HALOGEN GREENS



# RESEARCH REPORT 2026

## Magtasium™ Preliminary Trial Results: Cabbage

*Reviewed by*

**Prof. Wayne F. Truter | AgriVitality CC**
PhD, MSc.Agric, BSc.Agric
MGSSA, IAEA, LRS, Pri. Sci. Nat
Agricultural and Environmental Science Specialist
SACNASP registration: 000148
wayne.truter@fplri.org | +27 83 470 3964

**Research Support:**

Life AgriScience
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**GAUTENG:**
Lawrence Road, Poortview AH, Roodepoort
**WESTERN CAPE:**
Unit 1, 7 Firgrove Way, Firgrove Industrial Estate, Somerset West
**CANADA:**
Serenity Lane, Fredericton, New Brunswick
**Contact Number:** +27 (0)87 474 6149
**E-Mail address:** info@halogengreens.com

# Magtasium™ cabbage pot trial

**Magtasium™ is a liquid, Group-3, Bio-Stimulant.** Magtasium™ helped cabbage plants develop greener leaves and heavier heads when added to fertiliser in these greenhouse pots.

## 1. What was tested

The aim was to test Magtasium™ as a Bio-Stimulant by checking leaf greenness, plant growth and head development. The trials used sandy-loam and clay soils in 2025, followed by application comparisons in 2026. Feeding water for the fertilised treatments had a reported **EC of 0.87**. EC describes the level of dissolved salts in the feeding water.

## 2. What the trials showed

| What was measured | Magtasium™ programme | Comparison | % increase / decrease |
|---|---|---|---|
| Average leaf reading in sandy loam | 49.12 SPAD with dose A and fertiliser | 41.33 with fertiliser alone | +18.8% |
| Head mass in sandy loam | 94 g with dose A and fertiliser | 42 g with fertiliser alone | +123.8% |
| Head mass in clay | 124 g with dose B and fertiliser | 100 g with fertiliser alone | +24.0% |
| Head mass in 2026 | 1,062.5 g with weekly leaf spray and drench | 872.5 g with weekly leaf spray only | +21.8% |

SPAD is a meter reading linked to chlorophyll, the green material leaves use to capture sunlight. The first three rows compare Magtasium™ with matching fertiliser-only controls. Both programmes in the last row received Magtasium™ and fertiliser.

## 3. What this means for your farm

**The benefit went beyond greener leaves: selected programmes also built larger heads. This gives cabbage growers a measured reason to add Magtasium™ to a trial within their feeding programme.**

Start with leaf spraying plus a root-area drench. Keep fertiliser the same in treated and untreated groups, then compare head weight and leaf readings. Test the dose for your soil: dose A led head mass in sandy loam, while dose B led in clay.

## Trial context and 2025 treatments

The pre-feasibility programme began in 2025, with some measurements and harvests continuing into early 2026. The experimental layout was a randomised block design with five replicates. Soil 1 was sandy loam and Soil 2 was clay. Moisture was maintained as non-limiting. Cabbage cultivar: Conquistador.

| Code | Nutrition and product programme |
|---|---|
| T1 | Negative control: no product treatment; no designated fertilisation |
| T2 | Positive control: non-nutrient-limiting fertilisation; no product treatment |
| T3 | Positive control plus Magtasium™ dose A |
| T4 | Negative control plus Magtasium™ dose A |
| T5 | Positive control plus Magtasium™ dose B |
| T6 | Negative control plus Magtasium™ dose B |
| Dose A | 20 mL/L water foliar application weekly plus 5 mL/L drench weekly |
| Dose B | 40 mL/L water foliar application weekly plus 10 mL/L drench weekly |

The most informative product contrasts are T3 versus T2 and T5 versus T2 within the fertilised setting, and T4 versus T1 and T6 versus T1 within the unfertilised setting.

### 2026 Cabbage treatment programme

| Code | Interval | Foliar mL/L | Drench mL/L | NPK plus trace |
|---|---|---|---|---|
| T1 | Weekly | 20 | - | Yes |
| T2 | Weekly | 20 | 2.5 | Yes |
| T3 | Every 2 weeks | 20 | 2.5 | Yes |
| T4 | Every 4 weeks | 20 | 2.5 | Yes |
| T5 | Daily | - | 7 | No |

Treatment codes are used consistently within each phase; they are not interchangeable between the 2025 screening and 2026 application trial.

