

Effect of different methods of sward renovation on selected physical and chemical soil properties

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INTRODUCTION

- The objective of this work was to evaluate the effect of different renovation methods on the selected physical and chemical properties of organic soil.

METHODS

Site: Brody Experimental Station (52° 26' N, 16° 18' E) – old meadow on organic soil;

Investigations: 2006 (year of renovation) - 2008;

Experiment: random block design, 3 repl., treatments (1/without renovation (**no renov.**); 2/old sward preparation by low cutting (**OSC**) at the height of 3 cm and overdrilling (**OD**); 3/soil preparation by rototiller (**RT**) and overdrilling (**OD**); 4/spraying with glyphosate (**SG**) and direct drilling (**DD**); 5/ploughing (**PL**) and reseedling (**RS**))

Evaluation: physical properties (soil moisture, bulk density, capillary water capacity and porosity), chemical properties (electric conductivity, content of water soluble K⁺, NO₃⁻ and PO₄⁻³ in soil solution)

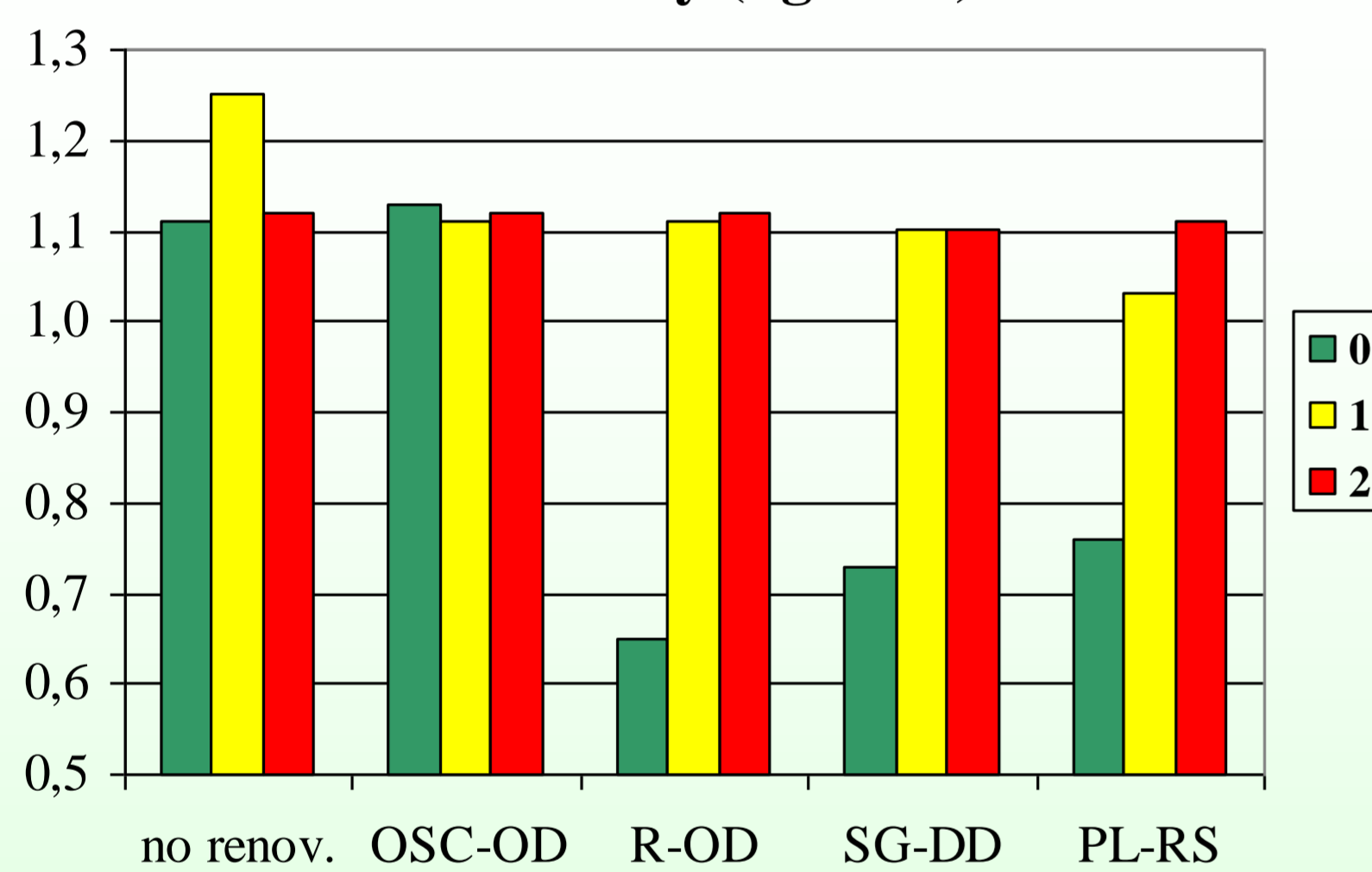


Experiment in the first year after renovation

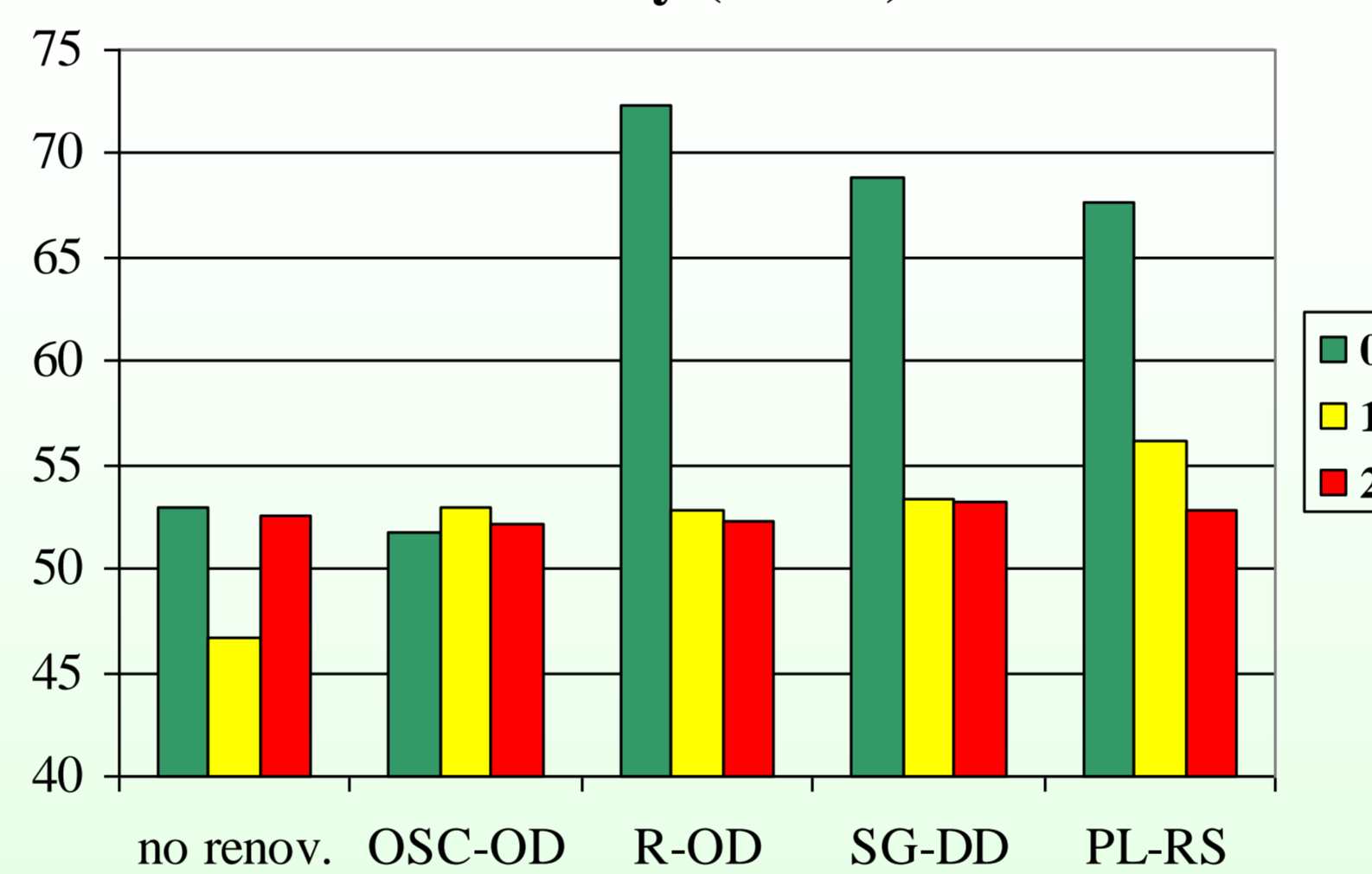
RESULTS

Physical and chemical soil properties in soil layer 5-10 cm depending on methods of sward renovation in years after renovation (0, 1, 2)

