RESEARCHES REGARDING THE RAPESEED CROP FROM THE AREA OF TĂŞNAD, SATU-MARE

Oliviu D. BUZGĂU, Constantin BELE, Maria V. MORAR, Cristian T. MATEA, Alexandru SALONTAI

University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca
Calea Mănăştur 3-5, 400372, Cluj, Romania
Corresponding author: mvmorar@yahoo.de

Abstract: *The interest of the rape, known and cultivated since ancient times, has increased greatly in recent decades due to its importance as a source of raw materials for industry, nutrition and for its potential as a renewable energy source. The beneficial effects of this culture for soil restoration and conservation are well known. The purpose of the experiences made during the years 2005-2006 was to study some varieties of rapeseed in order to introduce the winter rapeseed culture as an alternative to the summer rapeseed under the environmental conditions of the north-west plain of Transylvania. The experiences in the field and in the laboratory studied the influence of the plant sown density rows for different dosages of the fertilizers, as well as the production and quality of the rapeseed. The studied material consists of two varieties rapeseed: Heros (created by the company UNION SAAT) and Olindigo. The experimental technique in the field was of poly-factorial order with the following factors: variety (Heros and Olindigo), sowing density (75, 100 and 125 g.k./sq.m.), dosage of chemical fertilizers (three dosages for estimated production of 2,3 and 4 t/ha), resulting in 18 variants experimental work plus the control. In the laboratory were determined the elements of productivity (number of plants per sq.m., number of branches per plant, number of siliques, number of seeds in silique), the thousand seeds weight according to the Romanian standard SR 6123/99, the hectoliter weight according to the Romanian standard S.R. 6124/99, the seed oil content, the oil production and the physical production (harvesting with combine). The obtained results were statistically evaluated by the analysis of variance and Duncan test. The climatic conditions were monitored continuously. Results showed that the genetic and the technological factors influenced the productivity of the rapeseed crop and its quality (oil content and therefore the yield per hectare). For the two tested varieties there resulted no significant differences under the production conditions of the climate of the years 2005 and 2006 taking into account the interaction between the sowing density and fertilization level. The results of the determination of productivity factors were better for a smaller sowing density (75 g.k./sq.m.) (also, lower costs). The values resulted for the hectoliter weights are not significantly different for the two experimented varieties, where the density can be found in a positive correlation with them. In the case of higher sowing density the values are in negative correlation with the thousand seeds weight. However, the fertilization in higher doses did not stimulate the yield, probably due to lower biological potential of winter rape.*

Key words**:** *rapeseed, crop, Transylvania*

INTRODUCTION

The rape (*Brassica rappa*, F. crucifere) is the most important oleaginous plant, its culture being on the third place between the oil productions cultures in the word. On the European continent the rape represent the principal oleaginous plant, cultivated on wide areas, replacing the sunflower culture, because of its thermo barriers (SALONTAI, 1982).

The big rape big (Colza) was grown in ancient times in the Mediterranean basin and Near East and the smaller rape type (Naveta) was cultivated in the XVI-century in Belgium and Netherlands (SALONTAI, 1982).

The oil extracted from the rapeseed was used for lighting purposes. In human alimentation the rapeseed was used only starting with last century (SALONTAI, 1976). The

rapeseed culture was introduced in our country about 1840-1850, brought from England, spreading in Moldavia (big rape: Colza, known as Belgian) and in Wallachia the small rape.

The rapeseed contains a high proportion of oil, with multiple uses in the industry, and alimentation (BALTEANU, 1988). The products resulted at the processing are used as a valuable feed component ingredient in mixture ratio (rape cake) or as combustible material (the dried stalks). In rotation, the rape is an important plant, because it leaves the soil in a good physical chemical state, free of weeds, which are suppressed by the growing rhythm and the rich vegetative mass. On the other side, the rape set early the land free, being a good forerunner for the autumn wheat. After rape harvested at the beginning of June, there can be obtained a successive culture of maize, green mass, ensilaged or even corn (PINTILIE, 1974).

