AgGrow
AGRONOMY + RESEARCH

AG GROW PULSE NUTRITION TRIALS

Beelbangera, 2025

KEY POINTS

- **None of the tested nutritional or biostimulant treatments, whether applied at sowing or as foliar sprays, significantly influenced lentil and field pea biomass or yield under the conditions experienced in 2025.**
- **Lentil and field pea yield potential can be achieved with standard fertiliser practices, and that additional foliar applications are unlikely to provide consistent yield gains unless specific deficiencies or stress factors are identified.**

This is only one trial in one season and multi-year testing will help confirm these inputs add value to lentil and field pea production in differing seasons.

BACKGROUND

Phosphorus remains the primary nutrient of focus when establishing and managing pulse crops. Adequate phosphorus is essential for early vigour, root development, nodulation, and ultimately yield. However, a range of micronutrients — including zinc, iron, boron, manganese, molybdenum, and copper — also play important roles in plant function and can meaningfully influence crop performance. The key question is: how much real benefit are we obtaining from applying different micronutrient packages?

To address this, Ag Grow Agronomy conducted two dedicated nutrition trials in 2025 focusing on lentils and field peas — the most widely grown pulse species across our client base. The objective was to measure the impact of varying nutrition treatments on both biomass production and grain yield.

Alongside conventional macro- and micronutrient treatments, the trials also incorporated several novel compounds with emerging claims in crop production. These included acetylsalicylic acid (Aspirin) and a carbon-silica product, both of which have gained attention for their potential to improve plant resilience.

Although widely known as a human pain reliever, Aspirin has been linked in research to enhance plant growth and improved tolerance to stress factors such as moisture deficit, temperature extremes, insect pressure, and disease. Similarly, carbon-silica products are promoted for improving nutrient uptake efficiency and strengthening plant tolerance to environmental and pathogen-related stresses.

Evaluating varying nutrition strategies in lentils & field peas

These trials were designed to quantify the actual in-paddock response of lentils and field peas to these nutrition treatments under Riverina conditions, helping determine which inputs deliver measurable agronomic and economic value.

TRIAL DETAILS

The trials were established at the Ag Grow Agronomy research farm "Ridgetop" in Beelbangera, approximately 16 km NE of Griffith. The trials were sown on 30th April 2025, with GIA Thunder lentils sown at 40 kg/ha and APB Bondi field peas sown at 120 kg/ha, following wheat in 2024. The trials were rolled 27th May 2025.

Soil tests conducted prior to sowing showed a pH ($CaCl_2$) of 6.2, total nitrogen (0-60 cm) of 57 kg N/ha and Colwell phosphorus of 38 ppm. Nutrition treatments were applied as per treatment list, table 1, with products used for each treatment in table 2. Plant tissue tests were undertaken 24th June to help determine which micronutrients were limiting and needed to be applied as an in-crop foliar spray. Appropriate pest, disease, and weed management was undertaken as needed. The trials were harvested on 29th and 30th October 2025.

Table 1: Nutrition treatments and timings for the Lentil and Field Pea Trials 2025.

Trt No.	Treatment	Application Timing & Details	Date applied
1	60kg MAP + 25g Sodium Molybdate	foliar treatment early vegetative	4.07.2025
2	60kg MAP + 50g Sodium Molybdate	foliar treatment early vegetative	4.07.2025
3	60kg MAP + 25g Sodium Molybdate + Zinc + Copper + Boron	foliar treatment early vegetative	4.07.2025
4	Superphosphate (match P to 60 kg MAP)	at sowing	30.04.2025
5	Superphosphate (match P to 120 kg MAP)	at sowing	30.04.2025
6	60kg MAP + Amino Boss Legume Blend	foliar treatment at flowering	15.08.2025
7	60kg MAP + Asprin	foliar treatment at flowering	15.08.2025
8	60kg MAP + Silicon Treatment	foliar treatment at flowering	15.08.2025

NOTE: all treatments (except treatments 4 & 5) received 60 kg/ha MAP at sowing
Treatments 4 & 5 received urea to balance N toequivalent N in 60 kg/ha MAP
Treatment 3 was applied in 2 separate passes due to compatibility of products

