STUDIES CONCERNING THE IMPACT OF FERTILISATION ON PROTEIN AND OIL CONTENT IN A SOY CULTIVAR ASSORTMENT

STUDII PRIVIND INFLUENȚA FERTILIZĂRII ASUPRA CONȚINUTULUI DE PROTEINĂ ŞI ULEI LA UN SORTIMENT DE SOIURI DE SOIA

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Abstract: *In this paper we present the results of research on protein and oil content in the soy cultivars Românesc, Columna, Avila, SP9191RR, S2254RR, and AG0801RR with differentiated nitrogen fertilisation (N_0, N_{50}, N_{100}), on a constant fund of $P_{60}K_{60}$. At the level of the studied factors, on the average during the trial cycle 2004-2006, in Variaş, protein content varied in the studied biological materials between 27.5% and 39.9%, while oil content was between 21.6% and 25.1%.*

Rezumat:*În lucrare sunt prezentate rezultate privind evoluția conținutului de proteină şi ulei la soiurile Românesc, Columna, Avila, SP9191RR, S2254RR şi AG0801RR, cumulate în condiții de fertilizare diferențiată cu azot (N_0, N_{50}, N_{100}), pe fond constant de $P_{60}K_{60}$.*

La nivelul factorilor studiați, în medie pe ciclul experimental 2004-2006, în zona Variaş, conținutul de proteină a variat la materialele biologice studiate între 27,5% şi 39,9%, iar conținutul de ulei între 21,6% şi 25,1%.

Key words: *soy, fertilisation, protein and oil content*

Cuvinte cheie**:** *soia, fertilizare, conținut de proteină şi ulei*

INTRODUCTION

Soy is among the most crops in the Romanian Western Plain, due to the favourable soil and climate conditions in the area.

World area cultivated with soy is over 91,000 thousands of ha.

In Romania, after 1990, the areas cultivated with this important crop diminished, but at present there is an increasing trend resulting in 190 thousands of ha cultivated in 2006.

MATERIAL AND METHOD

Research was carried out in the plain area of the Banat, on the first terrace of the Mureş River, on a typical chernozem.

The soy cultivars we studied were as follows: Românesc, Columna, Avila, SP9191RR, S2254RR, and AG0801RR.

We monitored the impact of variable nitrogen doses (N_0, N_{50}, N_{100}) on a fund of $P_{60}K_{60}$. Wheat was the pre-emergent crop.

RESULTS AND DISCUSSION

Result synthesis concerning the evolution of protein content depending on the soil and fertilisation is presented in Figure 1.

In the studied field, i.e. six soy cultivars cultivated on three agri-funds ($N_0P_{60}K_{60}$, $N_{500}K_{60}$, and $N_{100}K_{60}$), protein content as, on the average for the period 2004-2006, between 27.5% in the AG0801RR cultivar on the nitrogen free agri-fund and 39.9% in the S2254RR cultivar in the variant fertilised with N_{100}.

In all the studied cultivars, protein content increased with the nitrogen dose, as follows: Românesc – 29.6% (N_0) – 37.8% (N_{100}); Columna – 29.4% (N_0) – 38.1% (N_{100}); Avila

– 31.4% (N_0) – 38.3% (N_{100}); SP9191RR – 29.3% (N_0) – 39.0% (N_{100}); S2254RR – 32.6% (N_0) – 39.9% (N_{100}), and AG0801RR – 27.5% (N_0) – 38.6% (N_{100}).

On the average for the three agri-funds, protein content was 33.5% in the Ag0801RR cultivar, between 34.2% and 34.6% in the Românesc, Columna, Avila, and SP9191RR cultivars, and 36.5% in the S2254RR cultivar.

Depending on cultivar, protein content was 29.9% on the nitrogen free agri-fund (N_0), 35.2% on the N_{50} fund, and 38.6% on the N_{100} agri-fund.

As a conclusion, nitrogen fertilisation on the agri-fund $P_{60}K_{60}$ contributed to the increase of protein content with about 5% for N_{50} and with about 8% for N_{100}.

Synthesis results during the trial cycle 2004-2006 concerning oil content are presented in Figure 2.

Mean results on the three agri-funds point out that in the studied cultivars oil content was rather close, as follows: Românesc – 22.6%, Columna – 23.0%, AG0801RR, and S2254RR with 23.2%, SP9191RR – 23.3%, and Avila – 23.7%. Therefore, the six cultivars ranged within close limits (22.6%-23.7%), with difference up to 1% between them.

