

Pea summary PDF

A supplied summary of pea observations. The full evidence remains protocol-specific and should not be generalized to other crops.

Full text and tables in the selected language. Automatic translation with terminology and numerical checks; not a certified translation. Author statements, including disputed claims, are retained. Editorial notes are separate.

Editorial note

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[NanoImport — Editorial note ↗](#)

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Scientific Report: Evaluation of the Effectiveness of the ChitoHumus Bioproduct in Pea Crops (Series 1 and 2)

Research Period: 2025 Location: AREI Stende Research Center, Latvia Research Object: Field peas (*Pisum sativum*), varieties 'Casablanca' and 'Salamanca' Objective: To compare the effects of ChitoHumus doses (0.1 and 0.2 L/ha) on biomass and quality indicators under different agrotechnical conditions.

1. First Experimental Series (Variety 'Casablanca')

The experiments were conducted in peat substrate (KKS) using 5.7 L pots. Harvesting was performed at the beginning of the flowering stage.

1.1. Quantitative Biomass Indicators

The application of ChitoHumus on a mineral fertilizer (NPK) background caused a significant increase in vegetative biomass:

● Variant NPK + C2 (0.2 L/ha):

Total green biomass increased by 33.9% compared to the control. ● Individual productivity:

The average biomass per plant in the NPK + C2 variant reached 31.08 g, which is 224.3% of the control value (13.86 g).

This confirms the synergistic effect of the bioproduct and mineral fertilizers.

1.2. Emergent Mineralization and Quality Effects (Without NPK Background)

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The most significant qualitative changes (“indicator jumps”) were observed in variants without mineral fertilizer application, where ChitoHumus acted as a catalyst for mobilizing poorly available elements.

Phosphorus Increase

- Phosphorus content in dry matter increased from 0.159% (control) to 0.673% (C1 variant).
- Net concentration increase: 323% (4.23-fold increase).

Potassium Mobilization

- Potassium content increased from 1.97% to 4.60% (C1 variant), representing a 133% increase.

Protein Expression

- Simultaneous increase in crude protein concentration from 17.82% to 25.04% (+40.5%), while plant biomass increased by 69%.

This creates a cumulative effect on total protein yield per unit area.

1.3. Nutritional Value (Structural Carbohydrates)

A significant improvement in biomass digestibility was observed due to the reduction of cell wall fractions:

- ADF (Acid Detergent Fiber): decreased by 14–24%
- NDF (Neutral Detergent Fiber): decreased by 15–17%

This indicates that ChitoHumus redirects plant metabolism toward nutrient synthesis rather than the formation of coarse structural tissues.

2. Second Experimental Series (Variety ‘Salamanca’)

The experiments were conducted in field soil with and without nitrogen fertilization (N30).

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2.1. Morphological Stimulation

Application of the bioproduct caused changes in plant architecture:

- Biomass increase:

Green biomass increased by 18.8–27.6% ● Shoot length:

Plant height increased by 15–18.5% ● Reproductive organs:

Additional tendril formation — on average +1 per plant, correlating with the overall photosynthetic capacity.

2.2. Root System Development (Emergent Result)

Under soil conditions, ChitoHumus demonstrated pronounced rhizogenic activity.

Root Biomass

● In the N + C2 variant (nitrogen + 0.2 L/ha), root biomass increased by 44%

(from 7.68 g to 11.06 g).

Linear Root Length

● Root system length increased by 20.6%

(from 22.95 cm to 27.68 cm).

Specific Effect

● An increase in dry matter content in roots was observed

(from 10.64% in the control to 16.32% in the N + C2 variant),

indicating denser and more developed vascular structures.

3. Conclusions and Scientific Findings

The conducted studies revealed the following key patterns of ChitoHumus action:

1. “Deficit Activation” Effect

Maximum phosphorus (+323%) and potassium (+133%) concentration increases were

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observed under poor agrochemical backgrounds. ChitoHumus emergently increases the bioavailability of mineral elements, turning the plant into a more efficient “nutrient pump.” 2.

Protein Synergism

The bioproduct overcomes the standard biological correlation in which biomass growth usually causes a decrease in protein concentration (“dilution effect”). In this case, simultaneous increases in both biomass and protein concentration were recorded. 3. Root Expansion

In soil environments, the preparation acts as a powerful rhizogenesis stimulator (+44% root biomass), ensuring stress resistance and long-term plant nutrition. 4. Qualitative Transformation

Reduction of ADF/NDF indicators against the background of increased mineralization makes the product more valuable from the standpoint of zootechnical standards.

To confirm the identified unusually high phosphorus and protein indicators, additional large-scale field trials are recommended.