

Potato summary PDF

A supplied potato summary. Claims about marketable yield, disease reduction or starch require independent confirmation beyond the reported trial.

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Editorial note

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Scientific Report: Effect of the ChitoHumus Biostimulant on Potato Yield and Quality (Variety 'Paroli')

Location: AREI Stende Research Center, Latvia (2025) Research Object: Early potatoes, variety 'Paroli' Methodology: Double spraying of potato crops with ChitoHumus at a rate of 0.2 L/ha (variant NPK C2) compared to the control variant (NPK without biostimulant).

1. Meteorological Conditions During the 2025 Growing Season

The 2025 season was characterized by abnormal weather conditions that created significant stress for potato cultivation.

Temperature Conditions

● Spring was among the warmest on record (10th warmest since 1924). ● March (+3.8°C) and April (+7.4°C) significantly exceeded long-term averages. ● However, May turned out to be cold (+9.4°C, which is 2.0°C below normal), becoming

the coldest May of the century. ● Summer remained cool: temperatures in June and August were 0.7–1.0°C below

average.

Precipitation (Critical Excess Moisture)

● The summer of 2025 became the wettest since 2016. ● In July, precipitation reached 129.7 mm (166% of normal levels). ● On certain days (July 23), rainfall reached up to 39.1 mm in a single day.

Impact on Yield

- Excessive moisture combined with a cool August promoted the spread of rot diseases (especially *Xanthomonas* spp.) and pest activity (wireworms and cutworm larvae).

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- Under such conditions, the role of the biostimulant in improving plant immunity and tuber quality became critical.

2. Comparative Analysis: NPK Control vs NPK C2 (0.2 L/ha)

Application of ChitoHumus at a rate of 0.2 L/ha on top of mineral fertilization provided a pronounced positive effect on yield structure and chemical composition.

2.1. Marketability of Production

One of the most significant results was the sharp increase in the share of marketable tubers (fraction suitable for commercial sale).

- NPK Control: marketable tuber share was 49.8%. ● NPK C2: marketable tuber share increased to 87.1%. ● Increase: net increase in marketable yield reached +37.3%.

This means that almost the entire harvest in the test variant met commercial quality standards, whereas in the control group, nearly half of the tubers were classified as waste or undersized fractions.

2.2. Tuber Weight and Structure

- Average weight per plant cluster:

The NPK C2 variant reached 2.079 kg, which is 10.9% higher than the control group (1.875 kg). ● Average marketable tuber weight:

The test variant demonstrated a more uniform tuber fraction, which under the excessively wet conditions of 2025 prevented excessive tuber enlargement and water accumulation without proper structure formation.

2.3. Crop Health (Disease Reduction)

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Despite the high disease pressure in 2025 (*Xanthomonas* rot), the biostimulant improved plant resistance:

Number of Diseased/Damaged Tubers (per 4 plants)

- Control (NPK): 7 tubers ● Variant C2 (NPK C2): 4 tubers

Effect

- The number of damaged tubers was reduced by nearly 2 times.

3. Starch Accumulation Indicators

ChitoHumus had a strong effect on the plant's energy metabolism, which was reflected in carbohydrate accumulation.

Starch Content in Tubers

- NPK Control: 10.27% ● NPK C2: 14.72% ● Increase: relative starch content increased by +43.3%.

Starch Yield per Hectare

- NPK Control: 4.85 t/ha ● NPK C2: 7.02 t/ha ● Difference: additional starch yield amounted to 2.17 tons per hectare.

Conclusion

Double spraying of the potato variety 'Paroli' with the ChitoHumus biostimulant (0.2 L/ha) under the extreme conditions of 2025 made it possible to:

1. Increase the commercial value of the harvest by raising the share of marketable tubers from 49.8% to 87.1%.

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2. Achieve a significant increase in starch content, adding 2.17 t/ha of pure carbohydrate yield.
3. Reduce losses from rot diseases and pests by nearly half, strengthening the plant's immune barrier.