RESEARCH ON THE BEHAVIOUR OF WINTER OATS IN SOUTHERN BANAT

CERCETĂRI PRIVIND COMPORTAREA OVĂZULUI DE TOAMNĂ ÎN SUDUL BANATULUI

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Abstract. *Winter oats has a special importance in the areas in which winters are soft since the yielding capacity of winter cultivars is superior to that of spring cultivars. In the studied domain, depending on the cultivar and fertilisation level, crops varied between extreme limits – 3268 kg/ha and 3943 kg/ha. To mention that during the trial cycle 2005-2007, there were climate abatements compared to multi-annual means of the area. Crop response curves pointed out in the studied cultivars maximum yields between 3581 kg/ha in the Florina cultivar, 3914 kg/ha in the Mirabel cultivar, and 3928 kg/ha in the Nupţiale cultivar for the nitrogen doses in the studied domain. Mean protein content increased together with the dose of nitrogen as follows: between 12.9 (N_0) and 14.2 (N_{150}) in the Florina cultivar, 12.5 (N_0) and 13.8 (N_{150}) in the Mirabel cultivar and 12.7 (N_0) and 14.0 (N_{150}) in the Nupţiale cultivar.*

Rezumat: *Ovăzul de toamnă prezintă importanță deosebită în zonele în care iernile sunt blânde, deoarece capacitatea de producţie a soiurilor de toamnă este superioară faţă de soiurile de primăvară. În domeniul cercetat, în funcţie de soi şi nivelul de fertilizare, recoltele au variat între limitele extreme - 3268 kg/ha şi 3943 kg/ha. De menţionat că, în ciclul experimental 2005-2007, s-au înregistrat importante abateri climatice faţă de mediile multianuale ale zonei. Curbele de răspuns ale recoltei au evidenţiat, la soiurile luate în studiu, realizarea producţiei maxime cuprinse între 3581 kg/ha la soiul Florina, 3914 kg/ha la soiul Mirabel şi 3928 kg/ha la soiul Nupţiale la dozele de azot din domeniul cercetat. Conţinutul mediu de proteină a crescut o dată cu doza de azot între 12,9(N_0)-14,2 (N_{150}) la soiul Florina, 12,5 (N_0)-13,8(N_{150}) la soiul Mirabel şi 12,7(N_0)-14,0(N_{150}) la soiul Nupţiale.*

Key words*: winter oats, cultivars, fertilisation*
Cuvinte cheie: *ovăz de toamnă, soiuri, fertilizare.*

INTRODUCTION

Soil and climate conditions in southern Banat allow the introduction and expansion into cultivation of winter oat cultivars since in this area climate is temperate continental, of the Banat sub-type, with Mediterranean and ocean slight differences.

Annual precipitations have a mean value of 680 mm.

In this context, winter oat cultivars can maintain their production potential which can increase up to 8 t/ha.

MATERIALS AND METHOD

Research was carried out in southern Banat, at Oravita, on a brown, luvic, vertic, moderately pseudo-gleyed, with low acid reaction (pH 5.21), low humus content (2.40%), low phosphorus content (15 ppm), and medium potassium content (157 ppm).

Soil texture is clayish-loamy in the surface horizon, and loamy-clayish deep down.

The trial was bi-factorial; factor A was represented by the cultivar cultivated with three graduations, and factor B was the fertilisation level with four graduations of the nitrogen dose applied on a constant fund of $P_{60}K_{60}$.

The cultivars under study were Florina, developed at the S.C.D.A. Lovrin (Timis County) and two cultivars from France (Mirabel and Nupțiale).

The technology applied was the current one, using 550 g.g./m^2.

RESULTS AND DISCUSSION

Yield results during the trial cycle 2005-2007 are mentioned in Table 1.

We can see that the Mirabel and Nupțiale cultivars have overrun the yield of the Florina cultivar, on the average per studied fertilisation level, with 7%.

Table 1

Winter oat yield depending on fertilisation (2005-2007)

Factor A	Factorial B				A Factorial averages			
	N_0	N_{50}	N_{100}	N_{150}	Crop kg/ha	%	Difference kg/ha	Significance
Florina	3268	3450	3595	3554	3467	100		
Mirabel	3480	3744	3799	3897	3730	107	263	xxx
Nupțiale	3381	3740	3832	3943	3722	107	255	xxx

Dl 5% = 113 DL1% = 160 Dl 0,5% = 233

B Factorial average

Specification	N_0	N_{50}	N_{100}	N_{150}
Crpo kg/ha	3376	3645	3742	3798
%	100	108	111	112
Difference kg/ha		269	366	422
Significance		xxx	xxx	xxx