#### Source schedule discrepancy

The source methodology table lists the daily T5 drench as 7 mL/L. The legends on the cabbage graphs list it as 2.5 mL/L. Both source values are retained here; the original trial records are needed to resolve this difference.

### Measurements and interpretation

SPAD (Soil Plant Analysis Development) is a non-destructive meter-based index of relative leaf greenness. It supports comparisons of chlorophyll-related physiological status within a crop and programme; it is not a direct measurement of leaf nitrogen or photosynthetic rate.

Application rates above are formulation volumes per litre of application water. They cannot be converted to hectare rates without spray or drench volume, plant density and application-frequency records. Only treatments explicitly designated NPK plus trace received the complete nutrient programme.

The source report presents descriptive comparisons. Where numerical means are stated, percentages are calculated from the recorded values. Graphs and photographs are reproduced as complete images. The source states that statistical significance could not be independently assessed from the available report material. Pot-scale harvest masses must not be read as estimates of commercial field yield.

#### Reading the results

The following pages retain the source figure numbers and scientific findings. The 2025 and 2026 programmes are presented separately, followed by the cabbage conclusion and visual observations.

### 3.2. Leafy vegetables

#### 3.2.1 Cabbage (Brassica oleracea var capitata)

Cabbage responses were assessed using leaf greenness, plant height, head mass, leaf residue mass and head circumference, with particular emphasis on allocation to the marketable head.

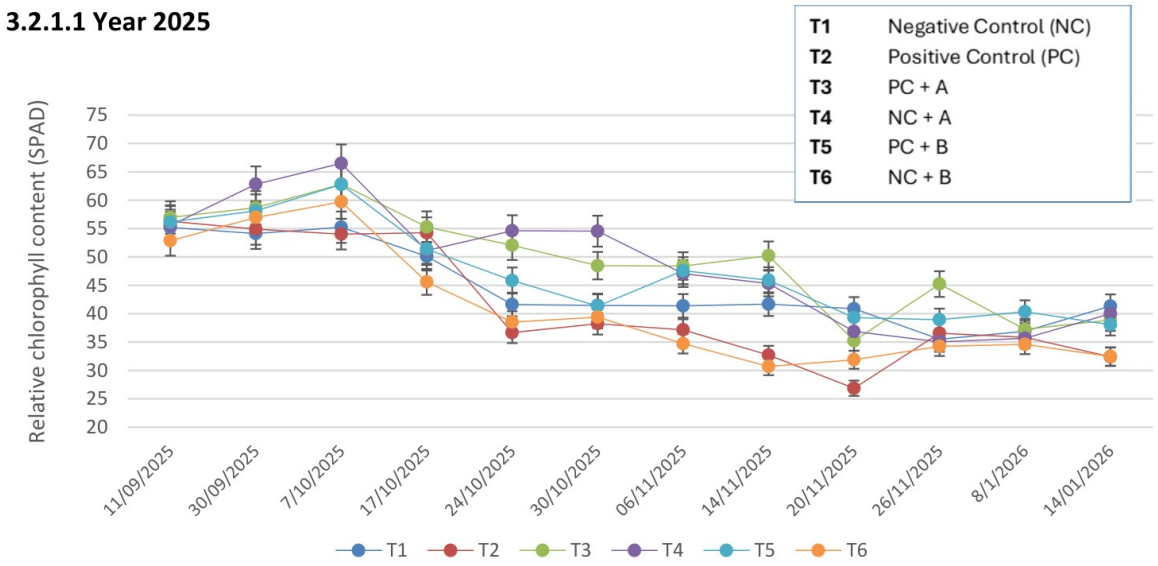


Figure 3.2.1: Relative chlorophyll content (SPAD) of cabbage in soil 1 in a pre-feasibility trial

Descriptive mean SPAD was 49.12 in T3 and 47.15 in T5, compared with 41.33 in T2. T4 averaged 48.76 compared with 44.62 in T1; T6 averaged 40.98. The A programme showed favourable chlorophyll-related responses with and without fertilisation in sandy loam. The B response was less consistent in the unfertilised comparison.

