Post-seeding Ripping

Host: Williss Family (South Stirlings).

By: Dan Fay, Research and Development Co-ordinator, SCF

KEY MESSAGES:

- **The deep ripping implemented in 2021 (pre- and post-seeding) was effective in reducing the soil strength (soil compaction) in both 2021 and 2022, however, no significant difference between ripping timing was observed.**
- **Post-seeding ripping significantly reduced barley yields in 2021, with the highest yields observed in the pre-seeding ripping treatments.**
- **The benefits of ripping were observed in all ripped treatments, regardless of timing, in the following canola crop in 2022.**
- **If post-seeding ripping is to be undertaken, seeding a lower-value crop or attempting to rip between wide sown legumes may be a better option.**

Background

This project was undertaken to build on the extensive work that has been conducted to determine how deep ripping can be best implemented to improve crop production in Western Australia. Deep ripping is an effective amelioration technique on the sandplains, and sandy duplex soils common to the lower Great Southern region of Western Australia. Deep ripping has become a best practice agronomic tool on these responsive and easily compacted soil types.

However, the window in which deep ripping can be effectively implemented whilst minimising erosion risk is narrow and varies depending on when the season break occurs. As a result, most deep ripping is currently being implemented in the narrow window after the autumn break and prior to seeding, or opportunistically after a late summer rain event. Given there is a tendency to sow earlier in the WA HRZ, the ideal window for deep ripping is shrinking further, forcing farmers to choose between risking wind erosion by ripping prior to the seasonal break or to delay seeding.

This trial investigated whether there is an opportunity for deep ripping to take place outside the narrow window prior to seeding.

Methodology

The post season ripping trial was located at Takalarup, on a shallow sand over clay duplex soil. The ripping treatments were implemented post-seeding in 2021 and each treatment was replicated twice and randomised, with extra control and tramline buffer plots to bolster the baseline data. The 2021 treatments included:

- Nil ripping (control)
- Pre-seeding ripping (standard practice)
- 1-week post-seeding ripping
- 3-weeks post-seeding ripping
- 6-weeks post-seeding ripping

Measurements were undertaken in the 2021 (barley) crop and the following 2022 (canola) crop and included:

- Soil Strength (CP200 cone penetrometer)
- Plant establishment and tillering (counts)
- Plant biomass (dry matter t/ha)
- Harvest yield (t/ha)

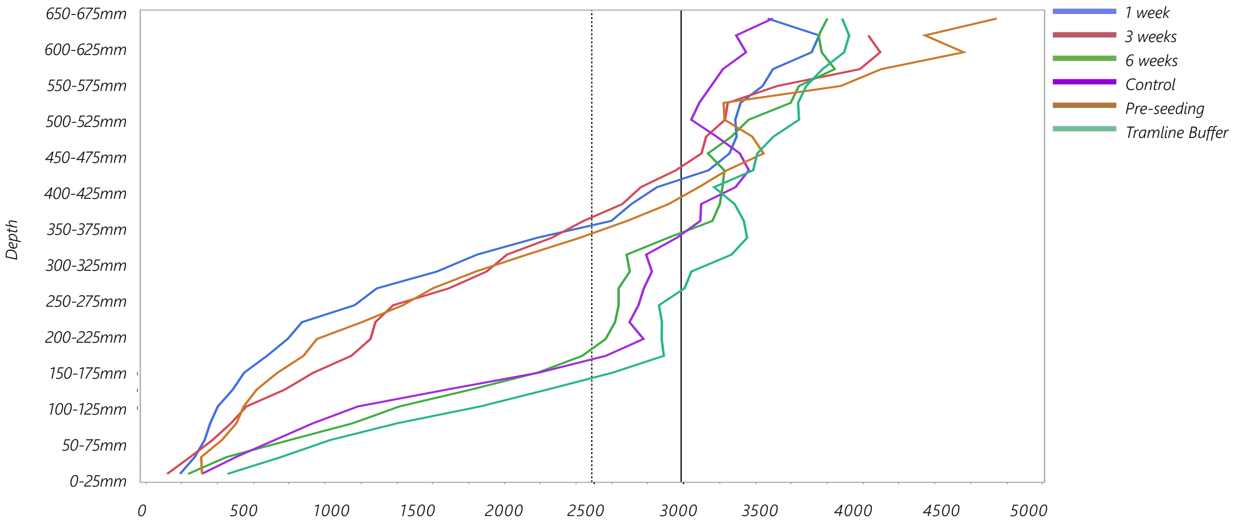

Figure 1: Graph of mean soil strength (kPa), 2022

Results and Discussion

The results described below are predominantly for the 2022 season only as 2021 results were included in the 2021 Trials Review Booklet.