The interest for the rape culture has increased considerable in the last decade because of its use in biodiesel production, which presents an alternative for the conventional fuels (BORCEAN, 2004). The global area cultivated with rape has increased compared to 1970 (8,5 millions ha) 1,4 times in 1980, 2,6 times in 2001 and 3,6 times. In Romania, the rape culture was realized on large areas in the second part of the XIXth century, increasing at the beginning of the XXth century (1913 the cultivated area was of 80 millions ha). The rapeseed culture oscillated strongly because of the two world wars, as well as because of the conjuncture of the edible and industrial oil (SALONTAI, 1976). The cultivated area decreased gradually, becoming non-existent in the statistics 1964, probably because of the areas cultivated with sunflower and soya bean (SALONTAI, 1976). Between the years 1970 and 1980 the oil rapeseed re-appears in culture, on diminished areas, starting to increase after 1995 to 81 thousands ha in 1995. Afterwards the cultivated areas were going back to 13 thousand ha in 2003, to increase gradually and sensible to 249.277 ha in the year 2007. Due to the high demand, the cultivated areas in the plane of North-Vest increased considerable. Therefore, in the year 2005 in the four counties of the plane, the total rape cultivated areas were of 865 ha (production efficiency of 1.630 kg/ha- average value), increasing at 15.404 ha in 2008 (production of 1.844 kg/ha). The cultivated area with rape in Satu Mare county increased 2005 almost 9 time and in Bihor about 12 times, whereas in Timis county the area increased more than 8,5 times. A spectacular increasing was registered in Arad County, where the cultivated area increased 26 times.

The occurrence of new sorts of rape, with a law erucic acid content resulted in the necessity to study its cultivation and quality.

The purpose of the work was to study comparatively two varieties of spring rape: Heros and Olindingo, as an alternative of the autumn rape, considering the risk of its disparagements in the frosty winters without snow.

MATERIAL AND METHODS

Our researches regarding the rapeseed culture were made in the neighborhood of Tăşnad village, county of Satu Mare, situated in the plane of Nord-Vest of Transylvania, in the years 2005 – 2006. There were established the general climatic condition of the Tăşnad area as well as the specific conditions of these years, referring to the principal climatic factors: temperature, precipitations, light, wind, fog, dew, hail. There were studied: the soil condition (morphology, physical properties, the depth of the water layer).

Two varieties of spring rape Colza: Heros şi Olindigo, were studied.

The variety Heros, created by SAATEN UNION, a semi-early one, has a vegetation period of 90- 95 days. The plants average height is of cca. 90 cm, with leaves with the median lobes developed. The variety is resistant against diseases, dropping and shaking and has an average oil content of 38,8 - 41 %, erucic acid content lower than 0,1 %. The seeds have average size and the weight of thousand seed of 3,3-4 g. Under optimal condition the production potential of the Heros variety is about 1700-2000 kg/ha.

The variety Olindigo is also a semi-early one, with a vegetation periods of 95-100 days. The plants have an average height of 98 cm, good resistance against diseases, dropping and shaking and the production potential of the Heros variety 1750-2100 kg/ha. The oil content of the rapeseed is of 38-40 %, and of the erucic acid is below 0,1 %. The rapeseed had the thousand seed weight of de 3,4-4 g.

Both varieties are recommended for cultivation in all favorable areas of Romania.

To accomplish the aimed goals, it was applied a poly-factorial into the field.

The experiment had following factors and graduation:

A. the varieties with the graduations: a1 HEROS and a2 OLINDIGO;

B. sowing density, with the graduations: b1: 75 g.k./sq.m., b2: 100 g.k./sq.m. and b3: 125 g.k./sq.m.;

C. optimal economic chemical doses to obtain the productions of: c1 2000 kg/ha, c2 3000 kg/ha şi c3 4000 kg/ha;

The experience type: 2 x 3 x 3 = 18 variants **+ x** (control);

Variants: V1= a1 b1 c1, V2=a1 b1 c2, V3=a1 b1 c3, V4=a1 b2 c1, V5=a1 b2 c2, V6=a1 b2 c3, V7=a1 b3 c1, V8=a1 b3 c2, V9=a1 b3 c3, V10=a2 b1 c1, V11=a2 b1 c2, V12=a2 b1 c3, V13=a2 b2 c1, V14=a2 b2 c2, V15=a2 b2 c3, V16=a2 b3 c1, V17=a2 b3 c2, V18=a2 b3 c3.