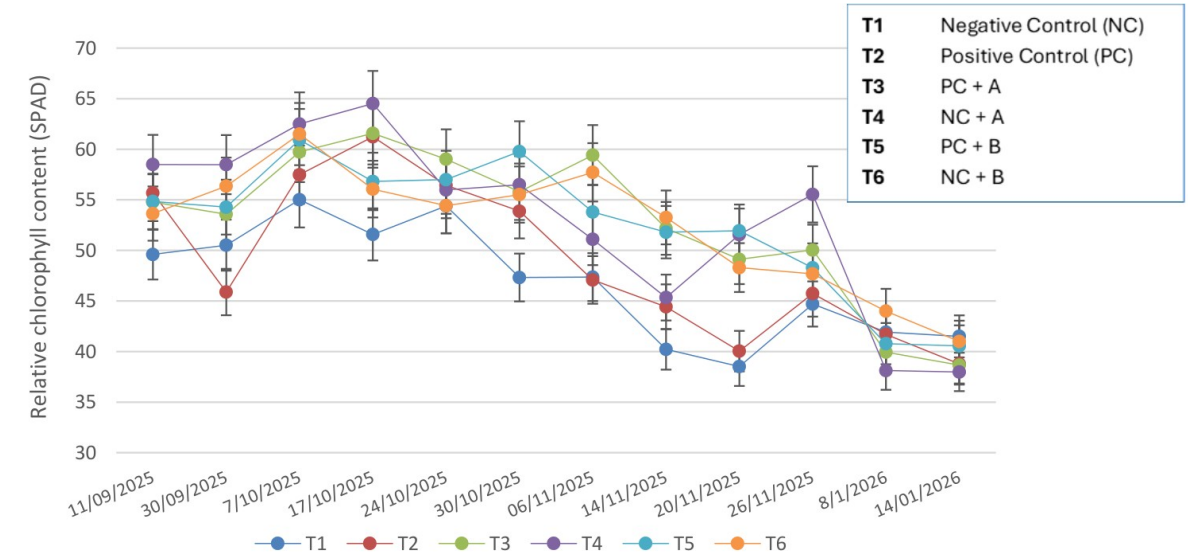


Figure 3.2.2: Relative chlorophyll content (SPAD) of cabbage in soil 2 in a pre-feasibility trial

All product treatments averaged 52.45-53.01 SPAD, compared with 46.89 in T1 and 49.03 in T2. At the final observation, values narrowed to 37.98-41.00 for product treatments. The growth-cycle greenness response supports physiological stimulation in clay soil. The smaller end-of-cycle separation shows why repeated observations add value to the interpretation.

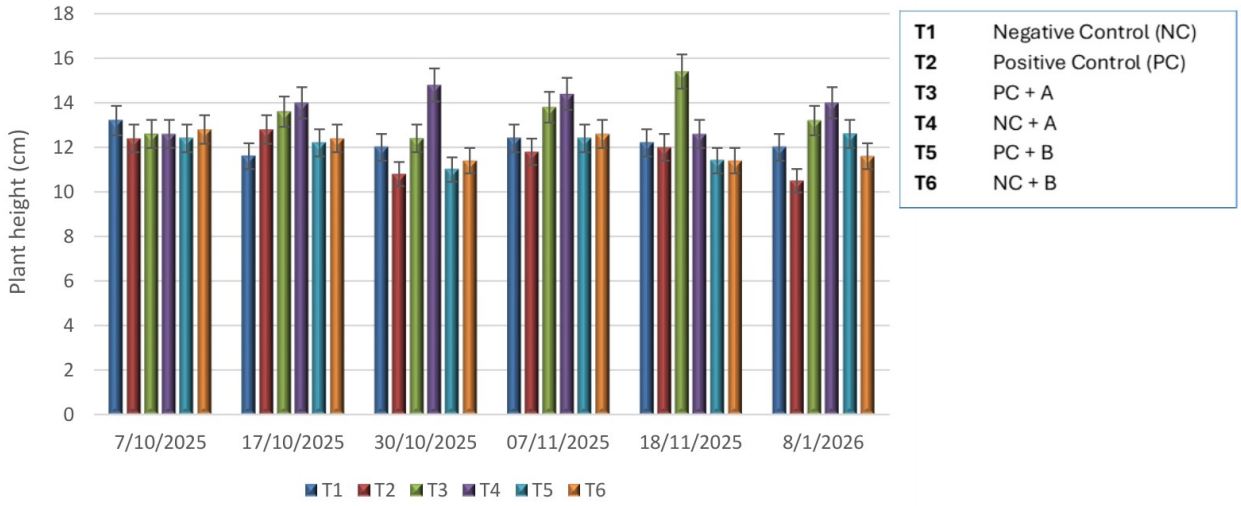


Figure 3.2.3: Plant height (cm) of cabbage in soil 1 in a pre-feasibility trial

Final height reached 13.2 cm in T3 compared with 10.5 cm in T2, and 14.0 cm in T4 compared with 12.0 cm in T1. T5 and T6 finished at 12.6 and 11.6 cm. The lower-dose A programme supported vegetative stature in both nutrition settings in Soil 1. Larger-dose responses were more modest.

