PRELIMINARY STUDY ON CONTENT AND OIL PRODUCTION IN SOME LINES SAFFLOWER (CARTHAMUS TINCTORIUS L.) UNDER TIMISOARA

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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 2013 a bi-factorial experiment in which experimental factors were as follows:

Factor A – sowing time
- 1st time ***APRIL***
- 2nd time ***MAY***
Factor B – safflower lines
- *T 9,*
- *T 10,*
- *T 33,*

T 40 short line.
** T - Timişoara*

Research carried out pointed out the impact of sowing time on yield as a result of testing new lines of safflower.

Key words: *safflower, lines, oil*

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 ***MAY***

Factor B – safflower lines
- T 9, T 10, T 33, T 40 short.

* T - Timișoara

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

Oil yields were obtained by harvesting the two epochs. Most oil production was recorded at age I. Calculation and interpretation of the result was done by analysis of variance method (N. SĂULESCU 1967). Results obtained safflower oil production in 2013 Safflower seed oil content in March 2013 are shown in Figure 1.

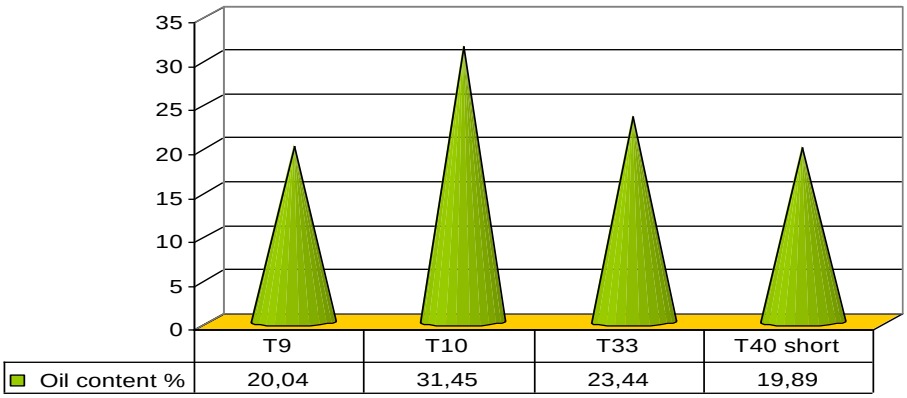

Figure 1. The oil content of safflower seeds sown in march in Timisoara

It is important that some new lines studied safflower sown in March have an oil content well above the low waist made of T40 (19.89 %). The highest oil content in seeds in terms of 2013 occurs at T lines 10 to 31.45 % and T 33 to 23.44 % .

Of the four three -line safflower oil contents in excess in terms of the seeds , the oil content of the line T- 40 seeds low rise .

For safflower seed production in March is an outcome given crop product - oil content and is represented in Table 1.

The analysis of the production of oil from oil production finds dependence on all four lines seeds and the oil content thereof. The highest yields of safflower seed oil in March 2013 under the lines is achieved T10 886 kg / ha of oil and low waist T40 - 678 kg / ha oil T33 - 659 kg / ha oil. From the results it appears that there is a high variability in seeds oil content in the 4 types of safflower tested. This variation falls within the range of 608 % to the oil line 886 to the line T9 and T10 . And in 2013 variant sown in March in line T10 obtain the highest yield of oil (886 kg / ha).

Table 1.

Oil production obtained in March in Timisoara

Nr.crt.	Lines	Crops kg/ha	%	Diference kg/ ha	Significance
1.	T.9	608	100	-	
2.	T.10	886	146	278	xxx
3.	T.33	659	108	51	
4.	T.40 short	678	112	70	

DL 5% = 149 kg/ha; DL 1% = 192 kg/ha; DL 0,1% = 246 kg/ha

Safflower seed oil content in may 2013 in Timisoara conditions is shown in figure 2.

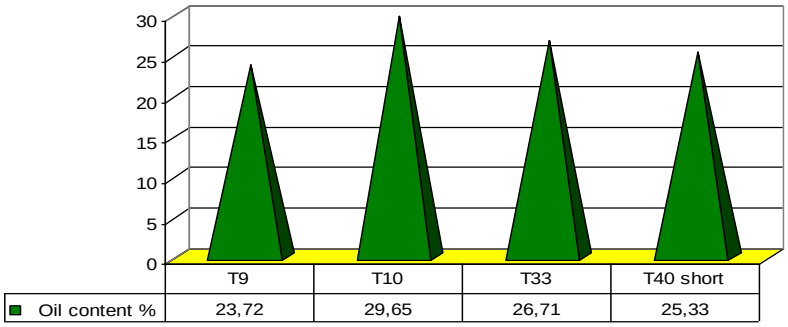

Figure 2. The oil content of safflower seeds sown in may in Timisoara

Analysis of oil content in safflower seeds sown in May in the climatic conditions of the year 2013 reveals that three of the four new lines of safflower have a higher oil content in seeds than in the control variant T9 (23.72 %) .

The high content of oil is achieved on the lines T seeds from 10 to 29.65 % T 33 to 26.71 % .

It is in terms of 2013 , in terms of oil content stands T10 line .

If we compare the oil content in safflower seeds sown in March and safflower sown in May found that by sowing in May oil content in all variants increase by at least 2-3 % .

From safflower seed oil production in May 2013 are shown in Table 2.

Three new lines of safflower production tested in experimental field Higher oil are witness T9 .
These lines are T10 - 968 kg / ha ; T33 - 793 kg / ha , and low waist T40 - 727 kg / ha .
What is important to note is the fact that by late sowing (30 days compared to the optimal sowing safflower) can get the yield and oil production provides some much greater than that achieved in sowing safflower in march (optimal time) due to favorable climatic conditions the sowing II era .

Table 2

Oil production obtained in may in Timisoara

Nr.crt.	Lines	Crops kg/ha	%	Diference kg/ ha	Significance
1.	T.9	678	100	-	
2.	T.10	968	143	290	xxx
3.	T.33	793	117	115	xx
4.	T.40 short	727	107	49	

DL 5% = 109 kg/ha; DL 1% = 201 kg/ha; DL 0,1% = 265 kg/ha

CONCLUSIONS

From the results of the oil production 4 variants sown in the two periods (march and may) of 2013 shows that:

- safflower oil production is dependent on the yield level,
- seeds oil content in the 4 lines of safflower varies greatly

Sowing time given by the difference of climatic factors during growth phases distinguished in turn lead to changes in oil content.
What is found in the analysis of the results is that the seeds oil content increases with delay in sowing.
The conclusion to be drawn is that the matter safflower cultivation, sowing delay does not reduce the production of seeds or oil content in them.

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