The applying method was randomized in three blocks.

In the laboratory were determined: the productivity elements (number of plants per sq.m., number of branches on plants, number of silique on branches and plants, number of seed per silique and one thousand seed weight (according to SR 6123/99), the hectoliter weight (HW), according to S.R. 6124/99, the physical production, the determination of the oil content in seed, the oil production (the fatty material from the seed was extracted with chloroform from the grinded sample, for 1,5 h and continuous homogenizing, filtration and rerunning of the extraction followed by the desiccation of the samples), the statistical evaluation of the data by variants analyzing and Duncan Test.

The evaluation of the considered factors was made based on the physical seeds production, of the total oil content, as well as of the oil production of a hectare. The efficiency calculation was made upon the obtained results. On the base of the production expenses and the capitalization, the economic efficiency of the experimental variants for the both rapes forms was calculated.

RESULTS AND DISCUSSIONS

The area of Tăşnad has an annual isotherm of 8,6 and 9,7. The average temperature of the years 2005 and 2006 were of 9,8 C° and 10,1 C°. These were considerable over the multi-annual average, characterizing both of the years as being warm. The amount of the average multiannual temperatures were over 0 C° (around 3.966 C°), the first frosting day being registered between 20-30 of September, and the last frosty days between 21st and 30th of April. The annual thermo regime, was of 290- 300 days without frost, ensuring favorable conditions for the most of the agricultural culture, including the rape.

The annual quantity of precipitation registered in the both years differed very much from the multi-annual average. In the year 2005 the amount of precipitation of 768,2 mm was considerable higher than the multi-annual average, while in the year 2006 this was significantly lower. The rape culture was not affected, due to the precipitation repartition during the vegetation period, which was favorable for the culture, the seeds having enough humidity for germination. In the growing period the plants had favorable conditions for growing and developing. The total number of days with precipitations was of 120-130, from which about 20 under the form of snow (17%).

In the year of experience the length of sun shining in the vegetation period (966 and 963 h) was higher compared with the multi-annual value (876 h), being favorable for the plant development, especially of the flowering, pollination and fats accumulation.

In the area of Tăşnad the strong winds or wind accompanied by rain, unfavorable for the rapeseed culture, are very seldom. In the experimental years no phenomena, as persistent fog or hail fallings, seldom in the area of Tăşnad, were registered..

The climatic conditions, the vegetations, the relief, the parental materials, the human action upon the barks epidermis during the agricultural process works, were contributing, in complex, to formation of the actual soil layers (BUNESCU, 1988).

The territory was situated in a pedographic areal with percolative hydric regime, so that the dominant processes are consisting of the migration on profile of the material from the surface in the deeper layers. The depth of the water layer was at maximum of 2-3 m, which is providing the soil with humidity excess, occurring puddles at the soil surface with multiple negative effects. In the years with precipitations the level of the water layer decreases and therefore the productions are bigger and surer.

The most important physical characteristic of this type of soil are: the apparent density between 1,43-1,62 g/cm, the water permeability with median value (3,1 mm/h), which explains the pluvial water stagnation at the soil surfaces in the years with precipitation excess, the useful edafic volume is excessively high, over 150 %, the total porosity is very low (41-44%) in the layer 20-75 cm, the clay content (< 0,002 mm) is between 25,11-43,77%, the dust content was between 25,40 - 31,60 %, the content of very fine sand was between 28,77-40,86 % and the soil texture, on profile was as follow: clay, clay loam, clay loam, clay loam.

