PRELIMINARY STUDIES ON THE PRODUCTION CAPACITY, SEVERAL LINES OF SAFFLOWER (CARTHAMUS TINCTORIUS L.) UNDER CONDITIONS OF TIMIŞOARA

Simona NIŢĂ, Valeriu TABĂRĂ, Ioana Maria MATEAŞ, Liliana PANAITESCU, Marius LUNGU

Banat"s University of Agricultural Sciences and Veterinary Mmedicine,Faculty of Natural and Agricultural Sciences,Timişoara; Ovidius University, Constanţa
E-mail:suveti_s@yahoo.com

Abstract: *Safflower (Carthamus tinctorius L.), as an oil plant, has been known since ancient times. It is cultivated in U.S.A., Israel, Morocco, Spain, Italy, France, Pakistan, Tunisia, India, and Australia. Safflower has been cultivated mainly for the edible oil obtained from its seeds. It is mentioned that safflower oil has wide uses in the pharmaceutical industry, due to its purgative and anti-rheumatism effects. It does not result in an increase of the cholesterol level in the blood. Safflower flowers have tonic properties in cough. Pigments of safflower flowers are particularly important because they leave no toxic residues in coloured products. Pigments are synthesised in the root where, during vegetation, they migrate towards leading tissues towards the petals.The oil is used as a remedy for rheumatic pains. Outside the fatty acid content of 32-40% and a percentage seeds contain 11-17% protein and 4-7% water. Carthamine is one of the most valuable non-toxic compounds used in the food industry or in the textiles industry. Results obtained recently in China concern the use of safflower flowers-based medicines with good effects on coronary diseases and on angina pectoris, curing 75.6% of the total patients treated. The incidence of re-occurrence of cardiac crises as well as of side-effects is rarer than in the case of nitro-glycerine-based medicines. In order to reach the goals of our research, we used 4 safflower lines obtained through individual selection from a population of Timişoara.To emphasise the yielding capacity of some new lines of safflower (Carthamus tinctorius L.) under study, we organised, in 2012 a bi-factorial experiment in which experimental factors were as follows: Factor A – sowing time - 1st time* ***MARCH****; - 2nd time* ***APRIL****; Factor B – safflower lines -T 9, -T 10, -T 33, -T 40 short line. Research carried out pointed out the impact of sowing time on yield as a result of testing new lines of safflower.*

Key word: *safflower, lines, yield*

INTRODUCTION

Safflower (Carthamus tinctorius L.) is important as oil plant in Asia, North and Central America and in dry areas with poor soils. Due to its rich fruit oil: 30-35% was introduced in our country in human nutrition, dietetics and food but reducing the amount of cholesterol in the blood. The fruits and flowers are also used in medicine since they have hydrogogue purging and anticough properties. Due to the content of pigments in the petals (20% yellow pigments and 0.5% red pigments), they can be used to produce natural colouring agents for the food, textile, pharmaceutical, and cosmetics industry.

MATERIALS AND METHODS

Experimental field was located on a wet soil type mold bill (Gleize weak), weak decarbonat on lösoide deposits, clay argilo-prăfos/luto-argilos.

Experience has been placed in the field after bifactorială method in which experimental factors were:

Factor A – sowing time

- 1st time ***MARCH***
- 2nd time ***APRIL***

Factor B – safflower lines

- T 33, T 9, T 10, T 40 short.

Settlement field experience was the method blocks with plots randomized.

Experimental variants were placed in three repetitions with randomisation factor B (safflower lines). Production results were calculated and interpreted by analysis of variance method and the biometric features were calculated and interpreted by the method of variation of the string.

Except when sowing which was established in factor experienced safflower technology applied to culture was the high culture specific. Plant prior to culture was safflower winter wheat.

Fertilization culture was made using complex fertilizers such N15P15K15 the amount of 450 kg / ha complex which meant 70 kg / ha to of each N, P and K. Basic plowing to 20-22 cm depth was performed. Germinative bed was processed and uniform through the combinatorial work in the fall. In the spring two-three days before sowing, to work with combinatorial to break the crust and destroying weeds east.In the first decade of March, the distance between rows of 50cm was used. During the growing season were carried out density correction in turn.

The work was performed when plants reached the 2-5 leaf stage plants were left each other at a distance of 8-10 cm.

