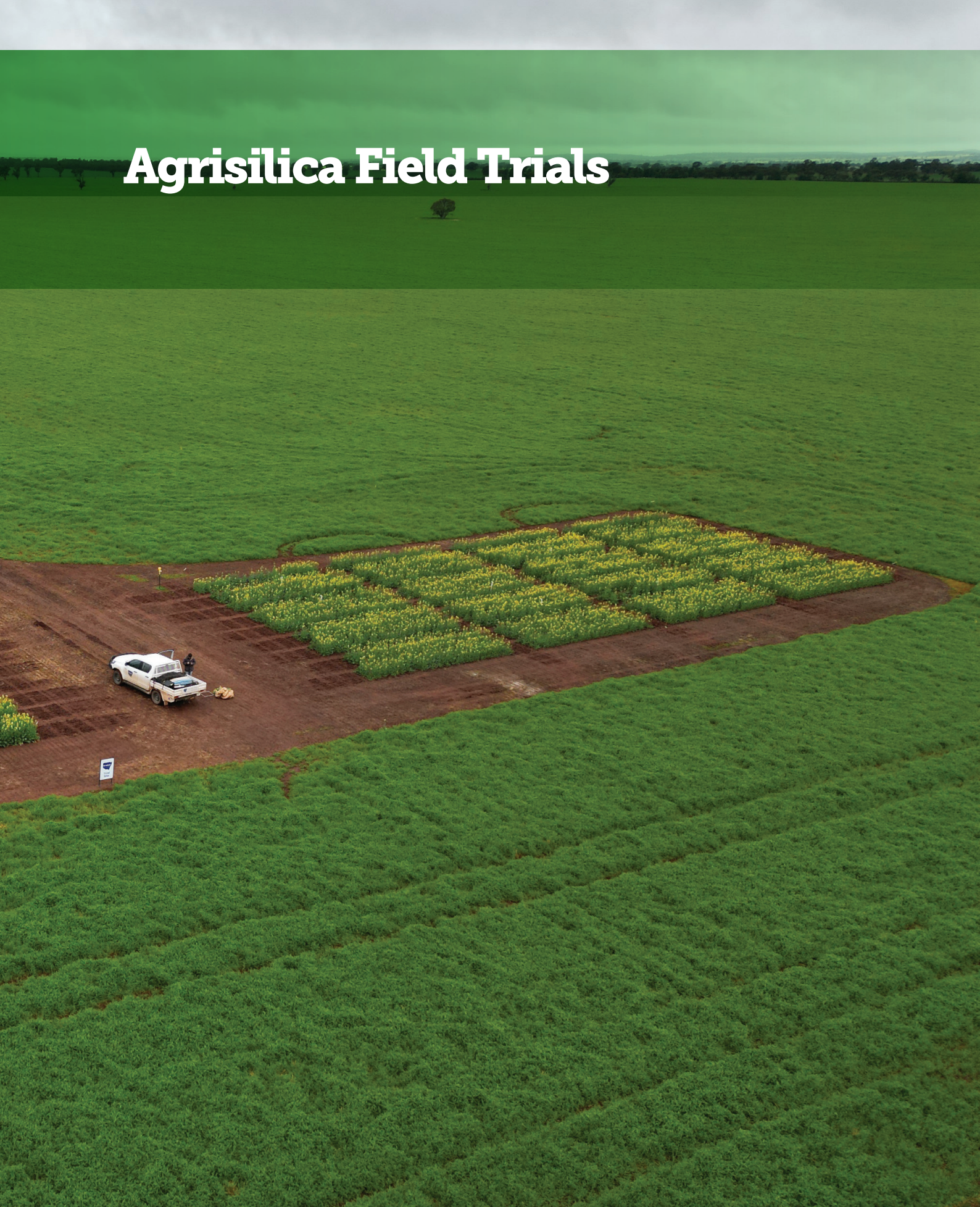


Agrisilica Field Trials



KEY POINTS

- ▶ Agrisilica® is a fertiliser high in plant available silicon that can be applied in granule or liquid form.
- ▶ Silicon is believed to help plants deal with abiotic stress such as drought, extreme heat and salinity.
- ▶ Trials conducted using Agrisilica® in 2022, were not able to show a significant benefit due to very wet conditions.
- ▶ Trials will continue over multiple seasons to further test the benefits of Agrisilica®

Project title	Agrisilica Field Trials
Funding partner	Agripower
Trial Site Locations	TAIC, Tallimba NSW
Report author	Hayden Thompson

INTRODUCTION

A common occurrence in cropping is for plants to suffer from abiotic stress. This is when there is a disturbance to the plant water status which could be caused by drought, extreme heat, frost or salinity. If a plant is suffering from abiotic stress, it is potentially more prone to attack from biotic stresses such as pests and disease.

