THE DYNAMIC OF THE NITRIC NITROGEN FROM A CHERNOZEM SOIL AT THE WHEAT CULTURE UNDER THE INFLUENCE OF THE FERTILIZATION WHIT NITROGEN AND DIFFERENT AGRICULTURAL WORK

DINAMICA AZOTULUI NITRIC DINTR-UN SOL CERNOZIOMIC LA CULTURA DE GRÂU, SUB INFLUENȚA FERTILIZĂRII CU AZOT ŞI DIFERITELOR LUCRĂRI ALE SOLULUI

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Abstract: *In the work it is presented the dynamics of the nitric nitrogen to the wheat culture from a chernozem soil, under the influence of different doses of nitrogen, on an invariably found of phosphorus and different working of the soil. It has been noticed the increase of the nitric content of the soil once the doses of the fertilizers have been increased too, depending on the vegetation stages of the culture during the gathering of samples for the analyse.*

Rezumat: *În lucrare se prezintă influența unor doze de azot pe fond constant de fosfor şi a lucrării diferite a solului asupra dinamicii azotului nitric dintr-un sol cernoziomic, la o cultură de grâu în condiții de neirigare.*

Key words: *nitrogen doses, wheat culture, fertilization, non-irrigation, agricultural work*
Cuvinte cheie: *doze de azot, cultura de grâu, fertilizare, lucrările solului*

INTRODUCTION

The main source of nitrogen for the nourishment of the plants is the nitric nitrogen this one being the most accessible and soluble form of nitrogen.

The dynamic of the nitric nitrogen from the soil is influenced by the conditions of the cultivation (fertilization, irrigation, agricultural work), by weather (temperature, humidity) and by the activity of the micro-organisms.

MATERIALS AND METHOD

The research work was carried out at SCDA Caracal and it had in view the dynamics of the N- NO_3^- on a chernozem soil at the wheat culture in conditions of non-irrigation, fertilization with N and different working of the soil.

The soil were the experiment was located is chernozem that has in the arable layer a moderate acid reaction. This soil can be considered as average supplied with nitrogen and the available phosphorus content is higher than the total nitrogen and is reduced on the soil profile from 44.9 to 20.9 ppm.

As regards the available potash, the SCDA Caracal chernozem is good supplied with this element, the first two horizons recording a variation between 224.5 a to 252.8 ppm.

The climatic condition differed as thermal regime and rainfall, less favourable being the 2003 year; the following year, approximatively normal and the 2005 year has recorded a usual thermal regime and higher rainfall.

The experimental device, having a term of 3 years (2002-2005), included the following factors:

- the „A" factor: the method of working the soil, having three degrees:
- a_1 - ploughing at 18-20 cm.+ harrowing
- a_2 - chisel at 18-20 cm.+ harrowing
- a_3 - chisel at 8-10 cm.+ harrowing
  The preparation of the seedbed was made by two disking and one combinator.
- The „B" factor: the fertilization with nitrogen on an invariably found of P_{80}, with four degrees: $b_1 - N_0$, $b_2 - N_{50}$, $b_3 - N_{100}$, $b_3 - N_{150}$.

The fertilizers with phosphorus were applied every autumn, before ploughing (as simple super phosphate with 20% P_2O_5 and the nitrogen as NH_4NO_3 with 33.5% N) in the established doses and the rest of the quantity in the early spring.

It was cultivated Lovrin 34 type with a density of a 550 b.g./ m^2, 12.5 cm. between lines, 5-6 cm. depth, the seeds treatment was made with Sumi 8 Plus, in a dose of 1.5 l/t.

RESULTS AND DISCUSSION

The dynamics of N- NO_3^- from the soil was examined during the last years of the experiment, at four data in the vegetation period (table 1, figure1):

- the 1st of November - before applying the doses of nitrogen
- the 8th of December – 30 days from the first application of the dose
- the 25th of April – 30 days after the second dose
- the 28th of July – the harvest of the wheat

Table 1

Values N-NO_3^- ppm at the wheat culture

Variant	Before applying the doses of nitrogen 1.11.2004	30 days from the first application of the dose 8.12.2004	30 days after the second dose 25.04.2005	The harvest of the wheat 28.07.2005
$a_1 b_1$	12.34	6.56	3.41	3.38
$a_1 b_2$	27.56	26.41	9.45	5.22
$a_1 b_3$	37.14	45.47	26.04	14.70
$a_1 b_4$	47.12	57.59	23.93	13.91
$a_2 b_1$	22.97	8.66	4.46	3.65
$a_2 b_2$	22.71	37.80	13.67	9.45
$a_2 b_3$	49.61	59.42	25.77	13.65
$a_2 b_4$	60.11	62.16	35.77	26.77
$a_3 b_1$	14.70	16.83	14.20	3.02
$a_3 b_2$	17.85	11.81	9.72	7.87
$a_3 b_3$	59.90	35.96	26.30	18.11
$a_3 b_4$	42.92	33.60	15.25	16.51

Depending on the basic work and the level of fertilization, the nitric nitrogen content from the soil varied in this way:

- The preparation of the soil with a common plough at 18-20 cm. caused reduced values of the nitric nitrogen in the soil from 3.38 to 12.34 ppm.