RESULTS AND DISCUSSION

Yields were obtained by harvesting the two epochs. Highest production was recorded at 1st time. Obtained at each post-harvest production was cleaned of impurities and eighed. Calculation and the result was interpretation variance analysis method (N.N. Saulescu 1967).

YIELD RESULTS OBTAINED FROM SAFFLOWER IN MARCH 2012

Production obtained from each experimental variant was weighed, calculated and interpreted by means of analysis of variance (NN Săulescu 1967) Table 1.1. and figure 1.2. are presented in safflower seed yields obtained by sowing in March 2012.

Analysis of the results shows that the line T33 obtained the highest yield - 2186 kg / ha, which means an increase of 220 kg / ha to witness production population of Timisoara.

The allowance is provided statistically significant.

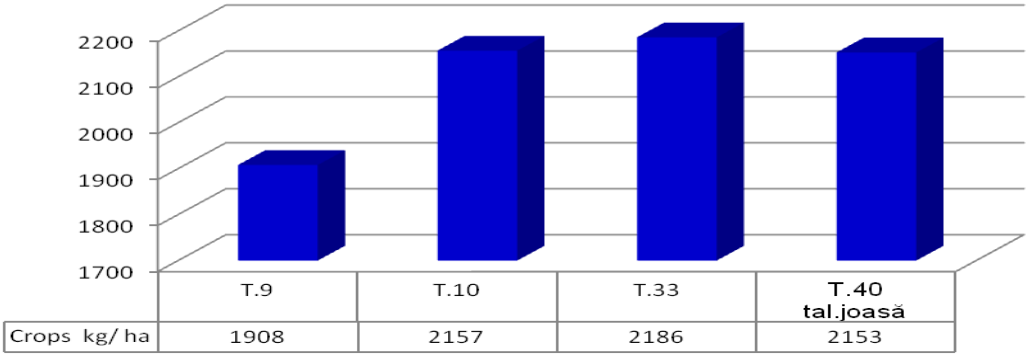

Figure 1.1.Variation production in safflower by sowing in March to SDE Timişoara

The T9 line showed the lowest yield (1908kg/ha). Overall it appears that if sowing in march three of the four lines (T10, T33, T40 tj.,) Are superior in terms of production T9.

Table 1.1

Safflower seed yield in the 1nd time (sowing in March)
in 2012 at the E.D.S. in Timişoara

Nr.crt.	Lines	Crops kg/ ha	%	Diference kg/ ha	Significance
1.	T.9	1908	100	-	
2.	T.10	2157	113	249	x
3.	T.33	2186	115	278	xx
4.	T.40 tal.joasă	2153	113	245	x

DL 5%= 189 kg/ha; DL 1% = 257 kg/ha; DL 0,1% = 346 kg/ha

The analysis of the results shows that three lines have a superiority in terms of production than production of T9. These lines T10, T33 and T40 low waist. Of the three lines T9 prouction top line, the two are statistically significant differences recorded 249kg/ha and 245kg/ha. This difference in line T33, (278kg/ha), is provided statistically significant.

YIELD RESULTS OBTAINED FROM SAFFLOWER IN APRIL 2012

Regarding the results obtained by sowing in april 2012 shows that production is much lower than that achieved by sowing in March. This is due to the less favorable conditions germination and plant safflower east. Figure 1.2. are negative lines of the safflower yields compared to production by the line T9.It highlights the extremely low level of yields obtained by sowing safflower in april.

