

THE INFLUENCE OF TECHNOLOGICAL FACTORS ON EARLY WHITE CABBAGE PRODUCTION IN NE OF ROMANIA

INFLUENȚA UNOR FACTORI TEHNOLOGICI ASUPRA PRODUCȚIEI LA VARZA ALBĂ TIMPURIE ÎN NE ROMÂNIEI

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Abstract. *The concept of organic farming aims mainly agricultural ecosystems conservation and getting healthy products for consumers. The premise of obtaining them is influenced primarily by biotope and applied technology. Making crop system of early white cabbage, in optimal conditions, means first satisfying the requirements under best plants to environmental factors. The study aims to address an older problem related to growing white cabbage, but in the implementation of those measures and technological resources in a sustainable system growing, namely, the organic system. The highest early cabbage production during 2006-2008 were obtained from cultivar K001 F1, respectively 32,00 t/ha. Regarding to planting time on early cabbage production, we can say that for the NE area influenced very slightly production,, best results were obtained when planting took place at 07 April, yield being 31,01 t/ha. The best results regarding to the influence of cultivar and planting time, were obtained when K001 F1 cultivar, planted on 07 April (32.84 t/ha).*

Key words: cabbage, cultivar, crop establish, yield

Rezumat. *Conceptul de agricultură ecologică are ca scop principal conservarea ecosistemelor agricole și obținerea de produse sănătoase pentru consumatori. Premiza obținerii acestora este influențată în principal de biotop și de tehnologia aplicată. Realizarea culturii de varză albă în sistem timpuriu, în condiții optime, înseamnă în primul rând satisfacerea în condiții mai bune a cerințelor plantelor față de factorii de mediu. Studiul are ca scop abordarea unei probleme mai vechi legată de cultivarea verzei albe. Reconsiderarea acestei probleme este făcută în contextul implementării acelor măsuri și mijloace tehnologice specifice unui sistem sustenabil de cultivare, și anume, sistemul ecologic. Cele mai ridicate producții la cultura de varză timpurie în perioada 2006-2008, au fost obținute folosind cultivarul K001 F1, respectiv 32,00 t/ha. În ceea ce privește influența epocii de înființare asupra producției la varza timpurie, aceasta este relativ redusă pentru zona de NE a României, dar rezultatele cele mai bune au fost obținute când plantarea s-a efectuat la 07.04, producția fiind de 31,01 t/ha. Influența combinației dintre cultivar și epocă de plantare a scos în evidență că cele mai bune rezultate au fost obținute în cazul cultivarului K001 F1, plantat la data de 07.04. (32,84 t/ha).*

Cuvinte cheie: varza albă, cultivar, epocă de plantare, producție

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INTRODUCTION

The successful of organic cabbage crop in open field is highly dependent on compliance with of technological links, properly applied such as land choice and crop rotation, cultivar selection, establishing time, planting distance, fertilization and crop protection against weeds, pests and pathogenic agents. Cultivation technology should provide technological factors and their values to satisfy the requirements set by ecological growing system, which is very restrictive.

Satisfying the best of the requirements of cabbage to the above environmental factors should be given the natural circumstances of the crop ecosystem, because it is almost impossible to ensure optimal plant conditions they need. Technology can only regulate, to adjust or correct the values of environmental factors, specific measures, which means the establishment of optimal indices of some technological factors.

Also, if we take account the biological and genetic characteristics of the species, shows that this factor can be adjusted by proper choice of cultivars. All this reasons the topic conducting research, optimizing some technological factors of early organic cabbage crop in field conditions. Given the reasons stated, the subject under study is aimed at addressing a problem related to growing older white cabbage, but in the implementation of those measures and technological resources in a sustainable system growing, namely, the ecological system.

Choice of cultivars is one of the most important technological measures that we have to consider the establishment of vegetable crops, mainly due to the climate system in which production is obtained. It should be noted that choosing the most suitable cultivar for a particular vegetable area, does not increase the cost of production, or does it shall costs anything extra for the farmer.

Among the factors that depend on productivity and quality of vegetables is the most important cultivar because its biological and technological potential will be expressed in conditions of appropriate technologies (Stan, 1999, Ciofu, 2003, Munteanu, 2003).

On choosing the most suitable cultivar for head cabbage, will take into account the following criterion: climate and soil conditions, growing place, the goods: fresh consumption, industrialization, seeding dates, planting and harvesting period, resistance or tolerance to pests and diseases, adaptation to extreme environmental conditions, excessive temperatures, high salt tolerance levels, economic use of natural fertilizers, consumer preferences on appearance, taste, size etc.