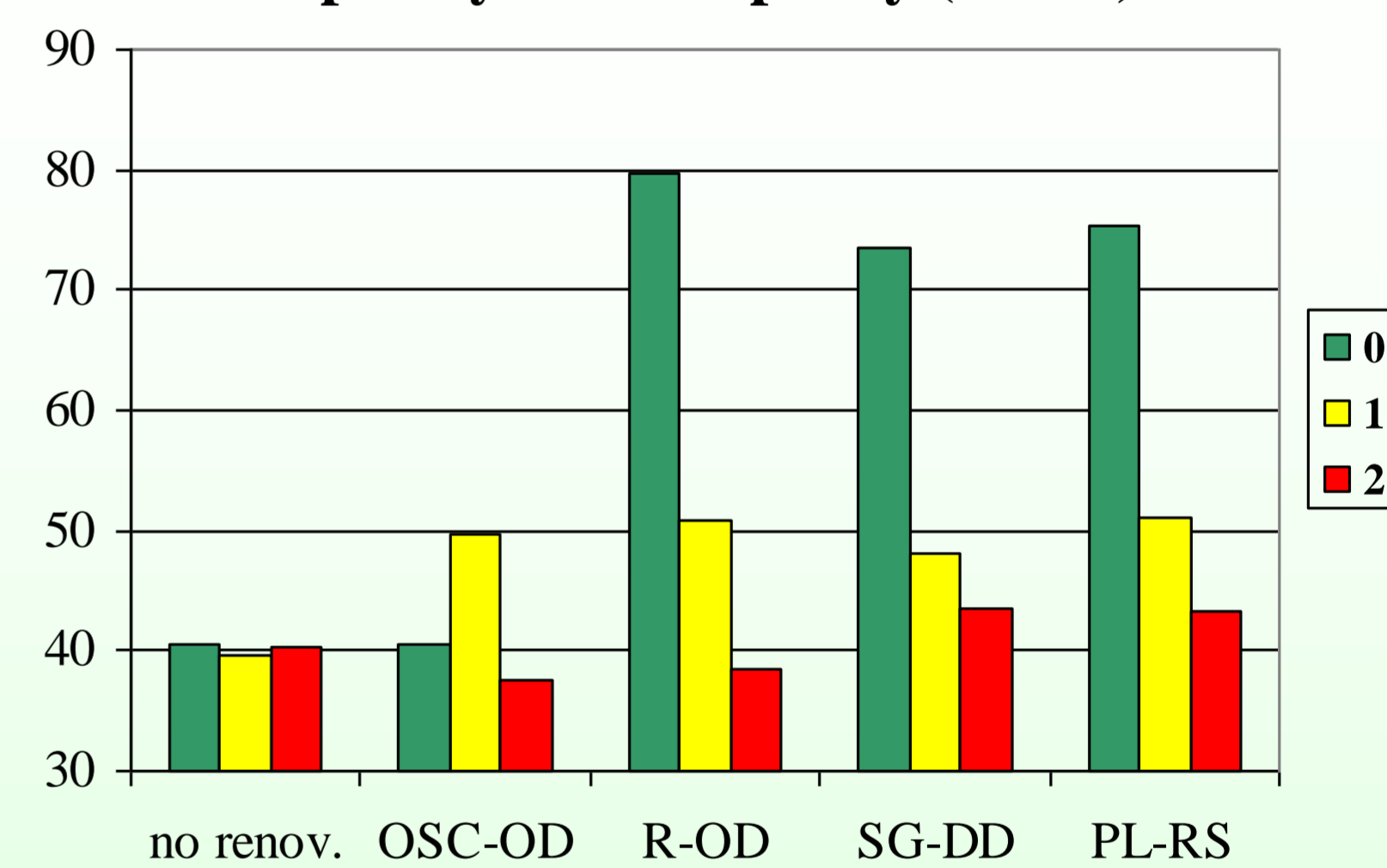
Bulk density (kg dm⁻³)