Nitrogen fertilisers had a negative impact on oil content: thus, in the studied field, it diminished from 24.2% in the N_0 variant, to 22.9% in the variant fertilised with N_{50} and 22.3% in the variant fertilised with N_{100}.

Cumulating protein and oil contents in the studied field, we can see that the six soy cultivars range within 56.7% (AG0801RR) and 59.7% (S2254RR) (table 1).

Table 1

Protein content and oil determinated experimental cycle 2004-2006

	Soiul						**Doza de azot pe fond de $P_{60}K_{60}$**		
	Românesc	**Columna**	**Avila**	**SP9191RR**	**S2254RR**	**AG0801RR**	**N_0**	**N_{50}**	**N_{100}**
Proteina	**34,4**	**34,2**	**34,6**	**34,3**	**36,5**	**33,5**	**29,9**	**35,2**	**38,6**
Uleiul	**22,6**	**23,0**	**23,7**	**23,3**	**23,2**	**23,2**	**24,2**	**22,9**	**22,3**
TOTAL	57,0	57,2	58,3	57,6	59,7	56,7	54,1	58,1	60,9

As for the impact of nitrogen fertilisation on the constant fund $P_{60}K_{60}$, we can see that protein and oil contents increased from 54.1% (N_0) to 58.1% (N_{50}) and to 60.9% in the variant fertilised with N_{100}, together with the nitrogen dose, in the trial field ($N_0 – N_{100}$),

CONCLUSIONS

Soy is the most important protein and oil crop for the studied area.

Protein content was favourably determined by nitrogen fertilisers, increasing, on the average for the six soy cultivars, from 29.9% (N_0) to 35.2% (N_{50}) and 38.6% (N_{100}).

Oil content was negatively determined by the nitrogen fertilisers applied, diminishing from 24.2% in the N_0 variant, to 22.9% in the variant fertilised with N_{50} and to 22.3%, in the variant fertilised with N_{100}.

Cumulating protein and oil contents we can see that they increased, in the studied field, from 54.1% (N_0) to 60.9% in the variant fertilise with N_{100}.

LITERATURE

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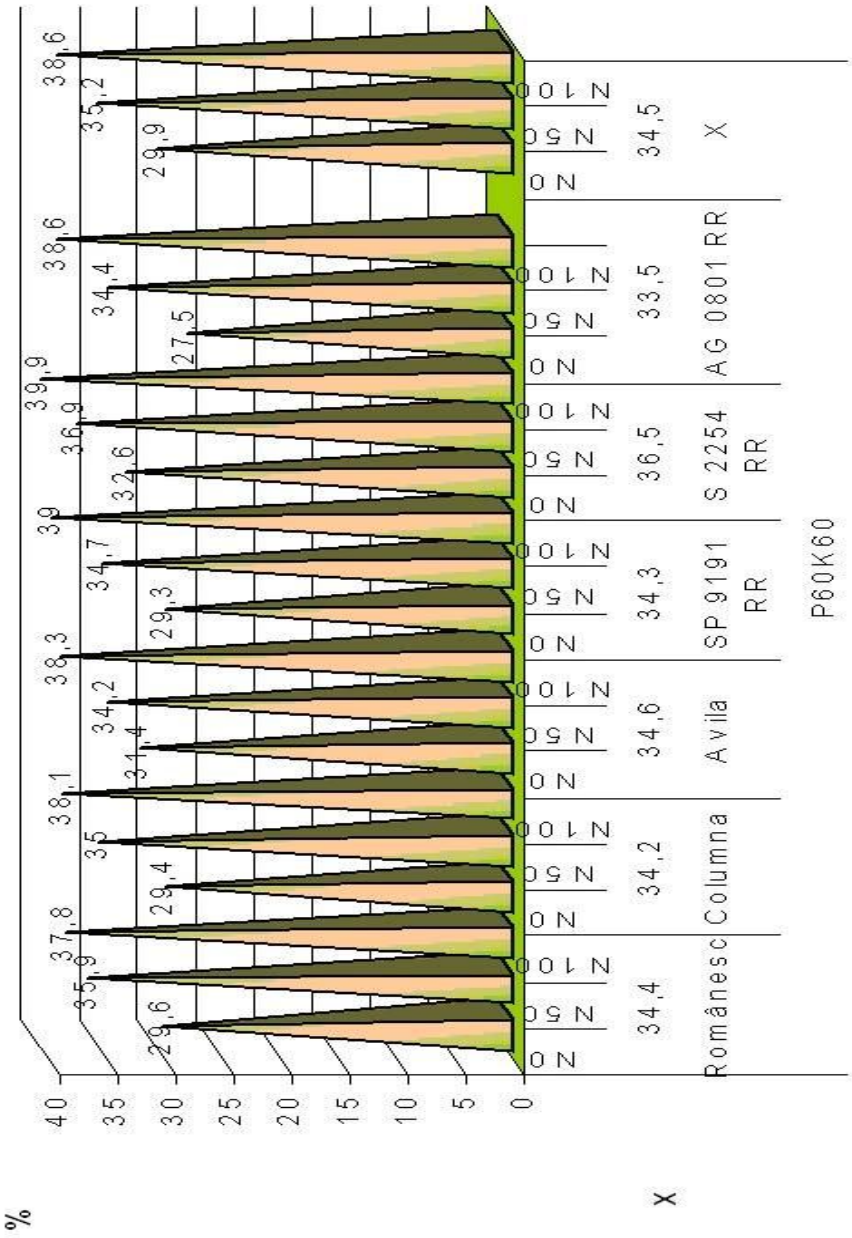