Dl 5% = 130 kg/ha DL1% = 185 kg/ha Dl 0,5% = 269 kg/ha

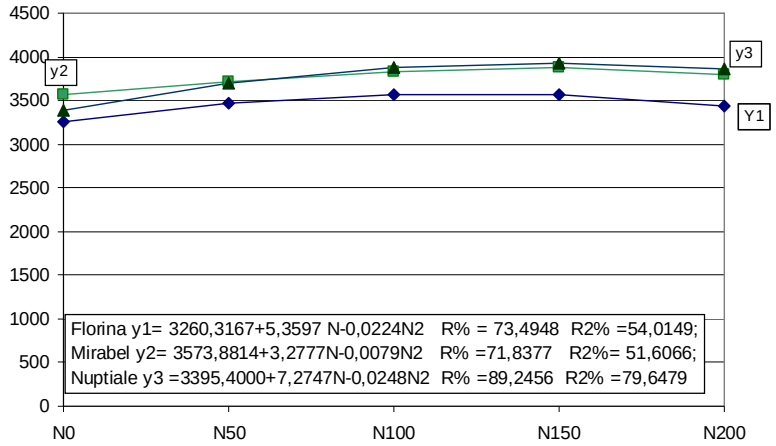

Figure 1. Response curves of the crop to nitrogen fertilisers applied on $P_{60}K_{60}$

Nitrogen fertilisers applied on a fund of $P_{60}K_{60}$ were well valorised. Thus, the yield increase due to the dose of N_{50} was 8% and it increased with the dose to 11% in the variant fertilise with N_{100} and to 12% in the variant fertilised with N_{50}.

Analysing both these results and the response curves of the yield presented in Figure 1, we can see there is no need to increase the Nitrogen dose over N_{100}.

Figure 2 shows the evolution of the mean protein content depending on cultivar and fertilisation. We can see that in all the three cultivars, in the studied domain, N_0-N_{150}, protein content increased with the nitrogen dose from 12.9% (N_0) to 14.2% (N_{150}) in the Florina cultivar, between 12.5% (N_0) and 13,8% (N_{150}) in the Mirabel cultivar, and between 12.7% (N_0) and 14% (N_{150}) in the Nupțiale cultivar.

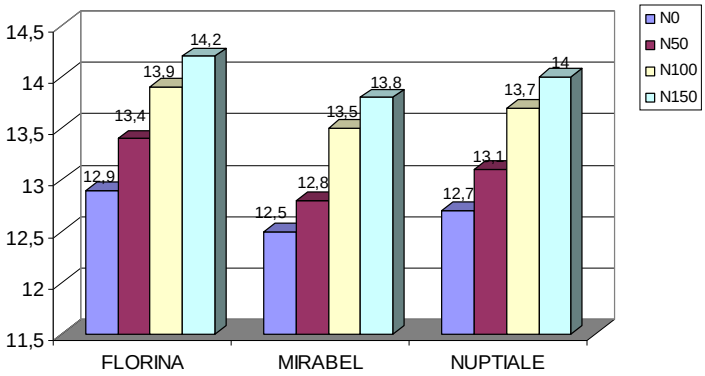

Figure 2. Mean protein content depending on cultivar and fertilisation (2005-2007)

On the ground of the yield and protein content we determined protein yield as presented in Figure 3.

Results point out that in the three cultivars, protein yield was close (471 kg/ha in the Florina cultivar) and (4095 kg/ha in the Nupțiale cultivar).

Depending on the nitrogen dose, protein yield increased from 389 kg/ha in the variant N_0 to 532 kg/ha in the variant N_{150}.

Winter oat cultivars tested with proper sowing needed no vegetation treatment. The only disease was *Puccinia coronata*, but below the damage threshold.

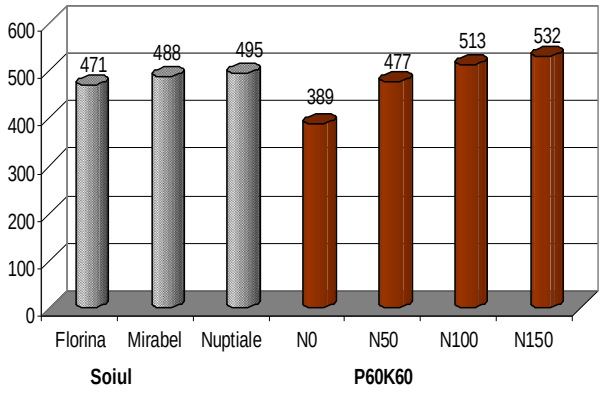

Figure 3. Protein yield depending on cultivar and fertilisation

CONCLUSIONS

1. The winter oat cultivars Florina, Mirabel, and Nupțiale can be successfully cultivated in southern Banat, where they have yielded up to 4000 kg/ha during a trial cycle that was less favourable to this crop.
2. Protein content was favourably influenced by nitrogen fertilisers and oscillated between 12.5% (the Mirabel cultivar, N_0) and 14.2% (the Florina cultivar, N_{150}).
3. Protein yield varied between 389 kg/ha and 532 kg/ha.

LITERATURE

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