

## THE FORM OF NITRATES AT THE LEVEL OF THE HORTICULTURAL PROFILE OF THE SOIL UNDER THE TOMATOES CULTURE ON THE FIELD

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### **Abstract**

*The performed researches concerning the form of the nitrates at the level of the horticultural profile emphasized maximum concentration of this anion in the superficial layer of the soil, at a depth of 10-20 cm during autumn- winter season, and after plantation and the subsequent pheno-phases its utmost level moves to the depth of the soil profile. At the end of the vegetation's period, respectively during the final harvests, the utmost level of nitrate's concentration is found at the base of the soil's profile, near outside the edaphic volume explored by roots.*

**Key words:** profile of the soil, nitrates, the dynamic of the nitrates, nitrates's concentration, tomatoes.

### **INTRODUCTION**

The nitrates represent an important source of mineral nitrogen for soils and plants that can be found in this environment not only from applied fertilized resources but also as an outcome of the nitrification process resulting from the organic structure of the soil. It is also the case of an anion with active dynamics, especially since it is not part of any firm processes of anion absorption, which offers a bigger bioavailability both on the plowed surface level and the depth of the soil profile.

### **MATERIALS AND METHODS**

The researches have been conducted on soil cultivated with tomatoes (crop on the field) in Oradea in 2003.

The form of the nitrates on the depth of the soil profile was examined. The soil was phaeoziom clay, to which we did maintenance and fertilization works according to the technology of the crop.

The nitrates (N-NO<sub>3</sub>) were measured colorimetrically in the soil with phenoldisulphonic acid after a previous digging with 0.1 n K<sub>2</sub>SO<sub>4</sub>.

### **RESULTS AND DISCUSSIONS**

The dynamics of the profile of nitrates (N-NO<sub>3</sub>) shows that during the autumn-winter season, previously to the technology and common to the autumn's use of fertilizers, the highest level of this nourishing anion is maintained at the surface, usually at the depth of 0-10 cm and 0-20 cm

(figure 1, figure 2), and after plantation and the following phenol-phases (figure 3), the utmost level of the nitrates moves to the depth of the profile. This explains the possibility that at the end of the vegetation period (at the final fruit harvesting) this maximum of the nitrate concentrations may be found at the base of the soil profile, even outside the edaphic depth and volume explored by the roots of the tomatoes (figure.4)

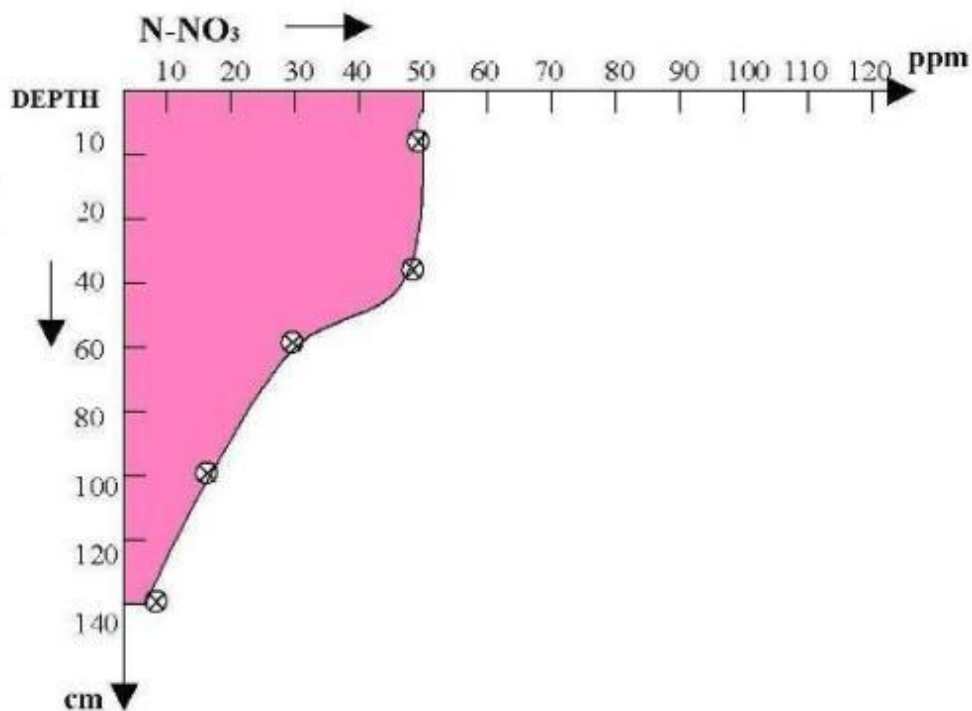


Fig. 1. Nitrate representation (N- NO<sub>3</sub>) in soil during autumn determinations (November).

