



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

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KEY MESSAGES:

- There were no significant differences between wheat yields in 2021 from the wetting agent treatments applied in 2020.
- There were no residual yield benefits in 2021 from any wetting agent treatments applied in 2020.
- Growing season rainfall between April 1 and October 30 at the West Kendenup DPIRD weather station was 698.4mm (Decile 10). This effectively removed any non-wetting soil constraint for the 2021 season.

BACKGROUND:

Non-wetting expression can be very problematic for growers with forest gravels, due to their reliance on late summer and early season rains to alleviate the soil's non-wetting properties for plant germination. Non-wetting soils result in patchy and delayed crops, staggered weed germination, increased water erosion, and difficulty spraying crops with different growth stages. Growers are looking at cheaper alleviation rather than expensive mechanical soil amelioration to improve crop establishment in non-wetting soils.

Recent non-wetting mitigation options that have been explored include wetters, on-row seeding, near-row seeding and stubble retention. There are a range of wetting agents on the market. Wetters can be placed 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, assisting grain filling. He also noted a long-term cumulative benefit of using soil wetters in paddocks. Anecdotally, growers have also observed an incremental benefit from applying soil wetters year after year.

This trial aims to determine the best rate and placement of soil wetters for growers to mitigate non-wetting effects and achieve the best possible crop emergence without mechanical disturbance of non-wetting forest gravel soils.

METHOD:

In 2020, the following treatments were applied to a canola crop in the Webster/Beech's Tenterden paddock.

- 1 *Untreated Control*
- 2 *2 Lt/ha SE14 behind press wheel*
- 3 *4 Lt/ha SE14 behind press wheel*
- 4 *2 Lt/tonne SE14 on seed*
- 5 *4 Lt/tonne SE14 on seed*
- 6 *2 Lt/ha SE14 behind tyne & 2 Lt/ha behind press wheel*
- 7 *1 Lt/ha SE14 behind tyne & 1 Lt/ha behind press wheel*
- 8 *2 Lt/ha SE14 behind tyne*
- 9 *4 Lt/ha SE14 behind tyne*
- 10 *2 Lt/ha BASF Divine behind press wheel*
- 11 *2 Lt/tonne on Seed & 1Lt/ha behind press wheel*

A complete summary of the 2020 results can be found in the projects section of the SCF website (www.scfarmers.org.au/nonwetting). In 2021, we did not add further treatments to the wheat crop sown on 22 May. The aim in 2021 was to measure any yield benefits to the second crop due to the wetting agents applied in 2020.



RESULTS (2021):

- There were no significant differences between wheat yields in 2021 from the wetting agent treatments applied in 2020.
- There were no residual yield benefits in 2021 from any wetting agent treatments applied in 2020.
- There were no cumulative yield benefits obtained in 2020 & 2021 from any wetting agent treatments, compared to the untreated control.
- There was 698.4mm (Decile 10) rainfall between April 1-October 30 at the nearest (West Kendenup) DPIRD weather station. This effectively removed the non-wetting soil constraint in 2021.

SUMMARY:

The exceptionally wet 2021 season mitigated the non-wetting nature of the forest gravel soil at Tenterden. Statistical analysis accounting for spatial effects was conducted by Andrew VanBurgel (DPIRD), but we were unable to measure significant residual grain yield benefits in 2021 from the treatments applied in 2020. This does not mean there are no residual benefits from using wetting agents; it just means we were unable to provide supporting evidence to this hypothesis from the research completed in this project.

The two most crucial project results were obtained in 2020 when canola was planted. They were:

- Seeding on or near last year's furrow significantly increased early biomass growth compared to sowing off-row.
- Placement of soil wetters in the seed contact zone behind the seed boot was more effective than applying wetter on the seed furrow behind the press wheel, for germination and early biomass.

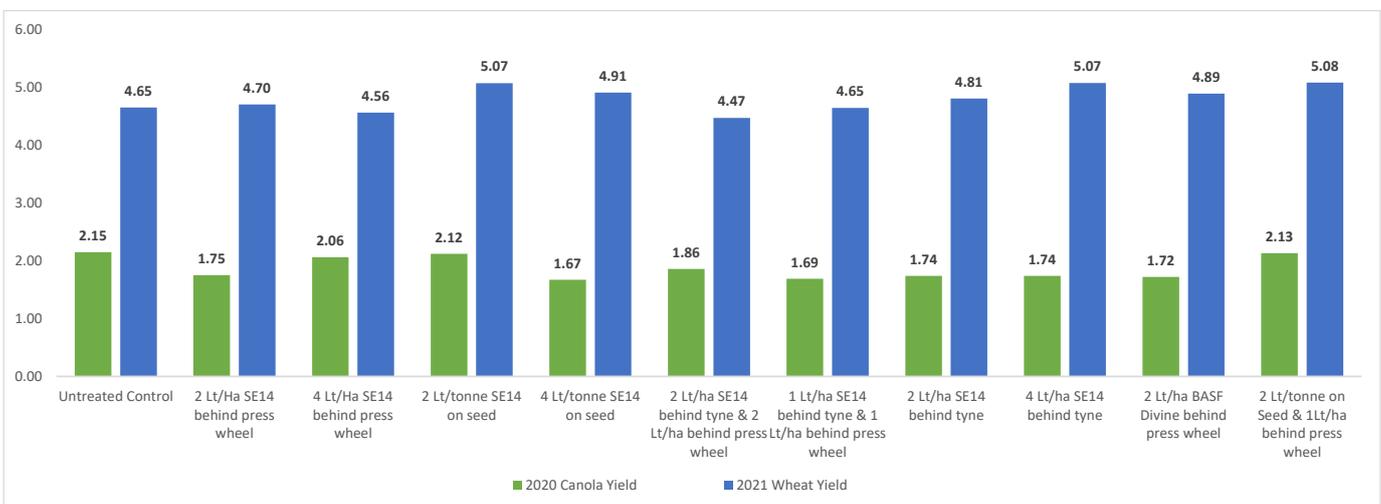
ACKNOWLEDGEMENTS:

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FURTHER READING:

Please find a related article published in the GRDC Ground Cover Magazine (January-February 2022)

Guidance systems a plus for on and edge-row sowing | Groundcover (grdc.com.au)



Graph 1: Summary of the 2020 and 2021 grain yields recorded at Webster/Beech paddock scale demonstration in Tenterden, WA. There were no significant yield differences measured in either season (not shown).