Certainly, a cultivar can't have all these requirements, but depending on the goods and the requirement of both consumers and farmers preferences, will choose the most appropriate in the circumstances (Dejeu, 1997).

MATERIAL AND METHODS

To achieve its purpose at "V. Adamachi "Teaching Station Iasi, between 2005-2008 has been made in the open field experience, the crop of white cabbage head, the proposed technological factors were studied by work objectives.

For achieving the goal, we plan to make a series of experiences for cabbage crop, with the following objectives:

A.1. The influence of cabbage cultivar on total production;

A.2. The influence of planting time on total production;

A.3. The influence of cabbage cultivar x planting time combinations for the total production;

The biological material used for early white cabbage crop was represented by cultivars, adapted to the microclimate of the NE area of Romania and achieve proposed objectives: Timpurie de Vidra (fig.1.), Dittmark, Golden Acre și K001 F1 (fig.2.);



Fig. 1 - Early cabbage – Timpurie de Vidra (original)



Fig. 2 - Early cabbage – K001 F1 (original)

The experimental designs used in the experiments were such bifactorial experiences adapted goals and objectives which have considered the following factors: cultivar and establishing time (Săulescu, 1967, Jităreanu, 1994).

Considering the importance studying factors in the growing technology, their ability to change, need to study a large number of repetitions each experimental factors, but also taking into account the possibilities of organizing experience for the first series of experience established hierarchy of factors, as follows:

1. A factor – cultivar, with four graduations: Timpurie de Vidra, Dittmark, Golden Acre, K001 F1;
2. B factor – planting time with three graduations: 01.04., 07.04., 15.04.

Collection and processing the experimental data

The trials field crop have been conducted according to technology arising out of the literature consulted (Stan, 2001; Ciofu Ruxandra, Stan N., 2004, Stoian L., 2005), regard being had to key technological measures: land choice, land preparation, crop establishment, the care and harvesting work.

The crop was performed on a level ground, well flattened for application of drip irrigation. The soil is a cambic chernozem leached medium, pelic, epicalcaric, well supplied in nutrients. Prepare the ground was done in stages, in autumn and spring, according to the literature.

Crop establishing was carried out by planting seedlings, at distances and periods specified as experimental variants, about 2 cm depth of above package. Harvested area of experimental plots covered the 30 plants.

The seedlings were produced in the UASVM Iasi greenhouse, at the discipline of vegetable growing, in the cellular trays, with trunk pyramid-shaped of 68 cm³. Harvesting was done manually, at best time of maturity for consumption, since by 10.06 to 15.07.

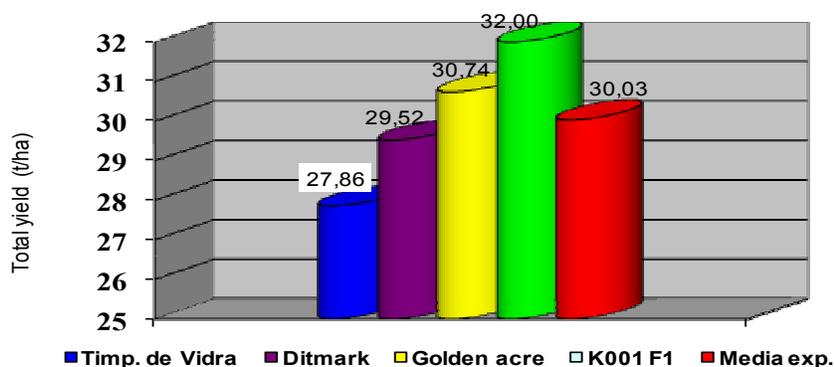
The experimental data collection was carried out observations and biometric measurements, according to the experimental technique used in experiments. The experimental variants were compared to with the average experience, the percentage reporting and differences. The influence of experimental factors was assessed using ANOVA. The significance of differences was assessed on the basis of differences limit for three degrees of confidence (95%, 99%, 99,9%) (Săulescu, 1967).

RESULTS AND DISCUSSIONS

Regarding to the influence of cultivar on total yield of early cabbage crop, during 2006-2008, it ranged from 27.86 t / ha at Timpurie de Vidra to 32.00 t / ha on K001 cultivar.

As with differences obtained from the average experience, one can say that K001 F1 hybrid achieved a significant production, compared with the Timpurie de Vidra, which showed significant differences distinctly negative, respectively - 2.17 t / ha.

The biggest difference between the two cultivars was registered, if comparing the 001 cultivar with Timpurie de Vidra, the difference being 4.14 t/ha. (fig. 3).



