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Research regarding the influence of Banat climate conditions on rapeseed production

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Abstract: *The aim of the research was to establish the sowing period and its influence on the harvest and the optimization of mineral fertilization, under the influence of climatic conditions.*
In terms of the period of the beginning of the crop, in all three locations, the highest harvests were obtained in E1 and E2, intervals in which both the percentage at sprouting time and the behavior until the entry into winter were close to optimal.
Due to the problems encountered in the establishment of crops, the results regarding the capacity of the hybrid and the influence of the type of fertilizer cannot be considered conclusive and as a result it is necessary to continue the experiments in the following years

• Introduction

Colza rapeseed is considered to be one of the most important oil seed crop and the plant with the highest content of oil from the *Cruciferae* family. Lately, the colza rapeseed gained advantage as an oil crop due to the scientifical progress in its oil chemical composition and in the higher oil content of its seeds which varies between 42-48%.
Nowadays, the scientifical research is focused on vegetable oils due to their suitability for biofuels.

J. Temmer (1996) enumerates 4 advantages for using vegetable oils as alternative fuel: 1 – renewable energy, 2- side product in agriculture, 3 – non-toxic fuel; biodegradable, 4 – CO_2 cycle enclosure.

• Material and method

The experiences were bifactorial, organized according to the method of subdivided plots, in three repetitions, with the following graduation of experimental factors:.

Factor A – Sowing period with gradations:
a1 – 10-20 VIII
a2 - 21-31 VIII
a3 – 1-10 IX

Factor B – fertilization , with graduations:
b1- NPK 20:20:0
b2- DAP 14:46:0
b3- Duo MPPA 10:24:0 + 0,1Zn + 0,1Br +20 SO3

• Results and discussions

Sowing period	Average Factor B- Type of fertilization			Average Factor A			
	NPK 20:20:0	DAP 18:46:0	Duo MPPA 10:24:0 + 0,1Zn + 0,1Br +20 SO3	Crop kg/ha	%	Difference kg/ha	Significance
E1 -10-20 VIII	3420	3608	4288	3772	100		
E2-21-31 VIII	3180	3253	3328	3254	86	-518	000
E3-01-10 IX	1750	1802	1841	1798	47	-1974	000

Dl 5%= 98 kg/ha; Dl1% = 130 kg/ha; Dl 0.1% = 171 kg/ha.

Average Factor B

Specification	NPK 20:20:0	DAP 18:46:0	Duo MPPA 10:24:0 + 0,1Zn + 0,1Br +20 SO3
Crop kg/ha	2783	2888	3152
%	100	104	113
Difference kg/ha		104	369
Significance			Xx

Dl 5%= 240 kg/ha; Dl1% = 320 kg/ha; Dl 0.1% = 421 kg/ha.

Table 1 Harvest results obtained according to the sowing and fertilization period in 2019 at Jebel

Sowing period	Average Factor B- Type of fertilization			Average Factor A			
	NPK 20:20:0	DAP 18:46:0	Duo MPPA 10:24:0 + 0,1Zn + 0,1Br +20 SO3	Crop kg/ha	%	Difference kg/ha	Significance
E1 -10-20 VIII	3430	3421	3565	3472	100		
E2-21-31 VIII	3802	3841	3900	3848	111	376	xxx
E3-01-10 IX	2061	2065	2190	2105	61	-1367	000

Dl 5%= 68 kg/ha; Dl1% = 91 kg/ha; Dl 0,1% = 120 kg/ha.

Average Factor B

Specification	NPK 20:20:0	DAP 18:46:0	Duo MPPA 10:24:0 + 0,1Zn + 0,1Br +20 SO3
Crop kg/ha	3098	3109	3218
%	100	100	104
Difference kg/ha		11	121
Significance			

Dl 5%= 168 kg/ha; Dl1% = 224 kg/ha; Dl 0,1% = 294 kg/ha.

Table 2 Harvest results obtained according to the sowing and fertilization period in 2019 in Duboz

Sowing period	Average Factor B- Type of fertilization			Average Factor A			
	NPK 20:20:0	DAP 18:46:0	Duo MPPA 10:24:0 + 0,1Zn + 0,1Br +20 SO3	Crop kg/ha	%	Difference kg/ha	Significance
E1 -10-20 VIII	655	721	730	702	100		
E2-21-31 VIII	2100	2227	2328	2218	316	1516	xxx
E3-01-10 IX	1061	1019	1041	1040	148	338	xxxx

Dl 5%= 100 kg/ha; Dl1% = 133 kg/ha; Dl 0,1% = 175 kg/ha.

Average Factor B

Specification	NPK 20:20:0	DAP 18:46:0	Duo MPPA 10:24:0 + 0,1Zn + 0,1Br +20 SO3
Crop kg/ha	1272	1322	1366
%	100	104	107
Difference kg/ha		50	94
Significance			

Dl 5%= 173 kg/ha; Dl1% = 231 kg/ha; Dl 0.1% = 304 kg/ha.

Table 3 Harvest results obtained according to the sowing and fertilization period in 2019 at Stamora Română

• Conclusions

The production of seeds has been influenced to a very large extent by the very low percentage of sprouting , due to the lack of precipitation and the unevenness of their distribution at the level of the experimental zone.

In terms of the period of the beginning of the crop, in all three locations, the highest harvests were obtained in E1 and E2, intervals in which both the percentage at sunrise and the behavior until the entry into winter were close to optimal.

Due to the problems encountered in the establishment of crops, the results regarding the capacity of the hybrid and the influence of the type of fertilizer cannot be considered conclusive and as a result it is necessary to continue the experiments in the years to come.

The highest harvests were registered at Jebel (3772 ka/ha, established culture in E1) and Duboz (3848 kg/ha, established in E2). As regards the type of fertilizer used and the influence on production, it is noted that the highest harvest of 4288 kg/ha was recorded by fertilisation with Duo MPPA10:24:0 + 0.1Zn + 0.1Br +20 SO3, harvest obtained in the Jebel experimental field.