



Non-wetting soil management options for growers in the Albany Port Zone

Hosts: Webster Family

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KEY MESSAGES

- Seeding 'on-row' or 'near-row' significantly improved germination and early biomass for canola in the 2020 season.
- Seed placement was a more significant factor than the wetting agent treatments for improving germination and early biomass in canola in 2020.
- SE14 was more effective when placed closer to the seed compared to a surface application behind the press wheel in 2021.
- There were no significant canola yield differences between treatments in the 2020 growing season.
- In the 2021 growing season, there were no increases in wheat grain yield as a result of wetting agent treatments that were applied in 2020.

Background

In recent years, grain growers in the Albany port zone have found it more challenging to achieve an even crop germination because early growing season conditions are drier and more volatile. Non-wetting expression is particularly problematic for growers with forest gravels. These soils usually rely on late summer and early autumn rains to alleviate their non-wetting properties for plant germination. Growers and advisers are looking at cheaper mitigation options rather than costly soil amelioration to alleviate non-wetting soils effectively.

Conventional methods of managing non-wetting involve mechanical disturbance of the soil structure to mix the non-wetting particles with wettable particles. Mechanical disturbance includes claying, deep ripping with inclusion plates, ploughing and spading. These are expensive to implement for the grower; but, they also have long-lasting results. They also carry a significant economic risk due to the cost and environmental risk from wind erosion.

Some mitigation options being looked at include wetting agents, on-row seeding, furrow seeding and stubble retention. There are a range of wetting agents available on the market for farmers to use and a range of placements including on the seed, below the seed, in the seed contact zone or on the furrow surface. Previous research by Glenn McDonald (DPIRD) found that wetting agents will help crop germination and water infiltration at the end of the season, which assists in grain filling. He also noted a long-term benefit of using soil wetters in paddocks and farmers

have anecdotally supported this observation. A farm-scale trial was established at Tenterden in 2020 on highly non-wetting forest gravel. The replicated air-seeder width trial included 11 treatments over 200m long and was sown initially to canola in 2020, followed by wheat in 2021.

2021 Trial Method

In 2021, the grower sowed wheat directly over the 2020 canola plots without using a wetter or engaging the Pro-Trakker. The aim in 2021 was to determine if there were any residual yield benefits from the treatments applied the year before.

Key details

- The trial utilised the grower's liquid delivery system applying 50L/ha of water plus product on the furrow behind press-wheel in 2020.
- For the 2020 season the trial was harvested using a combination of a farmer's harvester and small-plot machine.
- In 2021 the trial was harvested using a small-plot harvester only.
- Soil type- Forest Gravel: MED testing between 3.4-3.6 (severe to very severe) non-wetting.



Treatments

1. Untreated Control
2. 2 L/tonne SE14 directly on the seed
3. 4 L/tonne SE14 directly on the seed
4. 2 L/ha SE14 behind press wheel
5. 4 L/ha SE14 behind press wheel
6. 2 L/tonne SE14 directly on seed and 1 Lt/ha behind press wheel
7. 2 L/ha SE14 behind seed boot
8. 4 L/ha SE14 behind seed boot
9. 1 L/ha SE14 behind seed boot and 1 L/ha behind press wheel
10. 2 L/ha SE14 behind seed boot and 2 L/ha behind press wheel
11. 2 L/ha BASF Divine (80% integrate / 20% Agri) behind press wheel

Results & Discussion

For a comprehensive summary of the 2020 trial results, please look at pages 14-15 of the 2020 Stirlings to Coast Farmers Trials Review Booklet.

2021 Results

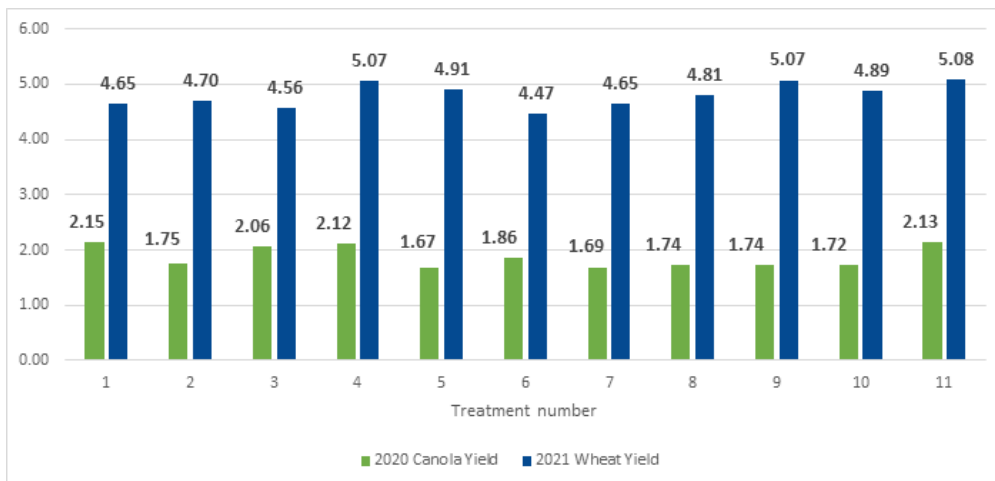


Figure 1: Grain yields (t/ha) recorded in 2020 (canola) and 2021 (wheat) at the Webster/Beech non-wetting trial site in Tenterden. No statistical differences were measured between treatments in 2020 or 2021.

- There were no significant differences between wheat yields in 2021 from the wetting agent treatments applied in 2020.
- In 2021 698.4mm of rainfall (Decile 10) fell between April 1-October 30 at the West Kendenup DPIRD weather station, effectively removing the non-wetting soil constraint in 2021.

Conclusion 2021 Results

Growers have anecdotally observed long term cumulative benefits from applying soil wetting agents year on year. We attempted to measure this observed benefit in the trial design, but the unusually wet 2021 season minimised the expression of non-wetting at this site. Data from our trial does not support the hypothesis that wetting agents provide residual benefits for more than one growing season. However, the idea deserves further research since it would add utility to wetting agent investments made by growers.



A GRDC Invested Trial. Thank you to Southern Dirt for inviting Stirlings to Coast Farmers to collaborate on this project.