Table 2: Products used in the trial

Treatment	Product Used	Rate	Product Description
Sodium Molybdate	Barmac Sodium Molybdate	as per trt	Soluble crystalline fertiliser - 39% Molybdenum
Boron	Optifert Boron Soluble	0.3% mix	Disodium Octaborate Tetrahydrate - 21 % Boron
Zinc	CS Tracer Zinc	4 L/ha	Novel amino acid chelated micronutrient concentrate of a highly soluble zinc solution - 15% Zinc
Copper	CS Tracer Copper	2 L/ha	Novel amino acid chelated micronutrient concentrate of a highly soluble copper solution - 6.8% Copper
Pulse Booster	Amino Boss Legume Blend	5 L/ha	Amino acid chelate solution - blend contains trace elements Zinc, Manganese, Copper, Molybdenum, Iron, Boron and Cobalt
Apririn	Aspirin tablets	1 tablet /L	100mg tablets
Silicon	CS Carbon Silica	3 L/ha	Combines mono silicic acid, humic acid, fulvic acid, and carboxylic acid

Seasonal Conditions 2025

Conditions for the first 4 months of the year were dry, with below average rainfall and above average temperatures. Warm and dry conditions persisted into May, with some much-needed rain falling towards the end of the month, table 3.

Follow up rain occurred mid-late June, before the crop accessed stored moisture.

With warmer, windy days and frosts impacting topsoil moisture, below average rainfall continued throughout June, July and August as drought conditions strengthened.

Much needed rain occurred in early September, setting up the crop.

The Beelbangera trials received 166.5mm of growing season rainfall (GSR) from April–October (200.5mm GSR average) with 76mm of this rainfall received in September and October.

Table 3: Rainfall for Ridgetop 2025, compared to Griffith Airport and long-term Griffith rainfall data (Griffith Airport - nearest met station).

MONTH	Ridgetop Rainfall 2025	Griffith Airport 2025	Griffith Airport Long Term (1958 to 2025)
January	4	4.4	36.3
February	18	23.6	28
March	32	25	35.3
April	*13.5*	*12.4*	*29.3*
May	*18*	*14.8*	*36.1*
June	*25*	*29*	*35.1*
July	*24.5*	*22.4*	*32.4*
August	*9.5*	*17*	*34.9*
September	*50.5*	*32.8*	*32.7*
October	*25.5*	*7.2*	*39.4*
November			
December			
TOTAL	**220.5**	**188.6**	**339.5**
GSR (April - Oct)	***166.5***	***135.6***	***239.9***

RESULTS AND DISCUSSION

Both trials were assessed for crop establishment, NDVI (Normalised Difference Vegetation Index), and crop yield (t/ha). Statistical analysis was carried out using an ANOVA (Analysis of Variance) in Genstat.

Establishment: Crop establishment was assessed 13th June when the lentils were 5-8 nodes and field peas were 6 nodes. Establishment was evaluated using a scoring system, with each plot rated from 0 to 9, where 0 indicated a failed establishment and 9 indicated very even establishment.

The trials were slow to establish, with the average establishment score of the lentils 7.0 and 6.5 for field peas, figure 1.

Figure 1: Establishment of the lentils (left) and field peas (right), June 2025.

NDVI: NDVI readings were taken on each trial twice using a handheld GreenSeeker crop sensor. The first was recorded on the 24th July at the mid to late vegetative stage and the second on the 12th August at flowering, figure 2.

Figure 2: NDVI Lentils (left) and Field peas (right) taken mid-August

The average NDVI's of the lentil trial were 0.42 at the mid to late vegetative stage and 0.68 at flowering, table 4. The average NDVI's of the field pea trial were 0.40 at the mid to late vegetative stage and 0.59 at flowering, table 5. There were no statistical differences in NDVI for both species between any of the treatments at either timing.

Table 4: Lentil Trial NDVI data, NDVI 1 24th July 2025 and NDVI 2 12th August 2025.

