Non-wetting management options for growers in the Albany port zone

Trial Host: Michael Webster

Key Messages

- **Placement of soil wetter in the seed contact zone behind the seed boot was most effective for improving germination and early biomass growth.**
- **Seeding on or near last year's furrow significantly increased early biomass growth compared to off-row.**
- **There is high variability in expression of water repellence across paddocks and soil types along with response to soil wetter.**
- **Canola plants can compensate for low plant densities, and significant differences in grain yields are hard to detect.**

Summary

Low summer rainfall and dry growing season starts have compounded the non-wetting soil issue for crop germination. The use of soil wetters as a mitigation method offers the chance to alleviate the issue in years of concern. Through the investigation of 11 different placements and rates in a forest gravel soil, it was found the best placement of SE14 soil wetter was in the seed contact zone with significant improvement over the control in plant germination and early biomass.

- Increasing rates from 2 L/ha to 4 L/ha for each placement resulted in small improvements that were not significantly different.
- There was a significant improvement in early biomass when seed placement was on or near last year's furrow when compared to off-row.
- There were no benefits seen in yields with canola plants compensating for low plant density with increased branching and pod formation.

Background

Over the past few years, grain growers in the Albany port zone have found it more challenging to achieve an even crop germination because early growing season conditions were usually dry. Non-wetting soils are prevelant for growers with forest gravels, which usually rely on late summer and early autumn rains to alleviate the soil's 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 soil 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 farmers; however, they also have long-lasting results. Soil amelioration can be costly with the risk of severe wind erosion.

Possible mitigation options are wetting agents, on-row seeding, furrow seeding and stubble retention. There are a range of wetting agents on the market for growers to use with different placement options whether it be on the seed, down 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. Growers are also reporting long term benefits from using soil wetters, although this is hard to measure.

Results

Plant Density

- Placement of SE14 into the seed contact zone behind the seed boot was the only treatment to have a significant increase from the untreated control for crop establishment.
- Increasing the rate from 2 to 4 L/ha, in the behind the seed boot treatments, had no significant increase in plant density.
- Placement of SE14 directly on the seed or behind the press wheel had no significant differences to the control.
- The application of SE14 behind the press wheel reduced the effect of SE14 behind the seed boot when used in combination.
- High rates of SE14 directly on the seed led to them sticking together which lead to lower plants per metre established.

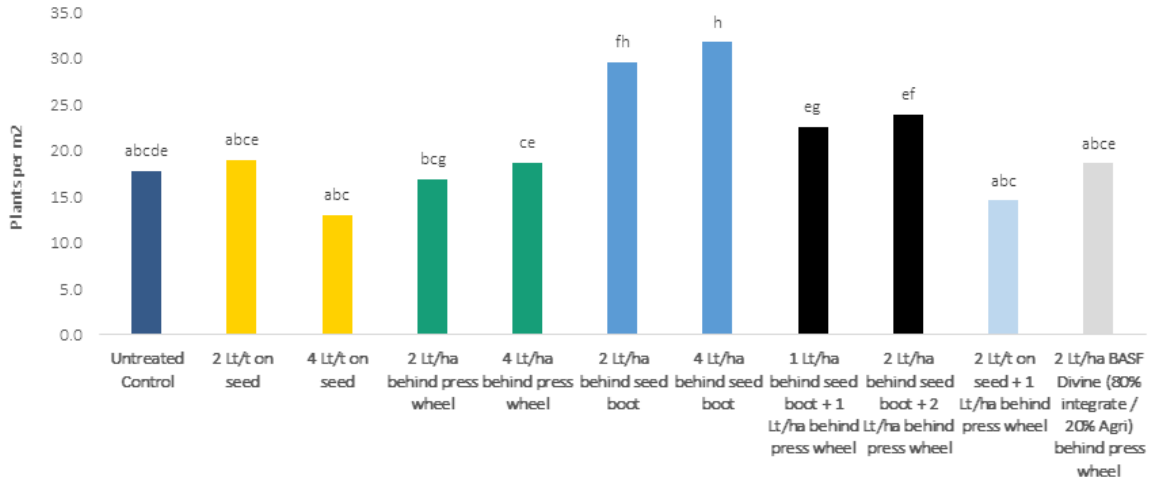

Figure 1: Plant density counts for different placements and rates of the soil wetters, SE14 and BASF Divine in a forest gravel at Tenterden WA.

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