Figure 1.Sinthesis sof content protein variation depending of the variety and nitrogen doses in experimental cycle 2004-2006

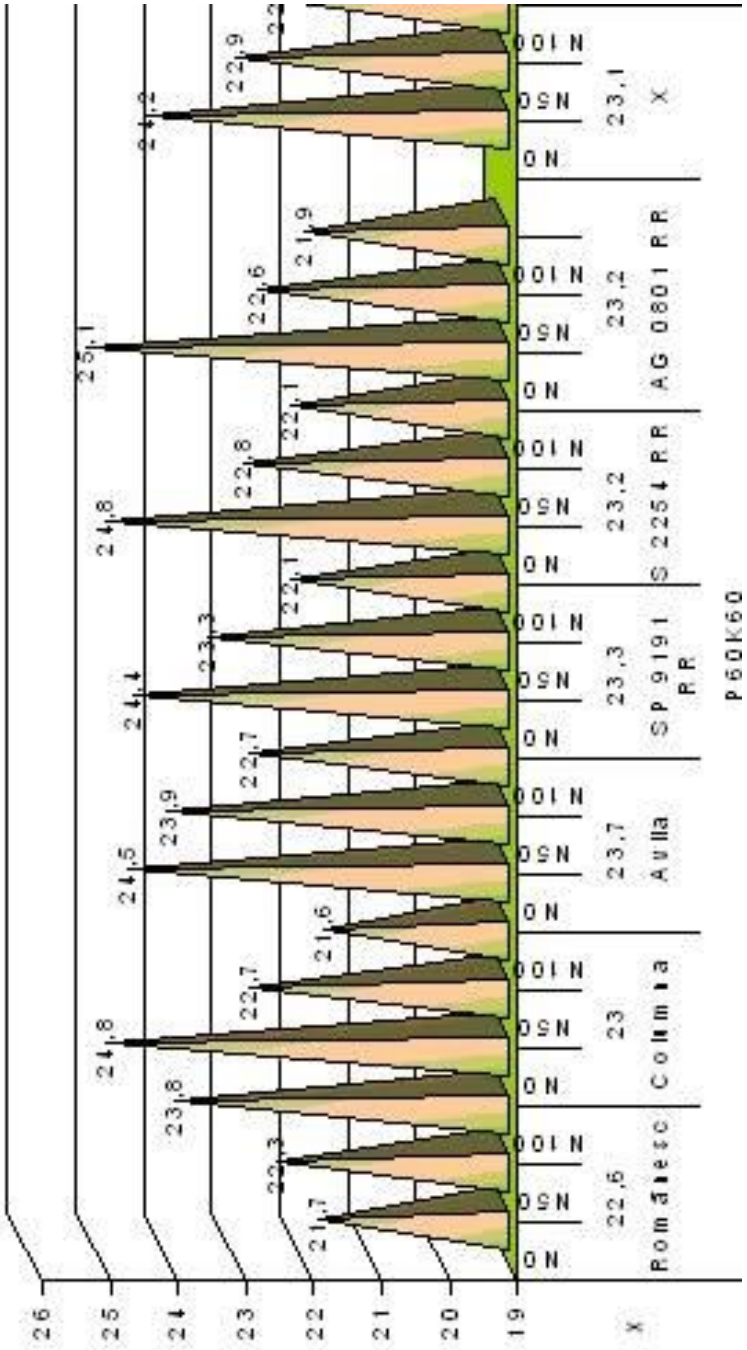

Figure 2. Sinthesis of the protein content depending of variety and nitrogen doses in experimental cycle 2004-2006