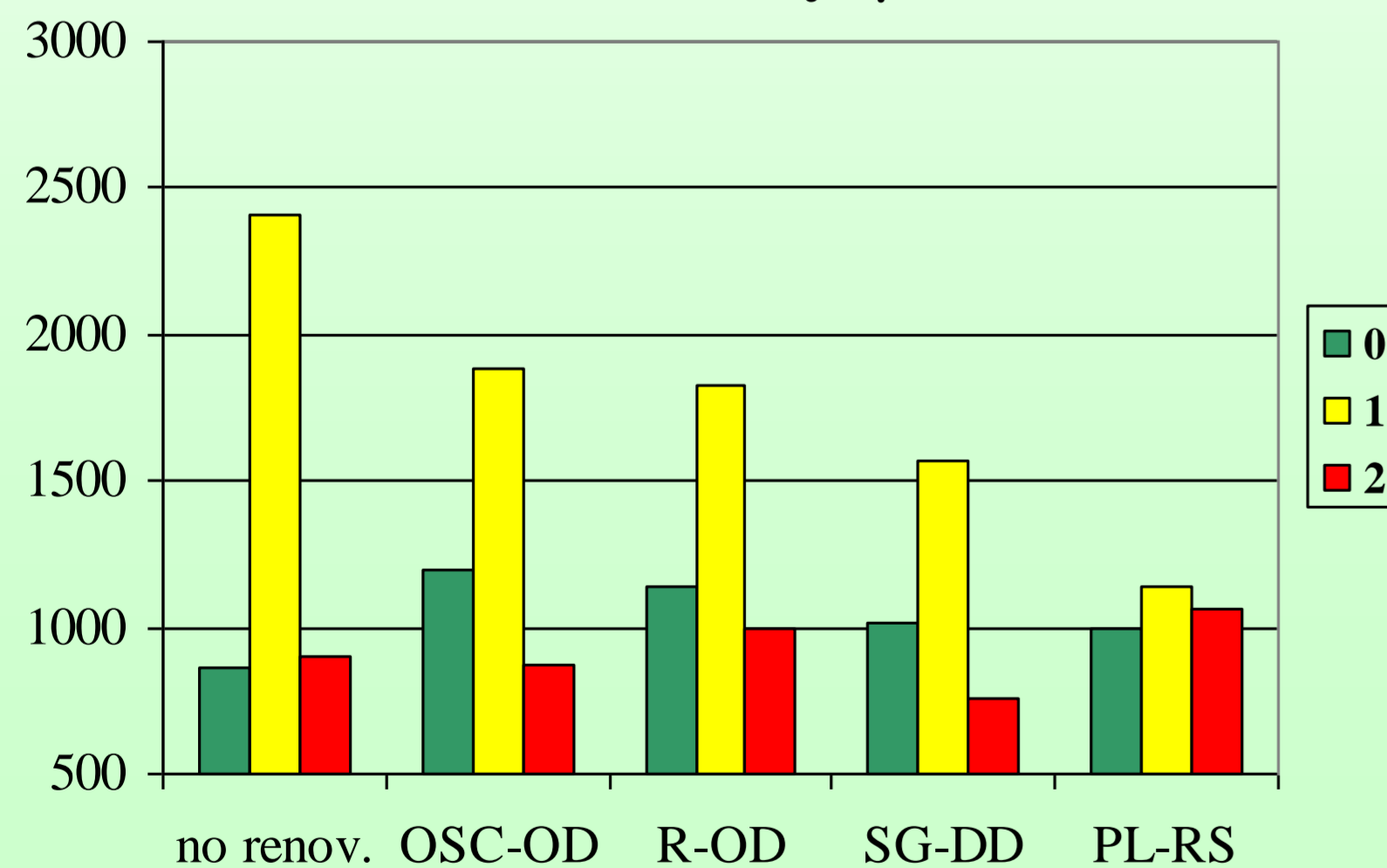
Porosity (% v/v)