The most representative chemical characteristic of those soil type are: the small humus supply of 2,26 %, the deposit at 50 cm depth being average, 133 t/ ha, with the medium total nitrogen content in this horizon of 0,125 %, the mobile phosphor content of of 31,5 ppm, reduced mobile potassium supply in the first 20 cm with only 77 ppm, bases saturation degree of 82,01 % and neutral, pH = 7,20 soil reaction at the surface horizon. From the analyzing of the soils by the basal pedo-genetic criteria resulted that the soil on which the experience was placed had favorable characteristics for the rapeseed culture, presenting a light deficiency of assimilable phosphor and a strong deficiency in potassium. By evaluating the experimental data of the research regarding the average plant number on sq.m., resulted that the obtained values for the number of plant/sq.m. did not present evident differences, the values being practically equal (for the variety Heros: 103,10 plants/sq.m., for Olindingo: 102,17 plants/sq.m. and for the control: 102,6 plants/sq.m.) for the two genotypes in interaction with the sowing density and fertilizing level at the spring rapeseed COLZA (2006). At the Heros rapessed, the sowing density increase influences significantly the number of the plants increasing on sq.m. So, compared to the sowing desity of 75 g.k./sq.m. (control), the plants number increases significantly for 100 g.k.s/sq.m. and 125 g.k.s/sq.m., confirmed also by the Duncan test. Same development was observed for the genotype Olindingo, which proved the accuracy and precision of the sowing, under the condition of using of a very good prepared germinative bed, according to the request for the small rapeseed. Compared to the control variant V1-75 g.k./sq.m. (77,33 plants/sq.m.), the number of the plants from the variants higher in sowing densities (V2 andV3) were corresponding higher (100 g.k./sq.m.: 104,33 plants/sq.m. and for 125 g.k./sq.m.:124,87 plants/mp), the differences being significantly as, also, confirmed by the Duncan test. For the Heros genotype, was observed that by increasing of the fertilizing doses for the estimated production of 2 t/ha the number of plant/sq.m. (104,23) slowly decreased at the optimal economic doses of 3 t/ha with 101,67 plant/sq.m and slowly decreases for the doses of 4 t/ha (103,47 plants/sq.m.). For the Olindigo variety, resulted that the fertilization in different graduations did not influenced significantly the density of the plants on the unity area

(100,57, 102,80 and 103,20 plants/sq.m), due to the dependence of the technological level of the germinative bed and eventually because of some non-favorable natural factors.

At the analyses of the experimental data regarding the factor interaction upon the branches on plants resulted that these values are equally for the two rapeseed genotype. For the variety Heros, the increasing of the sowing density from 75 g.k./sq.m. (6,70 branches/plant), leads to decreasing of the branches number per plant (6,07 branches/plant for and 5,47 branches/plant for 125 g.k./sq.m.:). For the Olindigo genotype, by the sowing density increasing, decreased significantly the number of branches per plant: 6,50 branches/plant for 75 g.k./sq.m., 6,07 branches/plant for 100 g.k./sq.m, and 5,17 branches/plant for 125 g.k./sq.m., confirmed by the Duncan test.

For the spring rapeseed, the variety Heros, the fertilization at the level of the economic optimal dosage (EOD) for estimated production of 2, 3 and 4 t/ha under the conditions of the year 2006, did not influenced significantly the number of the branches per plant (6,20, 6,13 and 5,90 branches per plant), confirmed also by the statistic calculation. For the genotype Olindigo, there were not observed an positive influence of the higher dosages of chemical fertilizers upon the number of branches on plants (5,83, 6,00 şi 5,90 corresponding to 2, 3 şi 4 t/ha). For the economic optimal dosages higher than 2 t/ha, the differences are small, insignificant, outlined by the variance analysis as well as by the Duncan test. The results regarding the interaction of the considered factors upon the number of silique there were emphasized for the Heros genotype, that the silique number on the plant (117,63 silique/plant) were significantly lower than of the Olindigo genotype with 119,80 silique/plant, while for the last one the differences was considerable positive compared to the average values of the two types (118,7 silique/plant). With the increasing of the germinable kernels on the square meter decreases the number of silique on the plant, at a sowing density of 100 g.k./ sq.m. (116,43 silique/plant). The decrease is distinguished to the control (75 g.k./sq.m.: 134,47 siliques/plant) while at the density of 125 g.k./sq.m. (105,33 silques/plant) the difference is considerable. By increasing of the sowing density in Olindigo, the number of the silique on the plants decreases from 75 g.k./sq.m. (135,30 siliques/plant) connotatively to 100 g.k./sq.m. (116,77silique/plant) and considerable to 125 g.k./sq.m. (107,17 siliques/plant). Therefore, the number of silques on the plant is in an inverse relation to the sowing density. Likewise, was to be observed at the rapeseed Heros, where no favorable reaction resulted by increasing of the fertilization dosage estimated for a production of 2 t/ha (117,77 siliques/plant). The differences of 3,63-4,33 more silques on plant in the cases of increased doses are not notable (confirmed by the Duncan test).

