

MODIFICATIONS OF VITAMIN C AND TOTAL PROTEIN CONTENT IN EDIBLE POTATO TUBERS UNDER THE INFLUENCE OF HERBICIDE AND BIOSTIMULANTS

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INTRODUCTION

The objective of the research was to evaluate the effect of herbicide and herbicide with various biostimulants on the content of vitamin C and total protein in edible potato tubers.

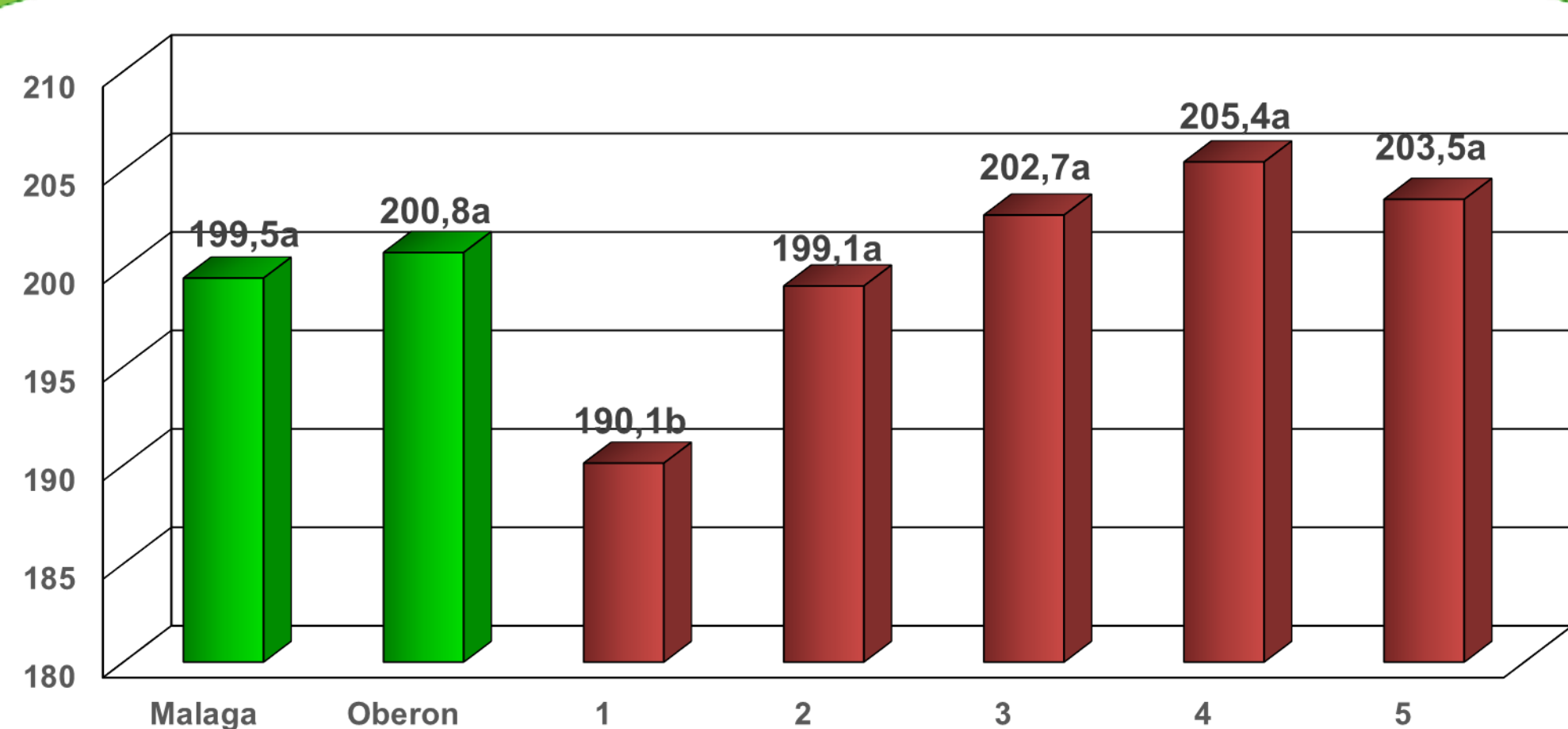


Fig. 1. The content of vitamin C in potato tubers

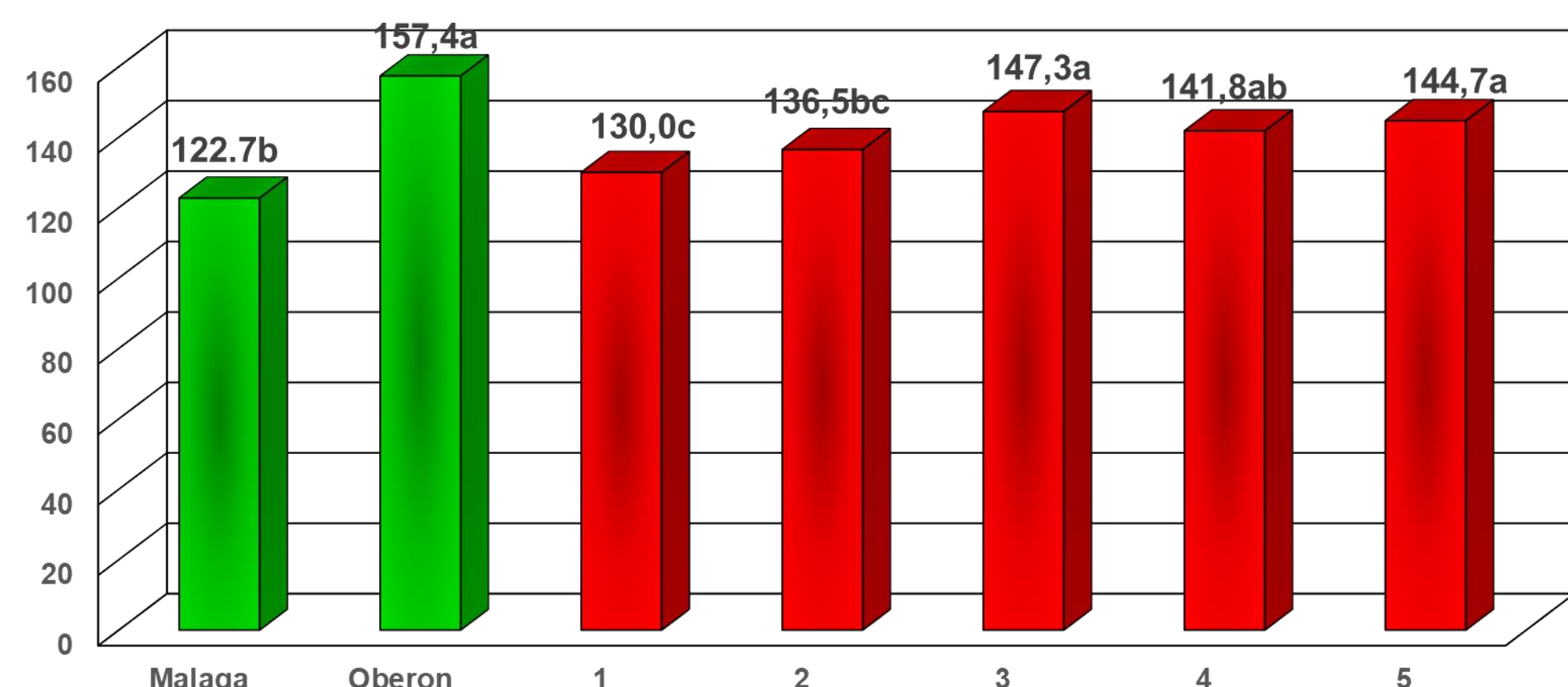


Fig. 2. The content of total protein in potato tubers

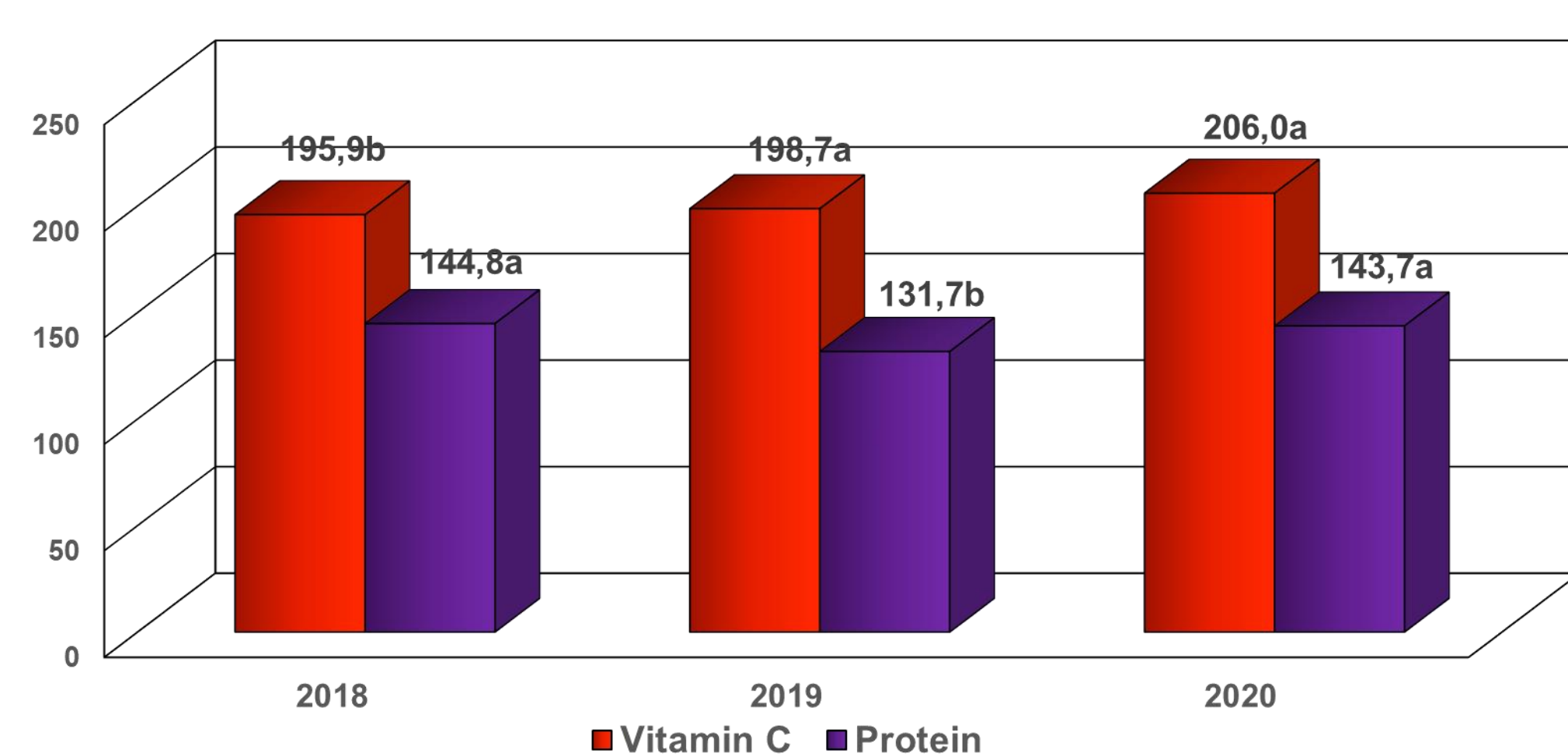


Fig. 3. The content of vitamin C and total protein in potato tubers in the research years

MATERIAL AND METHODS

The research material consisted of potato tubers from a three-year field experiment. The experiment was established by method split-plot pattern, in triplicate. The first factor was the two edible potato cultivars 'Malaga' and 'Oberon', and the second factor was the five methods of weeds regulation with the use of herbicide and biostimulants (Tab. 1). Vitamin C content in fresh tubers was determined using the