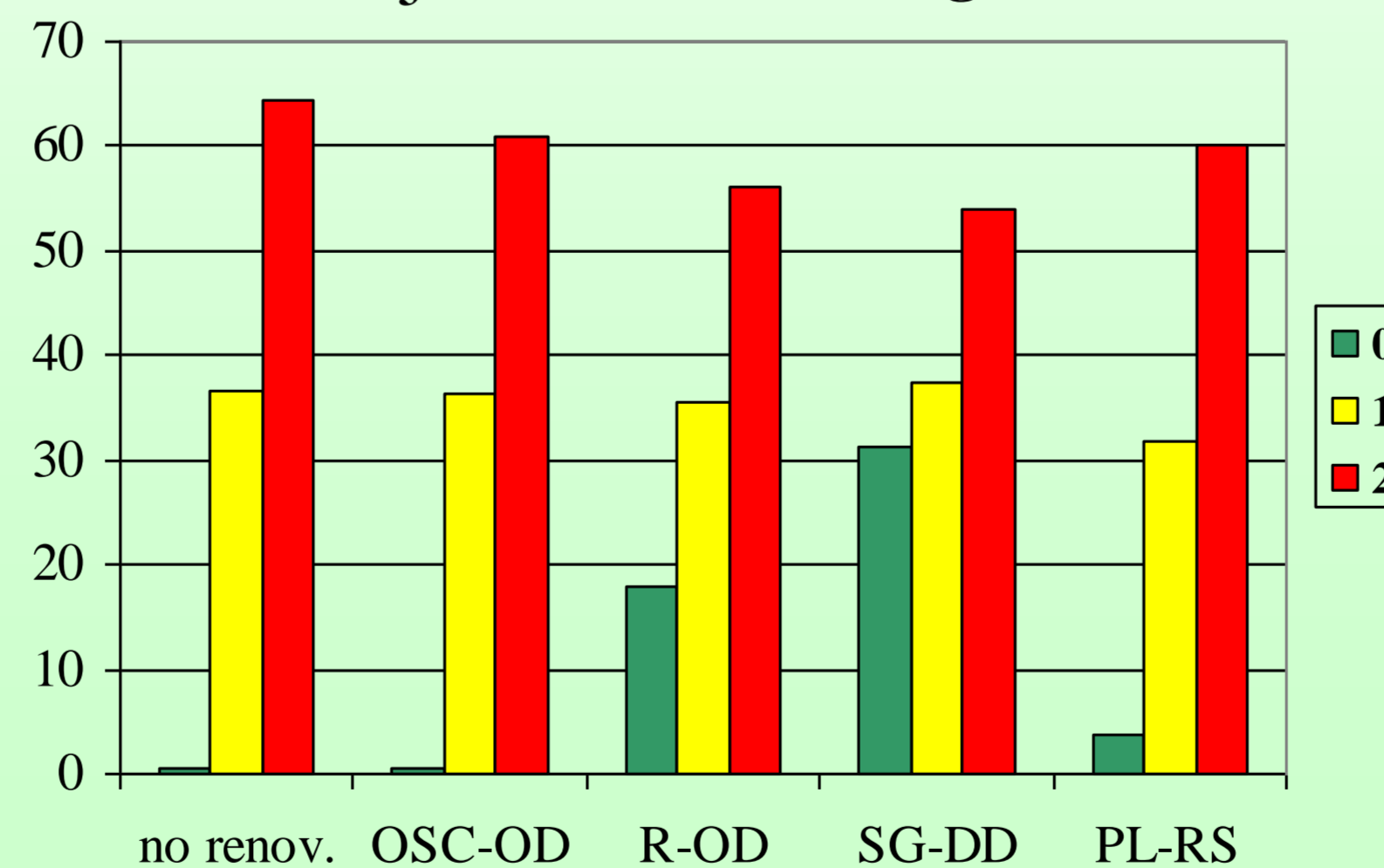
Capillary water capacity (% v/v)