The data regarding the influences of the studied factors upon the number of silques showed that under the conditions of the year 2006 that this is equally, the differences between the genotypes being insignificant (Heros: 28,10 seed/silque and for Olindigo: 28,07 seeds/silique). The differences between the minimal doses are not significant. At the Heros genotype resulted that with the increasing of the germinable kernels on the sq.m. (75, 100, 125 g.k./sq.m.), the number of seeds in silique decreased notable from 30,03 to 28,50 and considerable to 25,73, confirmed by the Duncan test. For the Olindigo type the evolution was similarly (i.e. 30,60, to la 28,40 and 25,47 siliques per silique). There is also a negative correlation between the sowing density and number of seed in silques. At the Heros type, the fertilizer influences the number seed in siliques such as upon the number of seed on the plant (dynamic in the mirror), the differences to the control being non-significantly (27,87, 28,60 and 27,80 seed per silique at 2, 3 şi 4 t/ha). For the Olindigo rapeseed, the number of seed per silique related to the fertilizing dosage at the estimated production of 2 t/ha (27,60 seeds/silique) increased slowly; the increase was insignificantly for 3t/ha (28,10 seed/silique), and distinctly for 4t/ha (28,83seed/silique).

The results of the studies regarding the influence of the factors upon one thousand seed weight showed that the values were considerable higher for the Olindingo genotype Olindigo (2,96g) and distinguished lower for Heros (3,02 g). Related to the sowing density of the Heros type the one thousand weight value (3,04g for 75 g.k./sq.m.) decreased gradually at 3,02g (100 g.k./sq.m.) and sensible to 2,56 (200 g.k./sq.m.), the differences being not significantly. For the Olindigo, as the sowing density increases, decreases considerable the one thousands weight values. At the Olindigo genotype for all the fertilizing dosages there were obtained distinguished significantly increases.

The results regarding the influence of the considered factors upon the hectoliter weight showed that for the two genotypes there exist a clear difference in the favor of the Heros type to the control and non-significative difference between the two types (Heros: 67,27 kg/hl and Olindigo: 66,23 kg/hl). For both of the types the increasing of the sowing density influenced the hectoliter weight which increased considerable. For the Heros type the hectoliter weight increased evidently, only to the calculated dosage of estimated production of 3 t/ha (66.70 kg /hl). In Olindigo type it increased for all dosage (2 t/ha: 66kg/ha, 3 t/ha 66,33 □i 4t/ha: 66,5kh/hl).