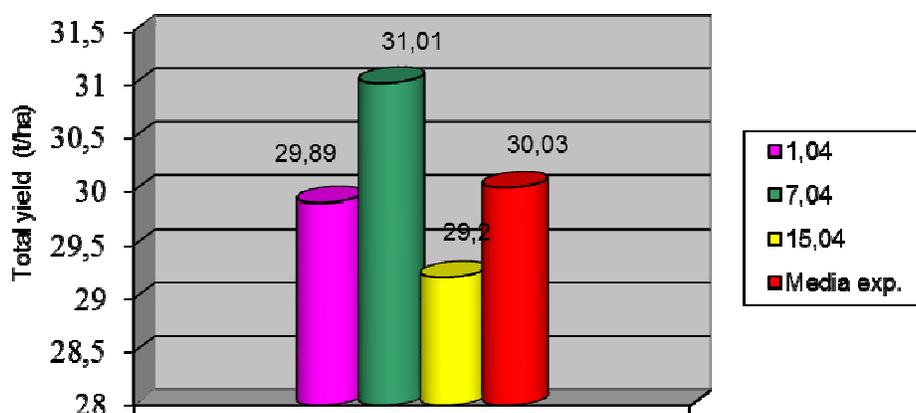
LSD 5%=1,46 t/ha, LSD 1%=2,13 t/ha, LSD 0,1%=3,69 t/ha.

Fig. 3 - Graphic representation of the influence of cabbage cultivar on the early production

The influence of planting time on total production from early cabbage

For early cabbage crop, the established periods have been established for the NE area of the country from: 01.04., 07.04., 15.04.

The results regarding to the influence of established time on early cabbage production are presented in table 2 and fig. 4.



LSD 5%=0,97 t/ha, LSD 1%=1,69 t/ha, LSD 0,1%=2,78 t/ha.

Fig. 4 - Graphic representation the influence of planting time on early cabbage yield

Regarding to the establishing time on early cabbage production, we can say that it ranged from 29.89 t / ha from 31.01 t / ha. So, the planting time does not significantly influenced total production setting than in a very small extent.

The effect of interaction of cultivar and planting period on total production from early crop is shown in table 1. The results presented in the table confirm the interpretation given by the analysis of variance, with large and significant differences.

Table 1

The influence of cultivar x planting time for early cabbages production (2006-2008)

no.	Variant specification	Total yield			
		t/ha	% to the average	differences to the average (t/ha)	significance of differences
1	Timpurie de Vidra x 01.04	27,11	90	-2,92	00
2	Timpurie de Vidra x 07.04	28,99	97	-1,04	-
3	Timpurie de Vidra x 15.04	27,53	92	-2,50	0
4	Dittmark x 01.04	29,72	99	-0,31	-
5	Dittmark x 07.04	30,40	101	0,37	-
6	Dittmark x 15.04	28,43	95	-1,60	-
7	Golden Acre x 01.04	30,94	103	0,91	-
8	Golden Acre x 07.04	31,80	106	1,77	*
9	Golden Acre x 15.04	29,48	98	-0,55	-
10	K001 F1 x 01.04	31,80	106	1,77	*
11	K001 F1 x 07.04	32,84	109	2,81	**
12	K001 F1 x 15.04	31,36	104	1,33	-
x	Media experienței	30,03	100	0,00	-

LSD 5%=1,74 t/ha, LSD 1%=2,67 t/ha, LSD 0,1%=3,87 t/ha

In the total production, varied between 27.11 t/ha if Timpurie de Vidra was planted on 01.04., from 32.84 t/ha if K001 F1 cultivar, planted on 07.04. Commercial production difference obtained between the two combinations of factors was 5.73 t / ha. Positive differences to the average were obtained if K001 F1 cultivar, planted on 01.04. and cultivar Golden Acre, planted on 07.04.

The Dittmark cultivar production achieved exceeds the average experience when the planting time made at 07.04. Significant and distinct significant negative differences were obtained if the Timpurie de Vidra was planted at 01.04 and 15.04.

CONCLUSIONS

1. Regarding to the influence of cultivar on total yield from early crop, during 2006-2008, it varied between 27.86 t / ha from Timpurie de Vidra up to 32.00 t / ha K001 cultivar.

2. In to set up period on early cabbage production, we can say that it varied between 29.89 t / ha to 31.01 t / ha.

3. Regarding the influence of cultivar and planting time on total yield, this varied between 27.11 t / ha if Timpurie de Vidra was planted on 01.04. to 32.84 t / ha at K001 cultivar, planted on 07.04.

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