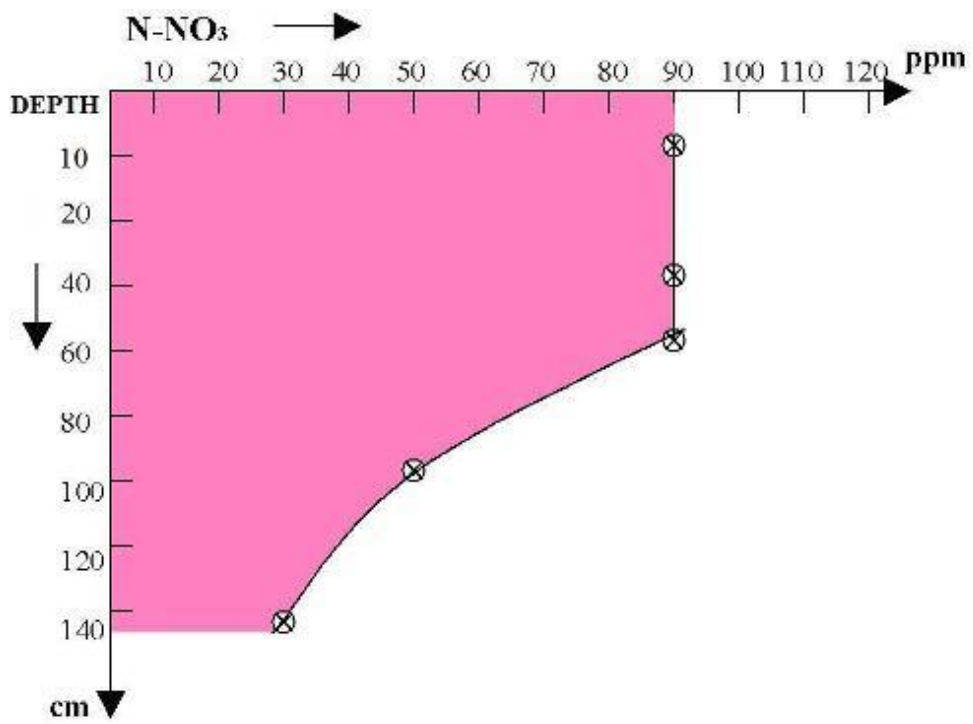


Fig. 2. Nitrate representation (N-NO<sub>3</sub>) in soil during winter determinations ( February).