Trt No.	Treatment	NDVI 1	NDVI 2
1	60kg MAP + 25g Sodium Molybdate	0.43	0.66
2	60kg MAP + 50g Sodium Molybdate	0.40	0.67
3	60kg MAP + 25g Sodium Molybdate + Zinc + Copper + Boron	0.43	0.70
4	Superphosphate (match P to 60 kg MAP)	0.40	0.67
5	Superphosphate (match P to 120 kg MAP)	0.42	0.67
6	60kg MAP + Amino Boss Legume Blend	0.42	0.67
7	60kg MAP + Asprin	0.41	0.65
8	60kg MAP + Silicon Treatment	0.41	0.72
	Mean	***0.42***	***0.68***
	LSD (p=0.05)	***ns***	***ns***

Table 5 Field Pea Trial NDVI data, NDVI 1 24th July 2025 and NDVI 2 12th August 2025.

Trt No.	Treatment	NDVI 1	NDVI 2
1	60kg MAP + 25g Sodium Molybdate	0.39	0.60
2	60kg MAP + 50g Sodium Molybdate	0.42	0.63
3	60kg MAP + 25g Sodium Molybdate + Zinc + Copper + Boron	0.42	0.61
4	Superphosphate (match P to 60 kg MAP)	0.39	0.56
5	Superphosphate (match P to 120 kg MAP)	0.36	0.58
6	60kg MAP + Amino Boss Legume Blend	0.40	0.59
7	60kg MAP + Asprin	0.44	0.59
8	60kg MAP + Silicon Treatment	0.41	0.60
	Mean	***0.40***	***0.59***
	LSD (p=0.05)	***ns***	***ns***

Grain yield:

The field pea trial was harvested on the 29th October, and the lentil trial was harvested on the 30th October 2025.

The average yield of the lentil trial was 3321 kg/ha, and the average yield of the field pea trial was 3703 kg/ha, figures 3 and 4 respectively. There were no differences in grain yield between any of the treatments in both the lentil and field pea trials.

Figure 3: Grain yield of the lentil nutrition trial - harvested 30th October 2025