The application of the dose of N_{50} caused the increase of the content of N- NO_3^- from 5.22 to 27.56 ppm, for N_{100} from 14.70 to 45.47 ppm and forN_{150} from 13.81 to 47.12 ppm.

- the use of the chisel at 18-20 cm. caused the biggest content of the nitric nitrogen from the soil, with values between 3.65-22.97 ppmmeven in N_0 variants.

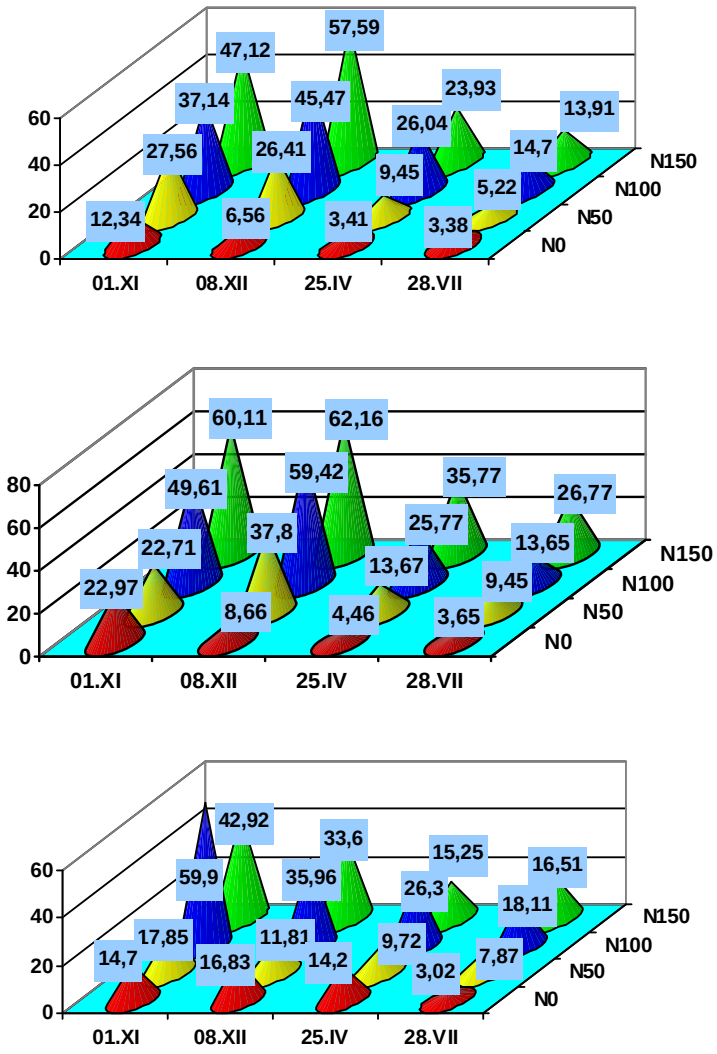

Figure 1. The dynamics of the N- NO_3^- on a chernozem soil at the wheat culture in conditions of non-irrigation, fertilization with N and different working of the soil at four data in the vegetation period

- 1 - ploughing at 18-20 cm.+ harrowing
- 2 - chisel at 18-20 cm.+ harrowing
- 3 - chisel at 8-10 cm.+ harrowing

Applying the nitrogen doses, the content of N-NO_3^- increased from 9.45 to 37.80 ppm for the dose N_{50}, for N_{100} the N-NO_3^- values were between 13.66 and 59.42 ppm and for N_{150} between 26.77 and 62.16 ppm.

- The preparation of the soil with the chisel at 8-10 cm. allowed the accumulation of important quantities of nitric nitrogen in the soil but less than in working the soil with the chisel at 8-10 cm.

The values of $N\text{-}NO_3^-$ registered on doses of fertilizers raised proportionally to their increase. Thus, for N_0 the content of $N\text{-}NO_3^-$ had values between 3.02 and 16.83 ppm, for N_{50} between 7.87 and 17.85 ppm, for N_{100} between 18.11 and 59.90 ppm and for N_{150} between 15.25 and 42.92 ppm.

CONCUSIONS

1. The use of the chisel at 18-20 cm. led to obtain the biggest content of nitrogen in the soil, even at the unfertilized variant.
2. The values of the content $N\text{-}NO_3^-$ registered on doses of fertilizers increased proportionally to their increase.
3. The minimum content of $N\text{-}NO_3^-$ from the soil was noticed as it was expected, at the harvesting of the wheat and the maximum of $N\text{-}NO_3^-$ after 30 days since application of the 1^{st} dose of nitrogen – 8^{th} December.
4. The values relatively reduced of the content of $N\text{-}NO_3^-$ which were registered at the third time of determination(25.04) are explained by the maximum consumption of N by the plants in that period of time, that corresponds to the pre-flower phase.
5. The least content of $N\text{-}NO_3^-$ depending on the vegetation stage of the culture was noticed at harvesting, and in comparison with fertilization at the variants without nitrogen.

LITERATURE

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