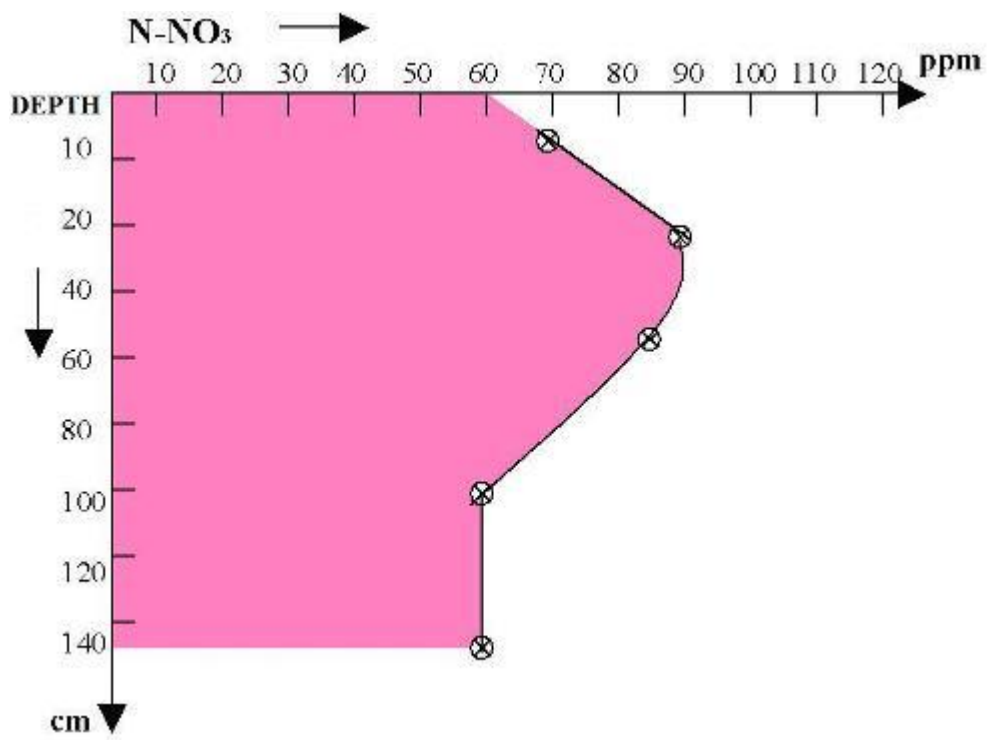


Fig. 3. Nitrate representation (N-NO<sub>3</sub>) in soil during spring determinations (April and May).

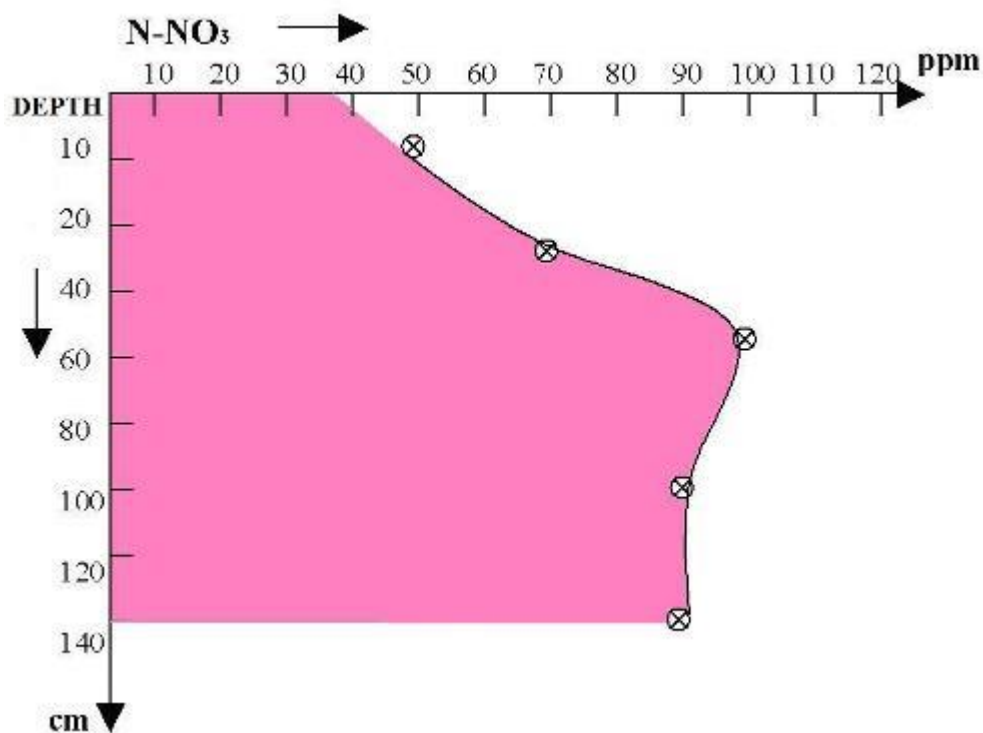


Fig. 4. Nitrate representation (N-NO<sub>3</sub>) in soil during last autumn determinations ( last harvests, September)

## CONCLUSIONS

This profile dynamic of the nitrates (N-NO<sub>3</sub>) in the tomato crop in the field, on the black earth of Oradea, indicates a decrease in the effective nitrogen contribution towards the end of the vegetation period and excludes its extension in time in favor of crop ripening and production. Through this movement of the “nitrates mirror” to the depth of the soil, it is certainly inferred a big potential of movement of this compound to the phreatic level of the soil and even a contamination of it if the crop is multiannual in the same conditions.

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