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DEEP TILLAGE AS A BASIC PREREQUISITE FOR INCREASING THE YIELD OF LETTUCE IN GREENHOUSES

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INTRODUCTION & AIM

In conditions of intensive greenhouse vegetable production, lettuce production during the winter without heating occupies a significant place in the crop rotation after tomatoes, peppers, and cucumbers. In addition to being profitable, this type of salad production provides the benefits of phytoextracting excess nutrients and eliminating pathogens and weeds.

The aim of this research was to investigate the effects of different tillage treatments and organic fertilizers on the growth, development, and yield of lettuce (*Lactuca sativa* L.).

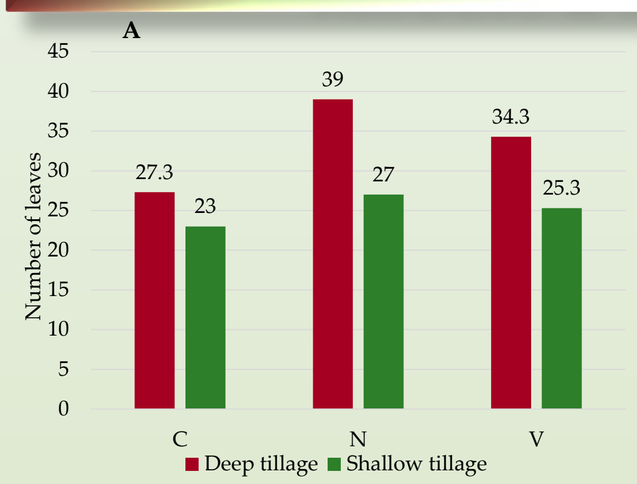
METHOD

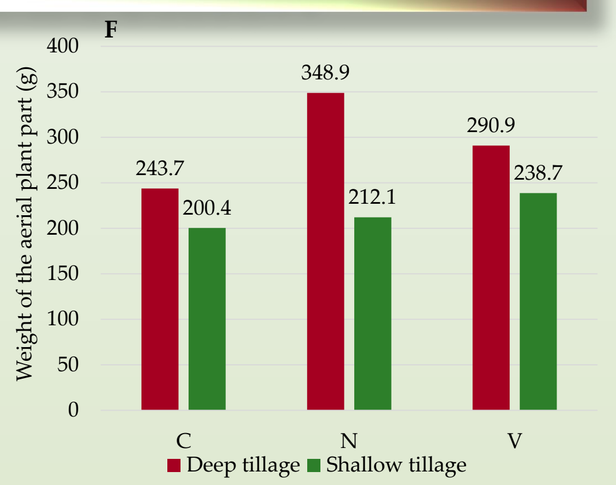
The research was performed at the Institute for Vegetable Crops in Smederevska Palanka and a purple variety of leafy lettuce - Viola was chosen as plant material. The experiment followed a random block system with three repetitions in the irrigation system and two types of cultivation - deep tillage (50 cm) and shallow tillage (15 cm). Lettuce was planted at a spacing of 20×25 cm. In both cases of soil cultivation, two types of organic fertilizers were separately applied following the manufacturer's instructions: 1) vermicompost - Lumbrikum Radovanović (V); 2) briquetted chicken manure - Nervosol organic NPK 4-3-4 (N). The control (C) involved soil cultivation without fertilizer application.