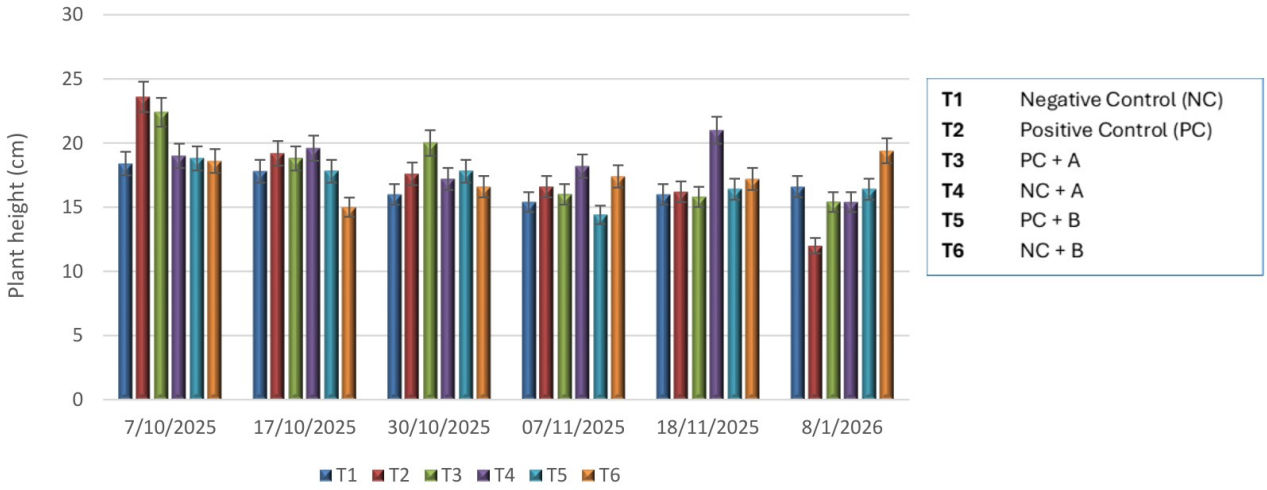


Figure 3.2.4: Plant height (cm) of cabbage in soil 2 in a pre-feasibility trial

T6 finished at 19.4 cm, compared with 16.6 in T1. T3 and T5 finished at 15.4 and 16.4 cm, compared with 12.0 in T2; initial heights differed considerably. The final measurements support favourable stature in several product comparisons. Height changes and harvest head mass provide complementary evidence because starting plant size was unequal.