Research has shown that increased levels of silicon in plant tissue could help to maintain a high plant water status when suffering from abiotic stress such as drought (Gong & Chen, 2012). It is believed that silicon will aid in reducing plant leaf transpiration which would be beneficial during drought conditions.

Agrisilica® is a fertiliser produced by Agripower that has a high level of plant available silicon. It can be applied as both a granule and in liquid form at any time during the growing season. Recent research conducted by Western Sydney University has shown benefits to using Agrisilica®, however Agripower would like to further test these benefits by conducting field trials across the wheat growing regions of NSW. Farmlink have started working with Agripower and two field trials have been established in 2022. This work will be ongoing across multiple seasons.

METHODOLOGY

To evaluate the effect of different rates of Agrisilica® on plant growth and yield. Two trials were setup by FarmLink so that two locations could be used to study two different crop types. A wheat trial was setup at TAIC and a canola trial at Tallimba NSW. Both trials were sown as small plot trials with a nutrition and pesticide strategy of best farmer practice. This included applying MAP at sowing, topdressing with urea and applying herbicides and fungicides where needed.

Agrisilica® was applied in different forms (granule and liquid), rates and times to a range of treatments which are shown in Table 1. A dry matter cut was taken at peak biomass, grain yield and quality were measured, and soil testing was conducted to determine any differences between the treatments. Level of pests and disease across the sites was also noted.

Table 1 - List of treatments for both TAIC and Tallimba Agrisilica trials including product, timing and rate.

No.	Trial	Product	Timing	Rate
1	TAIC (Wheat)	Nil Control	Nil	Nil
2	TAIC (Wheat)	Granules	With Seed at Sowing	75kg/ha
3	TAIC (Wheat)	Granules	With Seed at Sowing	150kg/ha
4	TAIC (Wheat)	Granules	Post Emergent Top Dress	75kg/ha
5	TAIC (Wheat)	Granules	Post Emergent Top Dress	150kg/ha
6	TAIC (Wheat)	Liquid	Late Tillering	2.5L/ha
7	TAIC (Wheat)	Liquid	Late Tillering	5L/ha
1	Tallimba (Canola)	Nil Control	Nil	Nil
2	Tallimba (Canola)	Granules	With Seed at Sowing	100kg/ha
3	Tallimba (Canola)	Granules	With Seed at Sowing	200kg/ha
4	Tallimba (Canola)	Granules	Post Emergent Top Dress	100kg/ha
5	Tallimba (Canola)	Granules	Post Emergent Top Dress	200kg/ha
6	Tallimba (Canola)	Liquid	Stem Elongation	2.5L/ha
7	Tallimba (Canola)	Liquid	Stem Elongation	5L/ha

RESULTS

Rainfall

The 2022 season had very high rainfall which made it very difficult to study the effect of Agrisilica® as it would have a more prominent effect in drought conditions. The rainfall data for TAIC and Tallimba is shown in Figure 1 and 2 respectively to highlight the very high figures recorded. TAIC had a total of 610mm growing season rainfall (April to October) and Tallimba had a total of 604mm.