The data regarding the influence of the studied factors upon the physical production pointed out that the values of the hectoliter weight for the Heros rapeseed (2013,33 kg/ha) was superior to the Olindigo (1907,33 kg/ha), the difference of 86 kg/ha being insignificantly. Together with increasing of the sowing density for the rapeseed Heros, the production decreases, the statistical differences being evidently for the density of 100 g.k./sq.m., with 1927 kg/ha and distinguished significantly for 125 g.k./sq.m. (1703 kg/ha) compared to 2106,67 kg/ha (75 g.k./sq.m.). Same tendency resulted the rapeseed Olindingo: gradually decreasing of the production with sowing density increasing as 75 g.k./sq.m. (2179 kg/ha), distinctly significantly for 100 g.k./sq.m. (1878 kg/ha) and very significantly for 125 g.k./sq.m. (1725 kg/ha). For the use of increased dosages of chemical fertilizers, in interaction with the sowing density the production of Heros (considered year 2006) was limited at the optimal economic dosage for a harvest of 2 t/ha. The production differences for the other two dosage situation were not significant. Unlike to the sowing density factor, where by its increasing the observed influence was negative and considerable upon the seeds production, the fertilizing factor stimulated the harvest according to the fertilizing dosage increasing. With regard to the reference dosage for 2 t/ha, the harvest increased with 4,6 % (insignificantly) at the dose of 3 t/ha and with 7,9 % (considerable), at the dosage of 4 t/ha.

The oil contents of the seed and the oil production for one hectare are presented in the table 1.

The results shows that in the conditions of the year 2006 the oil contents had close values for the studied rapeseed types, a little bit higher for Olindigo (39,61 %) while for the Heros the oil content is lower influencing the oil production per hectare. In the rapeseed Heros the oil content decreases with the sowing density and it is in a negative correlation with the increasing of the fertilizing dosages. The highest values were obtained for a sowing density of 75 g.k./sq.m. and fertilizing level ensuring a production of 2 t/ha. For the Olindingo rapeseed there were observed clear delimitations between the fertilization graduations, increasing slowly to the maxim dosage.

In the table 1 it is revealed that the oil production per hectare of the two rapeseed type is practice equally. For the Heros genotype (728 kg/ha), was observed that the oil production per hectare decreases with the sowing density and fertilizer dosage increasing. Similar results were obtained for Olindigo type, too.

Table 1

The genotype influence in interactions with the sowing density and fertilizing level upon the oil content of the rapeseed and upon the oil production per hectare for the spring rapeseed Colza (a1 and a2)

Crt. nr.	Vari-ant	Oil content (by extraction)		Oil content of a1 and a2 (%)	OIL/HECTAR		Average production of the type a1 and a2 (%)	
		%	Relative %		kg	Relative rate	kg/ha	%
1.	$a_1b_1c_1$	39,79	102,42	38,08	809	110,82	728	99,71
2.	$a_1b_1c_2$	38,02	97.86		798	109,31		
3.	$a_1b_1c_3$	36,51	93,98		798	109,31		
4.	$a_1b_2c_1$	38,26	98,48		771	105,62		
5.	$a_1b_2c_2$	38,42	98,89		683	93,56		
6.	$a_1b_2c_3$	38,27	95,93		760	104,11		
7.	$a_1b_3c_1$	38,30	98,58		656	89,86		
8.	$a_1b_3c_2$	37,73	97,12		635	86,97		
9.	$a_1b_3c_3$	37,47	96,45		641	87,81		
10.	$a_2b_1c_1$	37,40	96,27	39,61	750	102,74	733	100,44
11.	$a_2b_1c_2$	39,12	100,69		830	113,70		
12.	$a_2b_1c_3$	40,11	103,24		881	120,68		
13.	$a_2b_2c_1$	40,46	104,14		680	93,15		
14.	$a_2b_2c_2$	38,23	98,40		655	89,73		
15.	$a_2b_2c_3$	40,90	105,28		785	107,53		
16.	$a_2b_3c_1$	40,55	104,37		645	88,36		
17.	$a_2b_3c_2$	40,60	104,50		677	92,74		
18.	$a_2b_3c_3$	39,10	100,64		696	95,34		
19.	X	Average= 38,85%	105,31	38,85	730	100,07	730	100,07

The data regarding the influence of the studied factor upon the economic efficiency of the spring rapeseed (2006) are presented in the table 2.