Tilman's method modified by Pijanowski. Content of total protein was calculated from the content of nitrogen multiplied by 6.25, assayed with the Kjeldahl method. The research results of this experiment was statistically analysed using with analysis of variance. The significance between the means was evaluated with the Tukey's test at the significance level of $p \leq 0.05$.

Table 1. Factors of the experiment

Factor I – cultivars of potato

1. Oberon, 2. Malaga

Factor II – methods of herbicide and herbicide application with biostimulants (objects)

1. Control object – mechanical weeding – without herbicide and biostimulants
2. Avatar 293 ZC (clomazone+metribuzin) at a dose of $1.5 \text{ dm}^3 \cdot \text{ha}^{-1}$
3. Avatar 293 ZC (clomazone+metribuzin) at a dose of $1.5 \text{ dm}^3 \cdot \text{ha}^{-1}$ and biostimulant PlonoStart at a dose $2.0 \text{ dm}^3 \cdot \text{ha}^{-1}$
4. Avatar 293 ZC (clomazone+metribuzin) at a dose of $1.5 \text{ dm}^3 \cdot \text{ha}^{-1}$ and biostimulant Aminoplant at a dose of $1.5 \text{ dm}^3 \cdot \text{ha}^{-1}$
5. Avatar 293 ZC (clomazone+metribuzin) at a dose of $1.5 \text{ dm}^3 \cdot \text{ha}^{-1}$ and biostimulant Agro-Sorb-Folium at a dose of $4.0 \text{ dm}^3 \cdot \text{ha}^{-1}$

PlonoStart - contains: min.: N_{total} - 16,4%, K_2O - 0,75%, CaO - 0,07%, MgO - 0,02%, S - 941 mg kg^{-1} , lactic acid bacteria, actinomycetes;

Aminoplant – contains: N_{total} - 9,48%, N_{organic} - 9,2%, $N\text{-NH}_4$ - 0,88%, C_{organic} - 25%, free amino acids - 11,57%, organic matter - 87,7%;

Agro-Sorb-Folium – contains: N_{total} - 2,2%, B - 0,02%, Mn - 0,05%, Zn - 0,09%, total amino acids - 13,11%, free amino acids - 10,66%

RESULTS

- The highest vitamin C accumulation followed an application of the herbicide Avatar 293 ZC + the biostimulant Aminoplant whereas total protein content was the highest after spraying with the same herbicide + the biostimulant PlonoStart.
- Cv. Oberon displayed a higher potential for an accumulation of chemical components in tubers compared with cv. Malaga.
- The analyses conducted in the study demonstrated a significant effect of meteorological conditions throughout the study years on the concentration of the chemical components of potato tubers examined in the research.