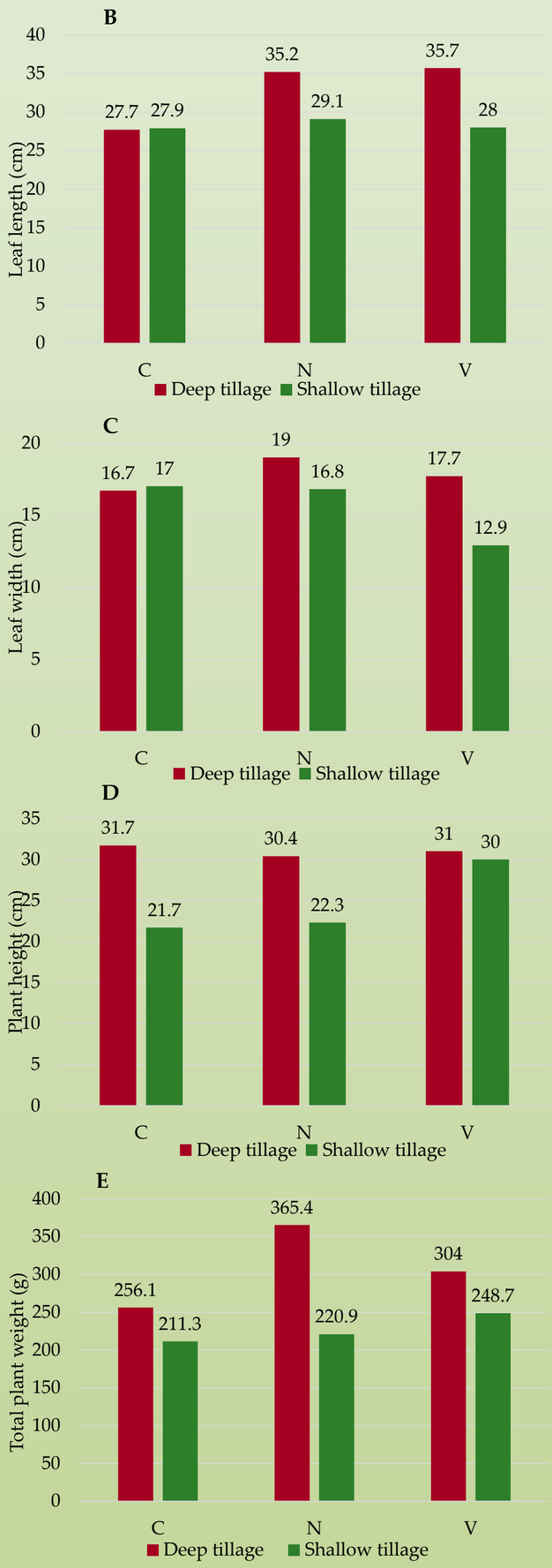
A two-factor ANOVA analysis model was used to determine the influence of the tillage treatments and two organic fertilizers on the lettuce morphological parameters and yield. Duncan's test was performed to stipulate the significance of mean differences ($p < 0.05$) between the tillage treatments and applied organic fertilizers using SPSS software version 22.0 (IBM Corporation, New York, NY, USA).

Figure 1. The experiment in the greenhouse

RESULTS & DISCUSSION







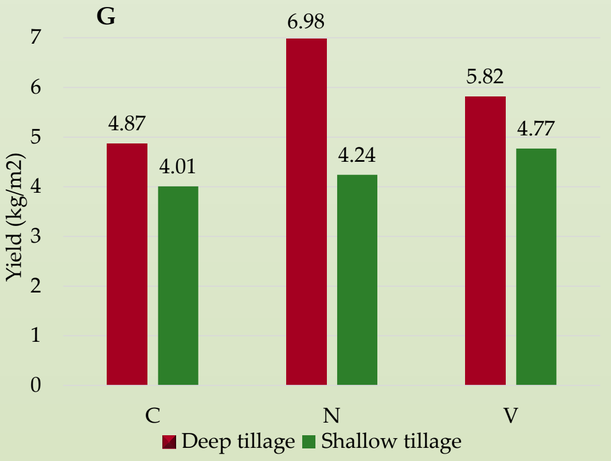


Figure 2. Average values of the number of leaves (A), leaf length (B), leaf width (C), plant height (D), plant weight (E), aerial plant part weight (F), and the lettuce yield (G) grown under deep tillage and shallow tillage, with the application of organic fertilizers Nervosol (N) and vermicompost (V), compared to the control (C).

Figure 3. The appearance of lettuce grown under deep tillage and shallow tillage, with the application of organic fertilizers Nervosol (N) and vermicompost (V), compared to the control (C).

CONCLUSION

Deep tillage, combined with the usage of Nervosol organic NPK 4-3-4, has been shown to be an effective method for increasing lettuce yield compared to shallow tilling control. In situations where deep tillage is not possible, the usage of vermicompost is a good alternative.

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