Cruciferae Newsletter

July 2018 – vol. n°37

Acknowledgements

The current issue of the Cruciferae Newsletter (vol. 37) is published online from the Brassica website (http://www.brassica.info/info/publications/cruciferae-newsletter.php). The present issue contains 6 contributions in three different topics: Agronomy and variety trial; Breeding strategies and General information on Brassica. Members of the editing board would like to acknowledge the authors for the quality of their contributions. For future issues, we would be gratefull if all the authors could read and follow carefully the author recommendations before submitting their manuscript, in order to facilitate the editing process. In particular, it is necessary to mention one of the listed topics that is the most relevant to the presented work (see the list at the end of the present issue).

Dr. Nathalie NESI on behalf of the editing group

Contact:

UMR 1349 INRA-Agrocampus Ouest-Univ. Rennes1

Institute for Genetics, Environment and Plant Protection

BP 35327, 35653 Le Rheu cedex, France

http://www6.rennes.inra.fr/igepp_eng/

email: cruciferaenewsletter@inra.fr (NEW EMAIL ADDRESS)

VARIABILITY OF SOME PRODUCTIVITY TRAITS UNDER THE CONDITION OF DIFFERENT DENSITY OF SOWING AT THE FALSE FLAX (*Camelina sativa* L. Crantz)

Yakovleva-Nosar' Svetlana*, Lyakh Viktor

Department of landscape industry and genetics, Biological Faculty Zaporizhzhia National University, Zaporizhzhia, Ukraine
*Corresponding author: krokus17.zp@gmail.com

Abstract

The relationship between the density of standing and the width of the rows, on the one hand, and, on the other hand, the variability in the number of fruits on the plant and the mass of 1000 pieces of seeds are analyzed of the three varieties of the spring-sowings false flax. It is established that the configuration and size of the feeding area are essential for the quantitative formation of fruits. There is a tendency to increase the mass of seeds in variants with a smaller number of formed fruits.

Keywords: *Camelina sativa* L. Crantz, number of fruits on the plant, weight 1000 pcs. seed, seeding density, row spacing

Introduction

Recently, the requirements for vegetable oils in Ukraine are provided by growing sunflower. But the development of food and other industries needs to expand the range of vegetable oils. One of the options for solving this problem is the unique fatty acid oil of the spring false flax. Its semi-drying oil is used in metallurgy, paint and varnish production, soap making, in the manufacture of cosmetics, and is also used as a medicine and a prophylactic and a dietary product (Kulakova, 2005).

The prospects for using this culture are determined by a number of its biological characteristics, in particular, resistance to drought and cold, pests and diseases (Komarova, 2001).

The yield of the spring false flax is connected, first of all, with productive branching (Voskresenskaya, 1949).

In connection with the above features of this culture, the aim of the work is to establish the optimal density of standing of the spring-sowing false flax to ensure high yields.

Material and methods

The object of the study was the plants of the spring-sowing false flax (*Camelina sativa* L. Crantz) of three varieties: Zeus, Prestige and Slavutich. Field research was conducted during the growing seasons of 2013-2015 at the experimental field of the Department of landscape industry and genetics at Zaporozhzhia National University. The schematic diagram of the laying of experiments was common to all analyzed varieties. Two density of plants - 200 and 400 pcs / m^2 with a row spacing of 15 and 30 cm were investigated:

- plant density 200 pcs / m^2 with a row spacing of 15 cm (30 plants / row, the area of feeding of one plant is 3.4 × 15 cm^2, or 51 cm^2);
- plant density 200 pcs / m^2 with a row spacing of 30 cm (60 plants / row, feeding area - 1.7 × 30 ^{cm2}, or 51 cm^2);
- plant density 400 pcs / m^2 with a row spacing of 15 cm (60 plants / row, feeding area - 1.7 × 15 cm^2, or 25.5 cm^2);
- plant density 400 pcs / m^2 with a row spacing of 30 cm (120 plants / row, feeding area - 0.8 × 30 cm^2, or 24 cm^2).