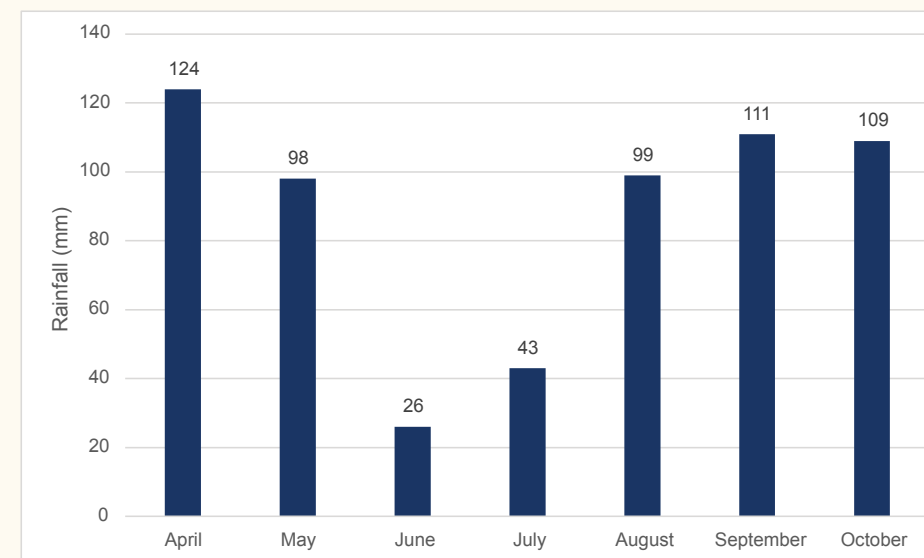


Figure 1 - Growing season rainfall recorded at TAIC in 2022.

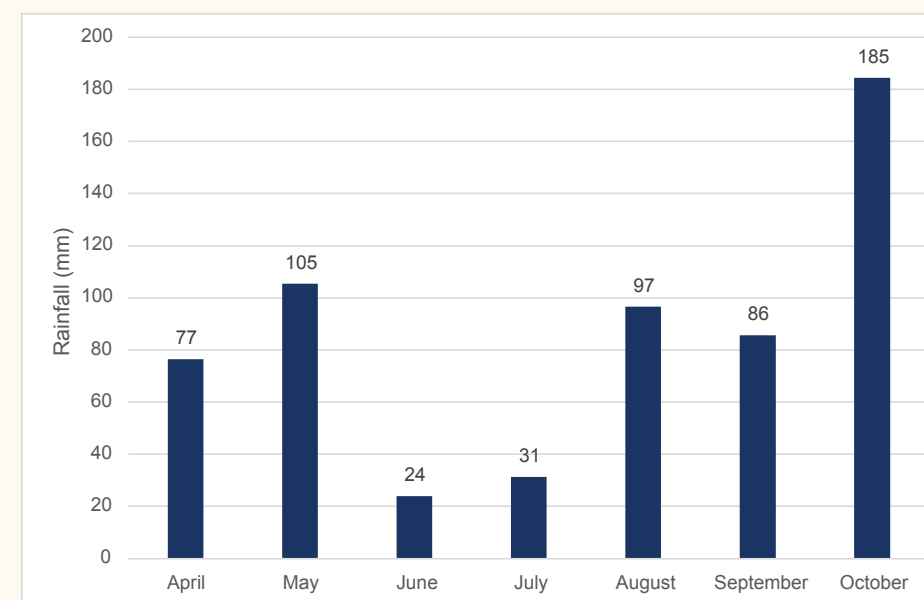


Figure 2 - Growing season rainfall recorded at Tallimba in 2022.

RESULTS

TAIC Wheat Trial

The Wheat trial was impacted by the very high rainfall with waterlogging likely to have reduced the overall average yield. However, pest and disease levels were not significant at any time throughout the season and no difference in severity between treatments was observed. A biomass cut was taken at anthesis to record total dry matter of each treatment. There was no variation across the trial with each cut consistently showing 7T DM/ha. Grain yield and quality results are shown in Figure 3

There was no significant difference ($P>0.05$) shown in grain yield between the treatments, however, applying the Agrisilica® as granules at sowing time may have slightly increased grain yield when used at the higher rate. This trend is not followed for the post-emergent granule or liquid treatments.

Protein percentage of the grain was more variable between treatments but again, it was not significant, and a trend could not be established. With no trends obvious, it highlights that there are other factors influencing the results which is most likely to be the very wet conditions. This suggests that it is important to reevaluate the treatments across multiple seasons. Soil testing was conducted following harvest of the trial, however there were no differences in moisture or plant available silicon recorded.