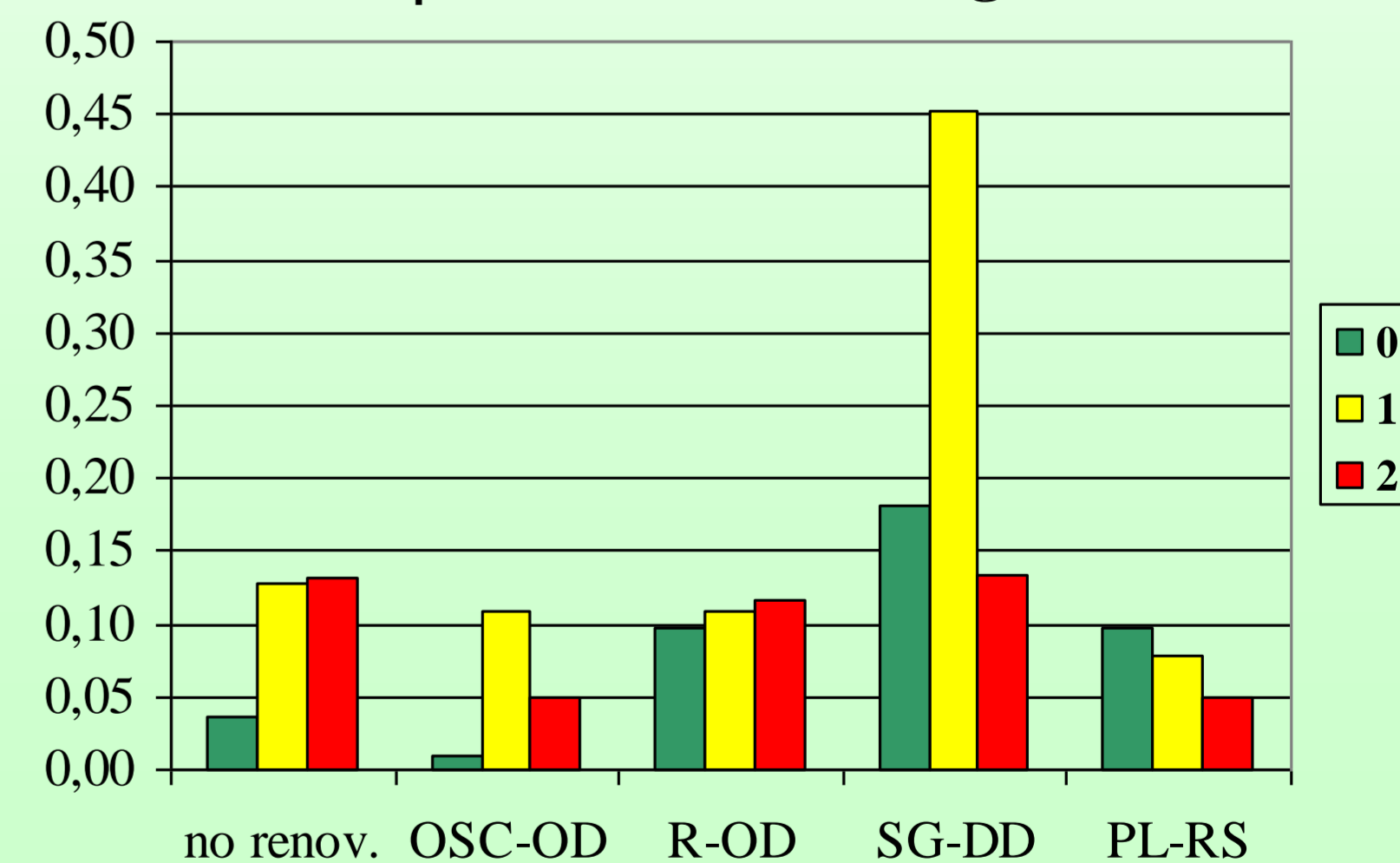
Electric conductivity (μS cm⁻¹)



N-NO₃⁻ in soil solution (mg dm⁻³)



P-PO₄⁻³ in soil solution (mg dm⁻³)



CONCLUSIONS

- Overdrilling carried out in low cut sward is a method which impacts only the surface soil layer.
- In the case of direct drilling, the increase of porosity, water capillary capacity and the content of nitrate in the soil solution were found. Other renovation methods, like ploughing with reseedling and rototiller with overdrilling influenced physical soil properties to a greater extent.
- It is clear from the obtained analysis that soil loosening and its aeration during renovation leads to increased nitrate leaching and improved conductivity in the soil solution.