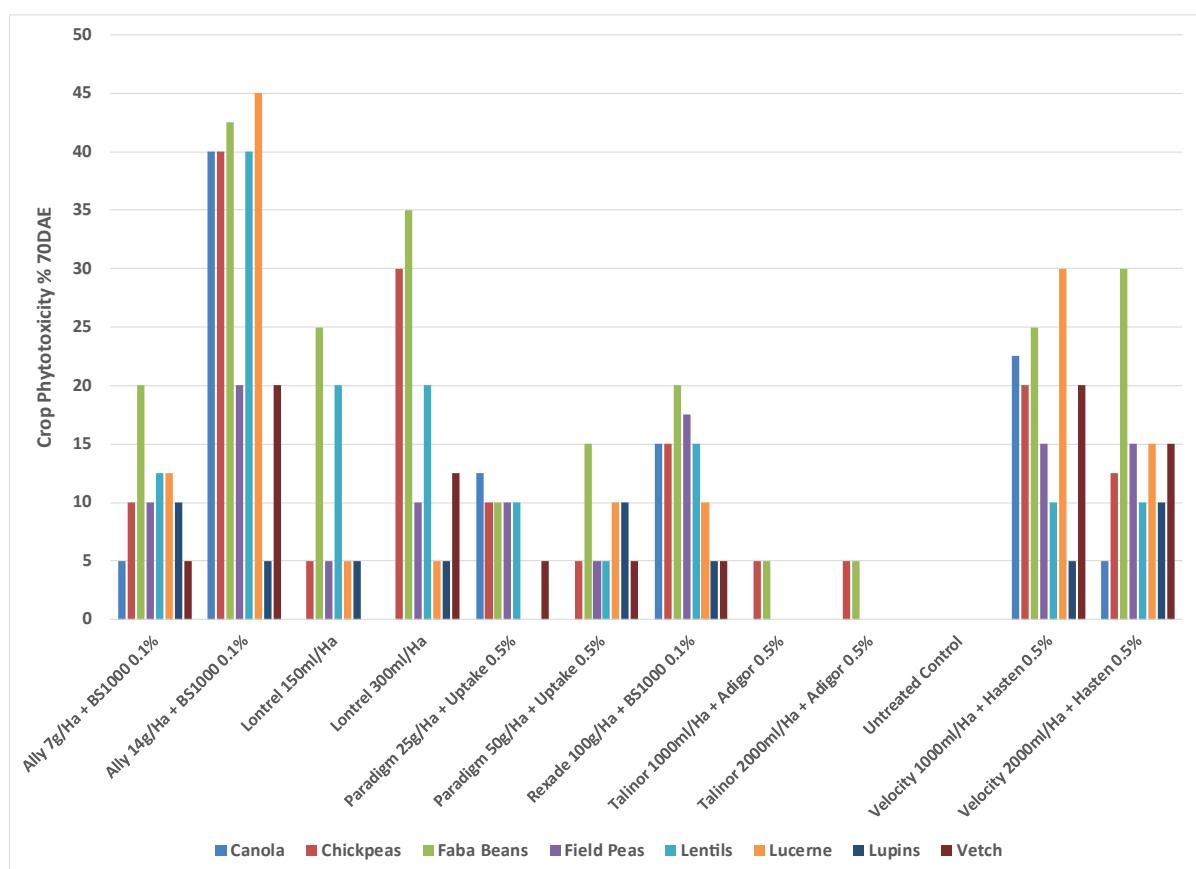
Lontrel™ Advanced at the higher rate caused the next highest level of phytotoxicity from a treatment, with 35% phytotoxicity observed on faba beans.

Talinor® had a maximum of 5% phytotoxicity recorded at 28DAE for vetch, and 5% at 70DAE for both chickpeas and faba beans (Figure 15). These measurements are commercially acceptable.

Figure 14: Crop Phytotoxicity symptoms observed at 70DAE.



Figure 15: Crop Phytotoxicity percentage at 70DAE, 4th September 2018.





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