The penetrometer data collected in 2022 found that all ripping treatments were effective in reducing soil strength (Figure 1) and there was no advantage in the effectiveness of deep ripping to reduce soil strength when conducted post seeding as opposed to pre-seeding. This corresponded to the 2021 penetrometer data.

Although the 2021 results showed the post-seeding ripping treatments significantly reduced the plant and tiller counts, there was no significant difference in the establishment of canola in 2022 between the previous year's ripping treatments. The biomass results in 2021 echoed those of crop establishment, with the biomass being significantly reduced in the post-seeding ripped treatments. It should be noted that each plot was subject to yield limiting waterlogging, which likely reduced the yield potential of all the plots.

Barley yields in 2021 were significantly reduced in the post-seeding ripped treatments (Figure 2), with the barley yielding highest in the pre-seeding ripped treatments (standard practice). In 2022, there appeared to be some influence of the ripping treatments on canola yields (Figure 3). Although it is not statistically significant, all four of the ripping treatments outyielded the untreated control, suggesting that the deep ripping is still having positive influence on yield, one year on. There was no significant difference when comparing the ripping treatments, suggesting that the timing of the deep ripping had no ongoing influence on yield.

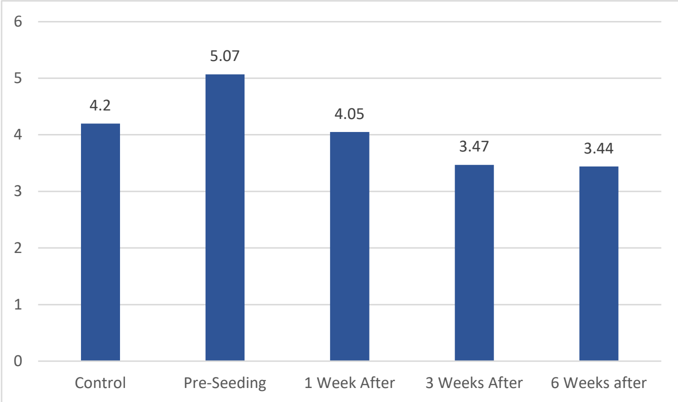

Figure 2: Barley yield t/ha for each treatment, 2021

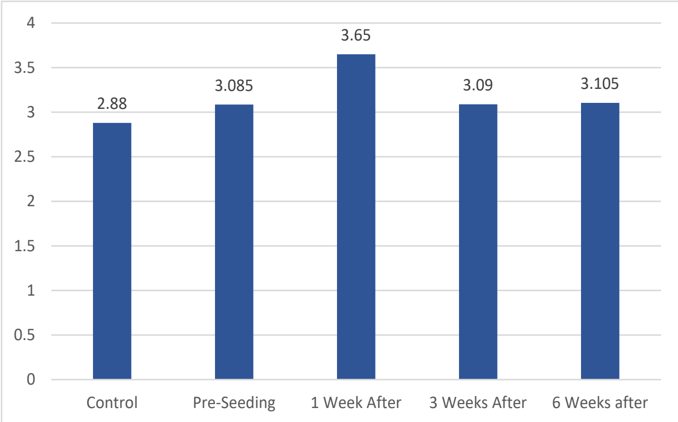

Figure 3: Canola yield t/ha for each treatment, 2022

Conclusion

While the yield advantage resulting from the deep ripped treatments in 2022 was rather small (200-600kg/ha of canola) the high commodity price of canola ($850/t) resulted in an economic advantage of between $170 and $510/ha. This economic gain in 2022 largely offsets the losses resulting from the crop damage sustained in the barley in the 2021 season (730kg/ha) where the barley price was approximately $300/t. Given that the effects of deep ripping to depths of 500mm often last four seasons, it is likely the ripped plots will continue to outperform the control area, driving additional economic benefits from the