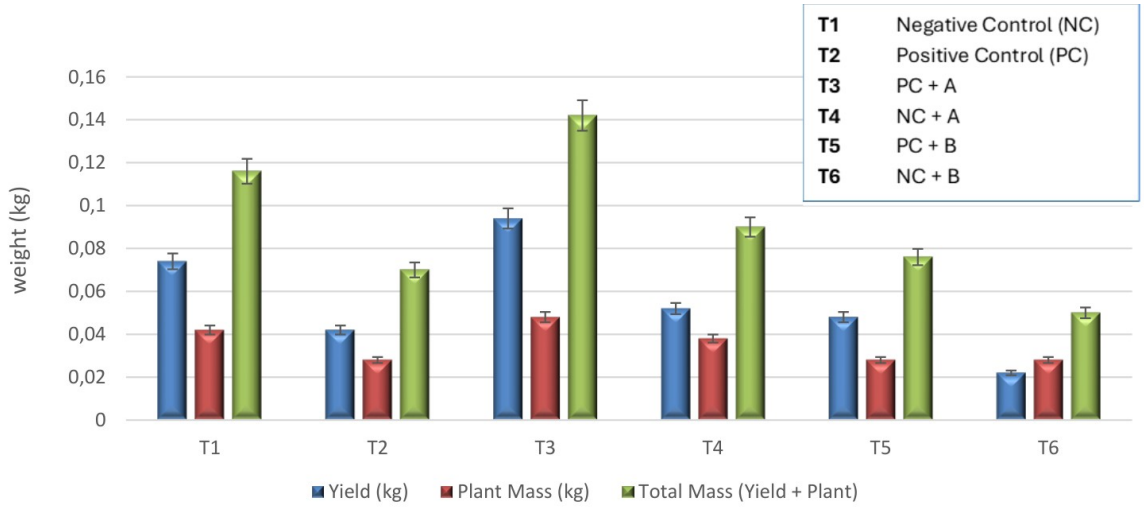


Figure 3.2.5: Cabbage yield (kg), Plant mass (residue) yield (kg), and total mass (kg) of cabbage at harvest in soil 1 in

a pre-feasibility trial

T3 head yield was 0.094 kg compared with 0.042 kg in T2, an increase of 123.8%. Its total head plus residue mass was 0.142 kg compared with 0.070 kg in T2; T4 remained below T1 for head mass. The A programme with fertilisation supported both harvestable head growth and total biomass in Soil 1. The combined evidence is particularly relevant to product efficacy in an integrated nutrition programme.

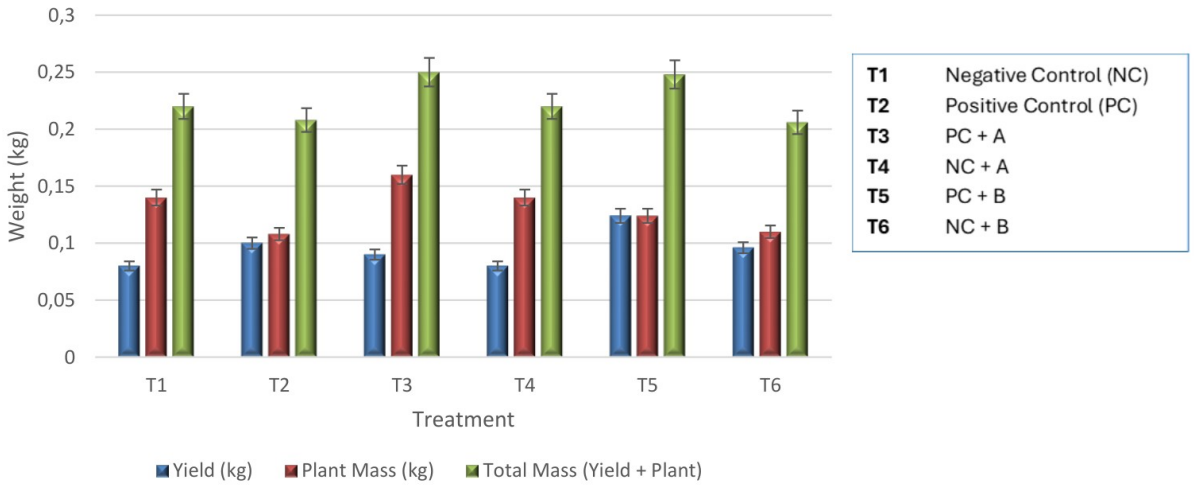


Figure 3.2.6: Plant mass (kg), yield (kg) and total mass (kg) of cabbage at harvest in soil 2 in a pre-feasibility trial

T5 head yield was 0.124 kg compared with 0.100 kg in T2, a 24.0% increase. T3 had the highest total mass at 0.250 kg, although its head mass was 0.090 kg. T5 favoured head allocation, whereas T3 favoured total biomass in clay soil. The distinction is useful when selecting a programme for a particular commercial harvest objective.