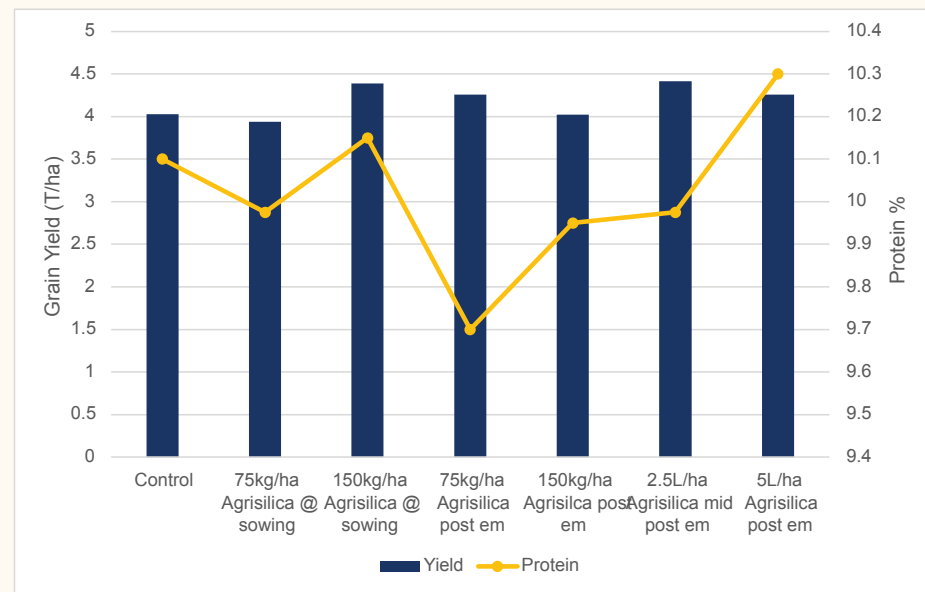


Figure 3 - Grain yield and protein results from the TAIC wheat trial in 2022.

RESULTS

Tallimba Canola Trial

Although there was less waterlogging damage at Tallimba than at the TAIC site, there would have still been no time when abiotic stress caused by drought conditions would have been experienced. Pests and disease levels had no impact on trial results and a biomass cut taken at anthesis did not show any differences between treatments with an average yield of 4.8T DM/ha. Grain yield and protein results are shown in Figure 4.

Similar to the results of the wheat trial, the canola yield did not show any significant difference ($P>0.05$) between treatments with even more consistent results than the wheat. This means that an increase in yield with increasing Agrisilica® is not obvious.

Protein results were more variable between treatments, but no clear trend could be established. Similarly soil test results had a consistent result for moisture and plant available silicon.

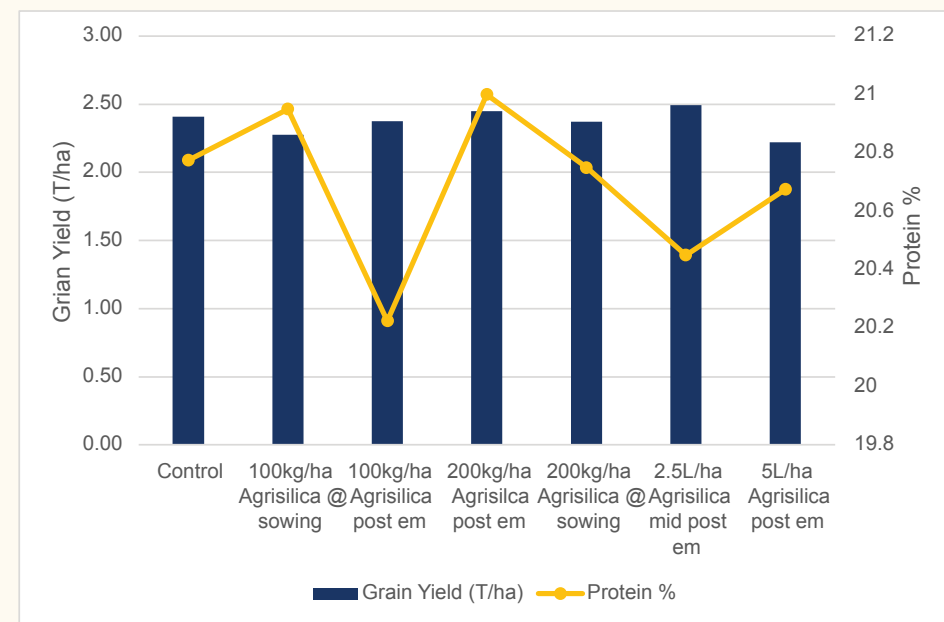


Figure 4 - Grain yield and protein results from the Tallimba canola trial in 2022.