Table 2

Economic efficiency in spring rapeseed Colza

Genotype	Sowing density	Fertilizing level	Total outgo	Total earnings	Benefit Lei/ha	Benefit rate (%)
Heros	75 g.k../sq.m.	2t/ha	2300,4	2698,6	+ 398,2	+ 17,3
		3t/ha	2509,1	2771,0	+ 262,0	+ 10,4
		4t/ha	2719,1	2869,9	+ 150,8	+ 5,5
	100 g.k../sq.m.	2t/ha	2325,0	2674,4	+ 349,4	+ 15,0
		3t/ha	2533,7	2403	- 130,7	- 5,1
		4t/ha	2743,7	2641,1	- 102,6	- 3,7
	125 g.k../sq.m.	2t/ha	2357,7	2327,1	- 306,0	- 12,9
		3t/ha	2566,5	2293,8	- 272,7	- 10,6
		4t/ha	2776,5	2326,0	- 450,5	- 16,0
Olindingo	75 g.k../sq.m.	2t/ha	2300,4	2664,1	+ 363,7	+ 15,8
		3t/ha	2508,7	2934,3	+ 425,6	+ 16,9
		4t/ha	2719,1	2990,7	+ 271,6	+ 9,9
	100 g.k../sq.m.	2t/ha	2325,0	2500,8	+ 175,8	+ 7,6
		3t/ha	2533,7	2477,8	- 55,9	- 2,2
		4t/ha	2743,7	2566,3	- 177,4	- 6,5
	125 g.k../sq.m.	2t/ha	2357,7	2283,4	- 74,3	- 3,1
		3t/ha	2566,5	2338,6	- 227,9	- 8,9
		4t/ha	2776,5	2403	- 373,5	- 13,4
X			2536,8	2564	+ 27,2	+1,1

For both of the rapeseed types Heros and Olindigo, the best results form economic point of view were those at a sowing density of 75 g.k../sq.m. and fertilizing level for estimated

production of 2 t/ha. Along with the sowing density increasing and of the fertilizing norm, and especially theirs combination at average and maximal values, resulted in economical losses, suggesting that the spring rapeseed Colza did not reacted favorable for sowing densities higher than 75 g.k../sq.m., at fertilizer dosages ensuring production higher than 2 t/ha.

CONCLUSIONS

Considering the objective of the study of the spring rapeseed Colza in the year 2006 and the tests results following conclusions could be resumed:

The genetic and technological factors, by their interaction did not influence considerable the productivity elements, which are reflected by the production and its quality.

The number of plants influenced the production. So at the sowing density of 75 g.k./sq.m. best results were ensured, because of, on side a better branches development, more silque and seed in the silque, resulting in a higher production, and on the other side, the sowing norm decreases and therefore the costs are lower.

The hectoliter weight was not influenced by the genotype, but the sowing density is in a positive correlation with the hectoliter weight. With the sowing density increasing, increase the hectoliter weight being in a negative correlation with the one thousands seeds weight. For the third studied factor the tendency was similar, so that when fertilizer dosages is higher, increases the hectoliter weight.

By their interactions, the three factors influenced variably the physical production of the spring rapeseed.

For the two genotypes there were obtained equal production practically for the conditions of the year 2006, the differences being un-significantly.

The sowing density influenced mostly the harvest level, for the variant of 75 g.k./sq.m. the highest production being ensured, the differences between the other sowing densities being considerable 100 and 125 b.g./mp g.k./sq.m..

The fertilizers dosages higher than for estimated production of 2t/ha did not influenced the harvest, probably due to the decreased biologic potential of the spring rapeseed Colza. The reaction of the Olindigo type was more favorable than for Heros.

The oil content and the production per hectare were influenced by the genetic factors as well as by the technological factors.

The oil content Olindigo type is higher than of the Heros, with cca. 1,5%, while the interaction with the sowing density and fertilizing dosage, the average production were very similarly of 733 kg/ha and 728 kg/ha, the differences 5 kg/ha being not notable.

The seeds oil contents and the production of oil differs a little bit for the two types, the average value of 38,85 %, a normal value for the spring rapeseed, while the oil production per hectare present a good value (average value of 730 kg/ha).

The economic efficiency, an important indicator, demonstrated that the rapeseed Colza is an alternative to the autumn type, in the years with frosty winters, devoided by a protective snow layer, when autumn spring can be compromised.

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