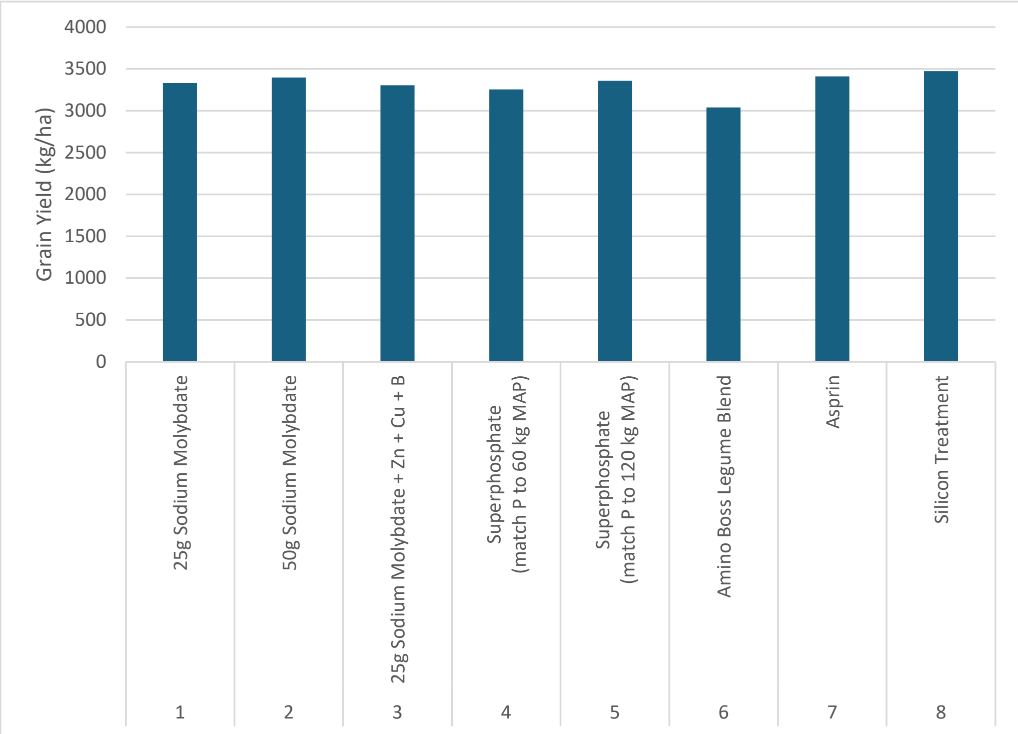
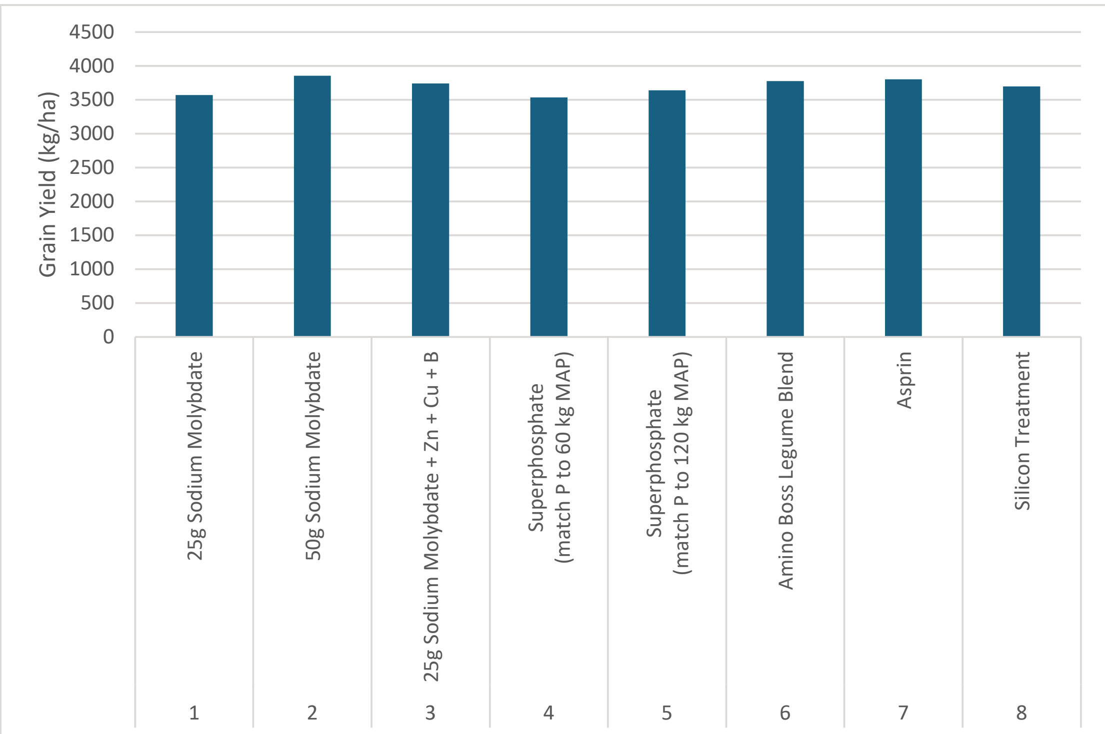


Figure 4: Grain yield of the field pea nutrition trial - harvested 29th October 2025



DISCUSSION:

Despite differences in nutrient composition and timing of application, none of the treatments produced a statistically significant effect on either biomass accumulation or final grain yield in both lentils and field peas. This indicates that, under the conditions of the current season and site, lentil and field pea growth and yield were unresponsive to the applied treatments.

The absence of significant differences among treatments suggests that both the lentils and field peas were not limited by the nutrients or compounds applied. It is also likely that the soil nutrient status and environmental conditions were adequate to support optimal growth, minimising the potential benefit of the additional foliar inputs.

The results also showed that the novel treatments (acetylsalicylic acid and silicon) didn't provide any clear yield or biomass benefits this season. Even though rainfall was below average, both lentils and field peas still performed well across all treatments. This suggests that conditions weren't stressful enough to trigger the kind of resilience responses these products are meant to support. Their benefits may be more noticeable in seasons with tougher abiotic or biotic stress, such as more severe drought, heat, or higher disease pressure.

It's important to recognise that this is only one trial in one season. More work is needed across multiple years and a wider range of seasonal conditions to determine whether certain treatments deliver measurable benefits under specific stress environments.

Further contacts

Barry Haskins	Ag Grow Agronomist	barry@aggrowagronomy.com.au
Rachael Whitworth	Ag Grow Research Manager	rachael@aggrowagronomy.com.au