

Lettuce summary PDF

A supplied summary of lettuce results. Use it as a navigation aid to the greenhouse material, not as independent evidence of a nitrate, tipburn or shelf-life effect.

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Editorial note

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[NanoImport — Editorial note ↗](#)

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Scientific and Technical Report: Comparative Analysis of the Effectiveness of ChitoHumus Dose C2 (0.2 L/ha) on an NPK Background

Research Location: Stende Research Center of the Institute of Agricultural Resources and Economics (AREI), "Dižzemes", Dižstende Commissioned by: SIA JIKO Ent Researchers: M.Sc. Agr. Solveiga Maļeckā, Scientific Assistant Margita Damškalne Research Object: Lettuce (*Lactuca sativa*), variety 'Lollo Bionda' Environment: Greenhouse cultivation in pots (1.47 L), peat substrate KKS.

1. Yield and Biometric Indicators

The application of ChitoHumus dose C2 on a mineral fertilizer (NPK) background improved all morphological parameters compared to the standard NPK control.

Indicator NPK Control NPK + C2 (0.2 L/ha) Improvement (%)

Green biomass per plant (g) 70.21 77.41 +10.3%

Plant length / leaf length (cm) 18.5 20.5 +10.8%

Number of leaves 12 13 +8.3%

Yield Conclusion

Adding the biostimulant at a dose of 0.2 L/ha makes it possible to exceed the productivity limit defined by mineral fertilization alone, increasing the marketable mass of lettuce by more than 10%.

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2. Mineral Composition and Nutritional Value (Quality)

The influence of ChitoHumus C2 on the plant's ability to accumulate essential minerals and nutrients is a key quality indicator.

Element / Indicator (Dry Matter

NPK Control NPK + C2 (0.2 L/ha) Change (%)

Basis)

Potassium (K), % 7.70 7.92 +2.9%

Calcium (Ca), % 0.52 0.60 +15.4%

Magnesium (Mg), % 0.68 0.79 +16.2%

Crude Protein, % 37.39 36.64 -2.0%*

Crude Fiber, % 12.79 12.96 +1.3%

*Note: The slight decrease in crude protein percentage concentration is associated with rapid biomass growth; however, the absolute protein yield per plant increased.

Emergent Conclusion

The increase in calcium and magnesium content by 15–16% is a critically important quality indicator. This enhances the nutritional value of the lettuce and may improve shelf life due to stronger cellular structures.

3. Additional Indicators and Root System

The study also demonstrated stability in other plant development parameters:

● Dry matter content:

In the NPK C2 variant, dry matter content reached 5.01%. ● Root system length:

In the NPK C2 variant, root length reached 20.65 cm (compared to 20.50 cm in the control). ● Stem diameter:

The NPK C2 variant recorded a stem diameter of 0.96 mm.

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Final Conclusion

The integration of ChitoHumus at a dose of 0.2 L/ha (C2) into lettuce cultivation technology on an NPK background provides the following confirmed advantages:

1. Yield Increase:

Increase in marketable biomass by 10.3%. 2. Visual Quality:

Increase in leaf length by 2 cm and formation of denser rosettes. 3. Mineral Enrichment:

Significant increase in magnesium (+16.2%) and calcium (+15.4%) content, making the product more competitive in the healthy food market.

Confirmed by: AREI Stende Research Center, 2025.