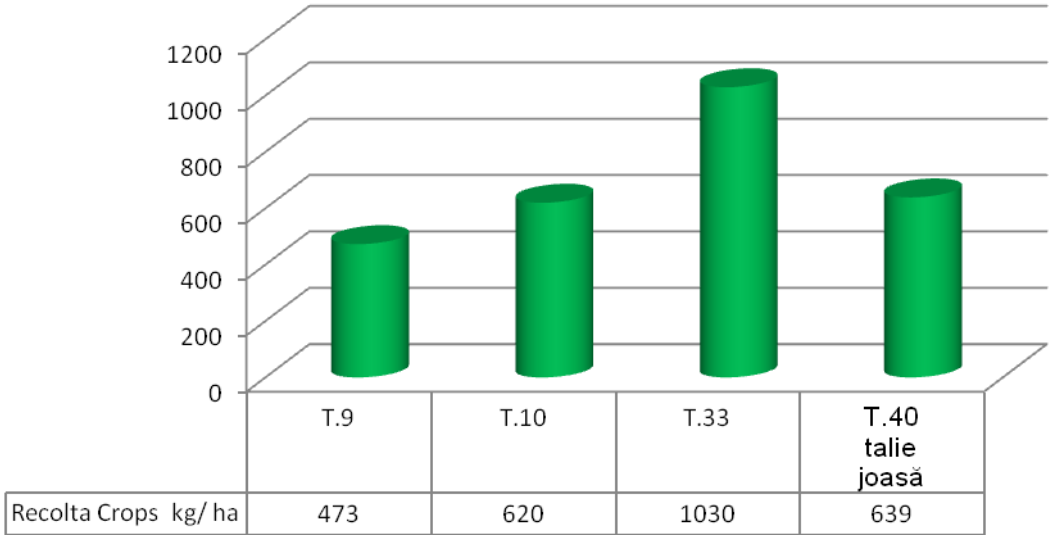

Figure 1.2. Variation yield at safflower sowing April in 2012 at the S.D.E.Timişoara

Table 1.2.

Safflower seed yield in the 2nd time (sowing in April)
in 2012 at the E.D.S. in Timişoara

Nr.crt.	Liniile Lines	Recolta Crops kg/ ha	%	Diferența Diference kg/ ha	Semnificația Significance
4.	T.9	473	100	-	
5.	T.10	620	131	147	
7.	T.33	1030	218	557	xxx
9.	T.40 talie joasă	639	135	166	

DL 5%= 317 kg/ha; DL 1% = 358 kg/ha; DL 0,1% = 395 kg/ha

With safflower sowing in April compared with those achieved by sowing in March are lower. The best behavior in terms of a production line is T33, obtaining a yield of over 1000 kg / ha, respectively 1030kg/ha, achieving a production increase of 557kg/ha, being provided statistically very significant. Analysis of the results shows that 3 of the 4 lines of safflower analyzed ensure higher production achieved T9 line. (Table 1.2.).

PRODUCTION RESULTS FROM THE INFLUENCE OF TIME OF SOWING SAFFLOWER IN 2012

Table 1.3.

Yield results from the influence of time of sowing safflower in 2012

Sowing time	Safflower lines				crops kg/ha	%	Diference +/- kg/ha	Significance
	T.9	T.10	T.33	T.40 tal.j				
a1 martie	1908	2157	2186	2153	2101	100	-	
a2 aprilie	473	620	1030	639	691	33	-1410	000

DL 5% = 306 kg/ha; DL 1% = 416 kg/ha; DL 0,1% = 620 kg/ha

Average production of factor B

	Lines			
	T.9	T.10	T.33	T.40 tal.j
Crops	1191	1389	1608	1396
%	100	117	135	117
Diference	-	198	417	205
Significance		x	xxx	x

DL 5% = 189 kg/ha; DL 1% = 239 kg/ha; DL 0,1% = 348 kg/ha

Production results obtained in 2012din interaction of experimental factors under study are presented in table 1.3. And in terms of 2012 shows that delaying sowing reduction production by 33% at sowing in April.

It is worth noting that the average yields (table 1.3.) lines is studied over 2000 kg / ha which shows that new lines have good production potential. This assertion lines T10, T33, T40 low waist, where the yield is 2000 kg / ha. It is worth noting that all lines studied beyond the point of production, its output line T9 - 1908kg/ha.If we analyze the average yields achieved new safflower lines studied the influence of two planting dates we find that the level of these productions is affected by sowing time in that late sowing very significant decrease production -1410kg/ha differences in sowing in April, being statistically significant as very negative.

Of the 4 lines of safflower studied three seeds production is higher than the T9 line differences or production increases made in 2012 to the production line as T9 are statistically significant and very significant (T33 line, with an increase of production of 417 kg / ha).

CONCLUSIONS

1. Conditions are favorable for growing Timisoara yet safflower sowing period without differences of production.
2. The first time sowing lines were observed T-9 and T-33 of production between 1908 and 2186kg/ha.

3. Drought followed by heavy rains during the summer caused low yields obtained in the second period of sowing.
4. The highest production was recorded at age II line T-33 (1030 kg / ha) but which is not favorable for safflower.

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