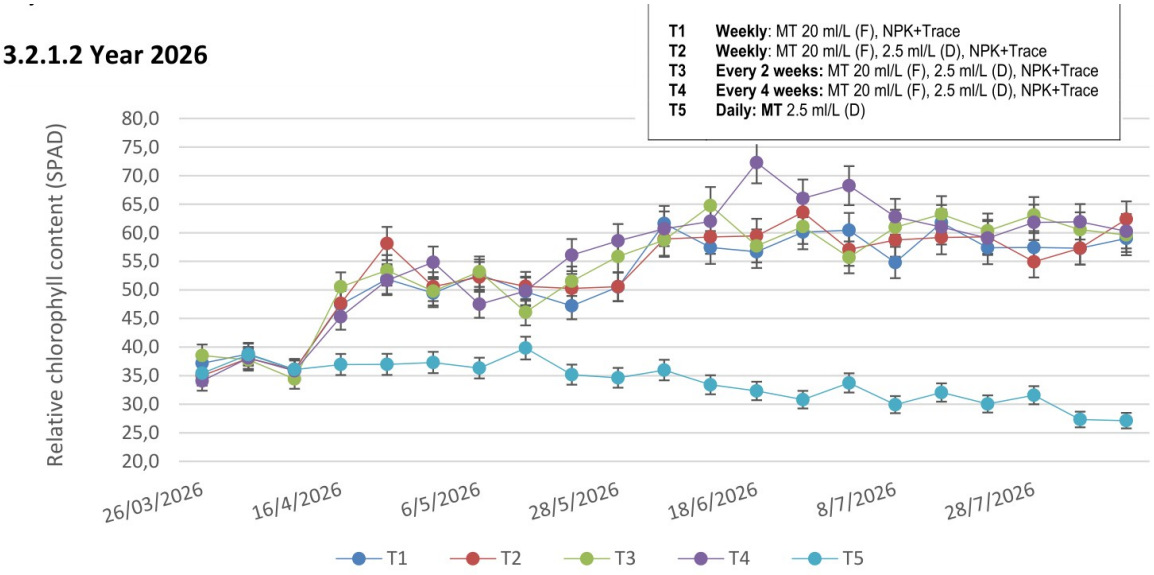


Figure 3.2.7: Relative chlorophyll content (SPAD) of cabbage

T1-T4 finished at 59.02-62.38 SPAD, while T5 finished at 27.12. T4 had the highest descriptive mean at 55.62 and the highest peak at 72.27. The fertilised programmes maintained strong greenness over the crop cycle. The low T5 readings indicate that Magtasium™ alone did not reproduce the physiological support of the complete nutrient programme.

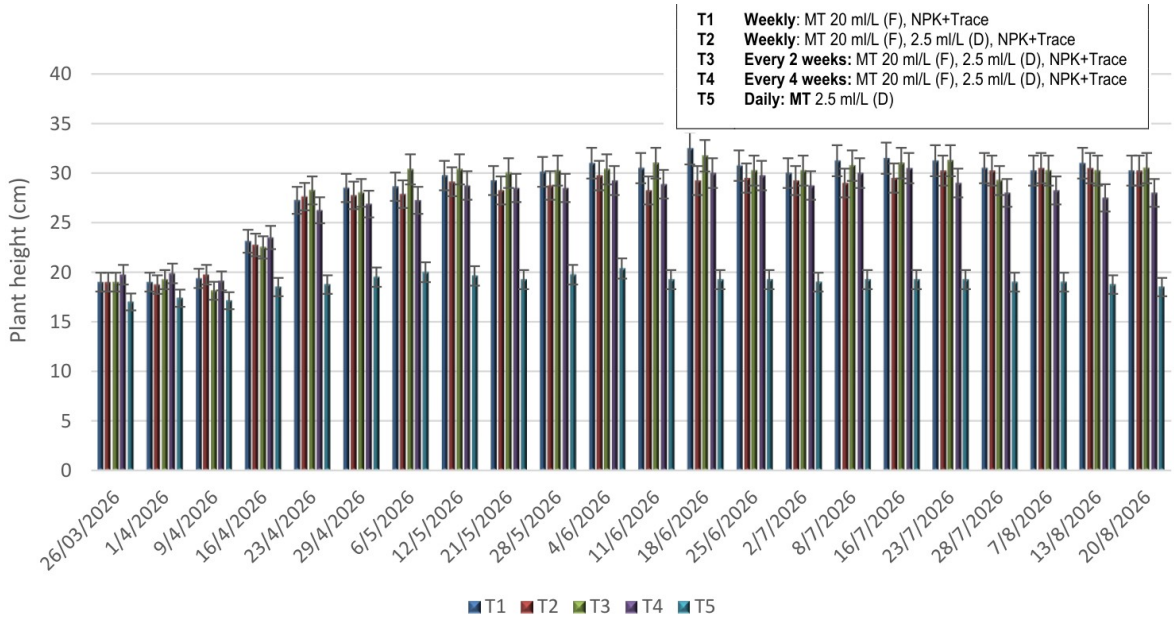


Figure 3.2.8: Plant height (cm) of cabbage

Final heights were 30.25, 30.25, 30.50 and 28.00 cm for T1-T4, compared with 18.50 cm in T5. Height differences among the fertilised programmes were relatively small. The similar stature of T1-T4 suggests that head development and biomass allocation are more discriminating than height for comparing these programmes.