A total of 12 variants were analyzed. When studying the morphometric parameters, 30 plants of each variant were selected. The number of fruits on the plant and the weight of 1000 pieces seeds were determined. The data obtained are processed using statistical methods.

Results and Discussion

The obtained data testify to the absence of a significant difference in the number of fruits on the plant between variants with a density of standing of 200 and 400 pieces / m^2 (Table 1). In the varieties of Zeus and Prestige, only a tendency to increase this index was observed with a decrease in the number of plants per unit area with a row spacing of 15 cm. In the Slavutich variety, the number of fruits on the plant was significantly larger in variant 200/15 compared to variant 400/15.

Comparing the variants with different row spacing within a single density of standing, it is evident that at a row spacing of 15 cm, the number of fruits on the plant was much larger than at a distance of 30 cm between rows. In all three varieties, this pattern was observed at 200 plant standstill density / m^2, and in the Zeus variety - also at a density of standing 400 pcs / m^2.

It should be noted that in the 200/15 and 200/30 variants the feeding area of the same plant is the same (51 cm^2), however, these variants differ significantly in the configuration of this area. In the 200/30 variant, the feeding area has the shape of an elongated rectangle, whereas at a distance of 15 cm between the rows the rectangle becomes considerably shorter. Obviously, it is the configuration of the feeding area that enables plants to more effectively use the available resources (nutrients, water). An analysis of the results shows a significant increase in the number of fruits in plant varieties Zeus and Prestige in cases where the shape of the feeding area is close to the square.

We also estimated the variability of such an indicator as the mass of 1000 pcs seeds, with a different density of standing of spring-sowing false flax. There is a tendency to increase the value of this parameter due to a decrease in the number of fruits on the plant. This is due to the improvement in the supply of generative organs (fruits and hence seeds). This is especially evident in the Zeus variety against the background of a high density of plant standing.

Table 1 - Characteristics of the morphometric indices of the generative sphere of the false flax

Trait / Varient	The number of the seeds			Weight 1000 pcs. seed		
	Average value	Mean square deviation	Error of the average	Average value	Mean square deviation	Error of the average
Zeus variety						
400/30	25,87	8,63	1,58	0,86	0,15	0,03
400/15	48,63	21,29	3,89***	0,67	0,15	0,03***
200/30	29,30	13,48	2,46###	0,81	0,16	0,03##
200/15	56,83	26,75	4,88***	0,74	0,10	0,02
Prestige variety						
400/30	34,40	16,82	3,07	0,82	0,22	0,04
400/15	45,47	26,04	4,75	0,74	0,30	0,06
200/30	31,67	19,88	3,63#	0,79	0,30	0,05
200/15	56,20	28,99	5,29***	0,72	0,31	0,06
Slavutich variety						
400/30	42,53	30,08	5,49	0,75	0,17	0,03
400/15	36,27	17,99	3,28	0,64	0,16	0,03*
200/30	29,87	17,72	3,24	0,75	0,17	0,03#
200/15	113,87	67,21	12,27***,+++	0,72	0,12	0,02

Notes: *, *** - the differences between variants with different row spacing within a single density of standing are significant at P <0.05 and 0.001, respectively;

#, ##, ### - the differences between variants 200/30 and 400/15 are significant at P <0,05, 0,01 and 0,001;

+++ - the differences between variants with different density of standing with the same width of rows is essential for P <0.001

References

1. Kulakova S.N., Gapparov M.M., Viktorova E.V. (2005). About vegetable oils of new generation in our nutrition. Fat and oil industry. 1: 4-8.

2. Komarova I.B. Minnivist has figured the yerogo of that new trend of the new material by the method of chemical mutagenesis. Author. dis. Cand. s.-g. sciences. Dnipropetrovsk, 2010. 20 c.

3. Voskresenskaya G.S. (1949). Biology of redhead in connection with the methodology of selection: author's abstract. dis. for the academic degree of Cand. with the sciences.