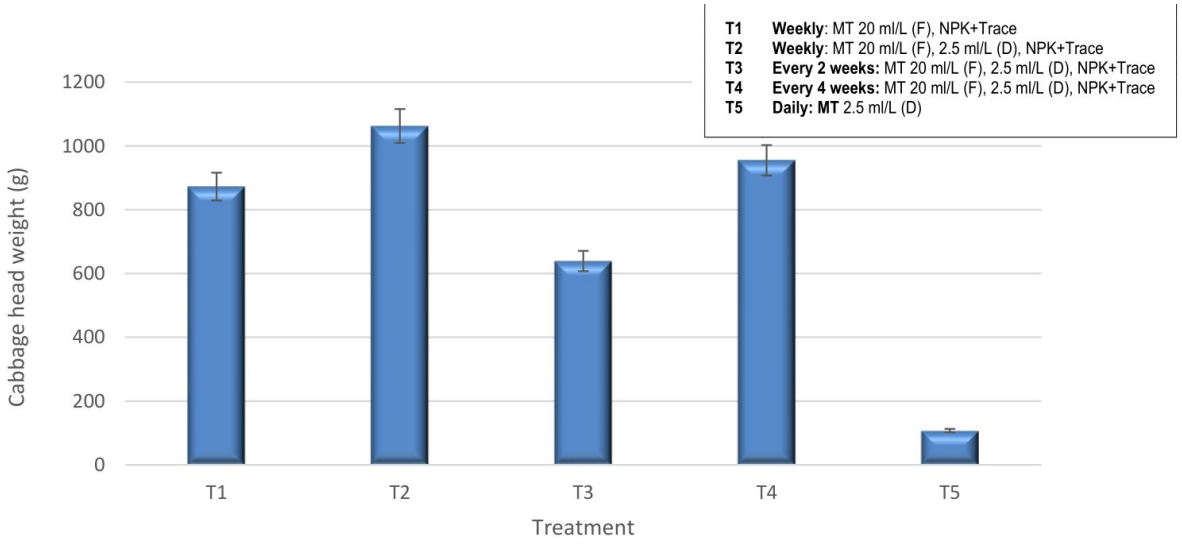


Figure 3.2.9: Cabbage head weight (g) at harvest

T2 had the highest head mass at 1,062.5 g, compared with 872.5 g in T1, a 21.8% difference under the same fertilisation regime. T4 reached 955 g; T5 was 107.5 g. Adding a weekly drench to the weekly foliar programme was associated with greater head mass. This supports integration of application routes with fertilisation in the tested cabbage programme.

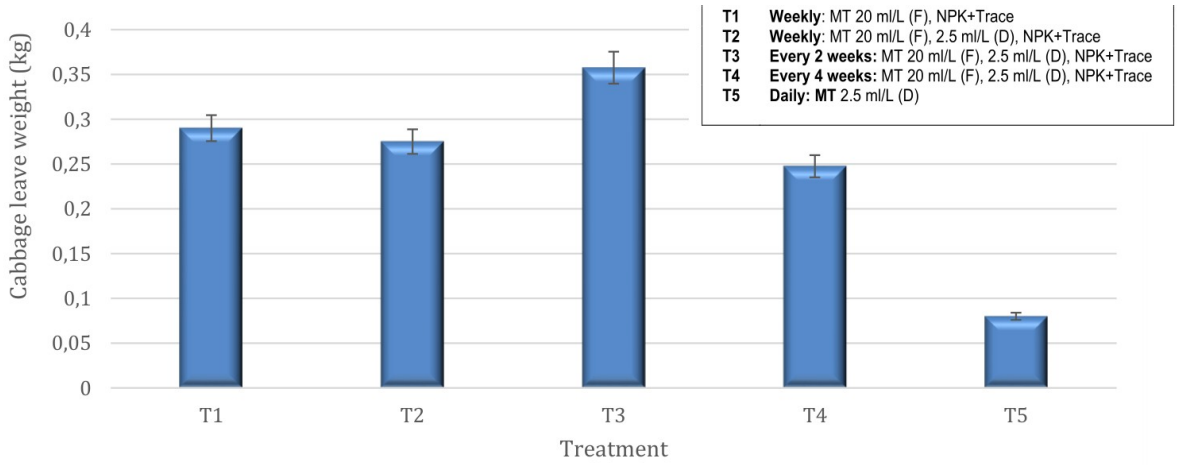


Figure 3.2.10: Cabbage leave weight (kg) at harvest

Leaf residue mass was highest in T3 at 0.3575 kg, compared with 0.2900 in T1 and 0.2750 in T2. T5 was lowest at 0.0800 kg. The programme producing most residual leaf mass was not the programme producing the heaviest head. Marketable yield and supporting vegetative biomass therefore need separate interpretation.

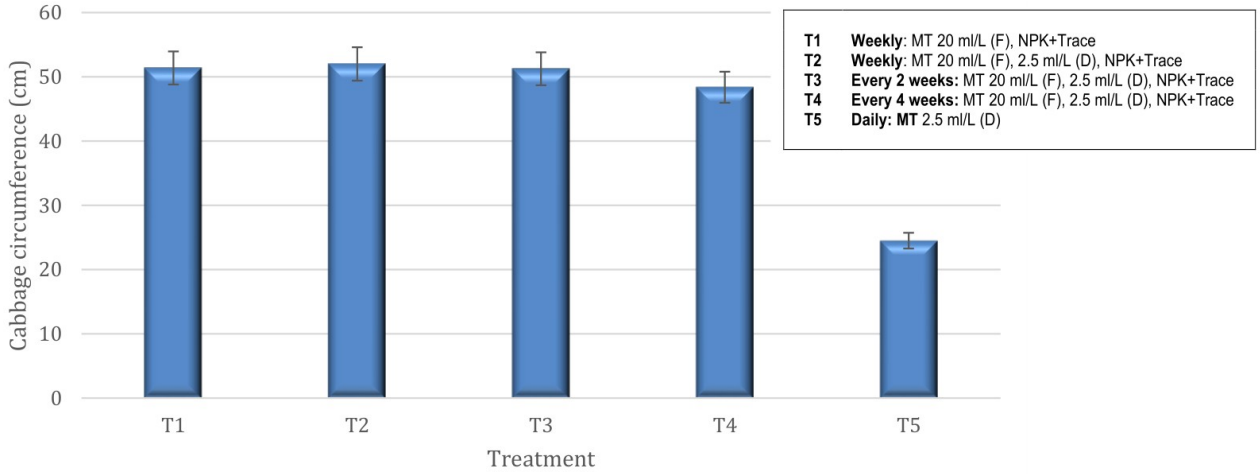


Figure 3.2.11: Cabbage circumference (cm) at harvest

Head circumference was 52.00 cm in T2, 51.38 in T1 and 51.25 in T3; T4 was 48.38 and T5 24.50 cm. The fertilised programmes maintained comparable head dimensions despite differing head masses. Circumference alone does not determine head density or saleable mass.

#### 3.2.1.3 Cabbage growth performance conclusion

Cabbage provides favourable efficacy evidence for Magtasium™ within an integrated fertilisation programme. In sandy loam, fertilisation plus dose A increased head mass by 123.8% relative to the fertilised control; in clay soil, dose B increased head mass by 24.0%. In 2026, the weekly combined programme produced the greatest head mass, 21.8% above the weekly foliar-only programme under the same fertilisation status. The different rankings for head and residue mass indicate that useful responses include changes in biomass allocation, not simply taller plants.

### 3.2.1.4 Visual observations (Cabbage)



**Figure A**: Randomised block design of cabbage trial



**Figure B**: Common visual effects of different treatments

# CORPORATE IDENTITY

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## SPECIALIZATION

Group 3 Bio Stimulant
(Trials Underway for Registration)

## STATUS

- Pending Worldwide Patent
- Conducting Trials

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# CONTACT INFORMATION


+ (27) 87 474 6149

www.halogengreens.com

info@halogengreens.com

- Roodepoort, Gauteng, South Africa (H/O)
- Tarlton, Gauteng, South Africa
- Somerset-West, Western Cape, South Africa
- Fredericton, New Brunswick, Canada


