ANALYSIS OF CROP TECHNOLOGICAL ELEMENTS INFLUENCE ON YIELD OF CUCUMBERS CROP ORGANICALLY GROWN

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Abstract

This study was realized in order to increase quality of cucumber fruit by synthetic chemical disposal, while bringing them some advantages in terms of early maturing, yield and fruit quality, for increasing the economic efficiency of crop.

These objectives were achieved by introducing in the cucumbers under polyetilenne tunnel condition technology of new elements of intensification along with finding the best hybrids adapted to pedoclimatic conditions in the north-western country and which can be applied alternatives crop technology.

Ecological technologies have decisive influence on yield parameters, quality, thus cucumber hybrids at ecological technologies application react differently to those from conventional technology. Some hybrids give good results in conventional agriculture, but in the ecological system profitability is almost impossible to obtain.

Key words: *ecological crop, conventional culture, yield and quality of cucumbers fruits*

INTRODUCTION

Cornichon cucumbers crop, because of lately aggressive changing of climatic conditions, suited much better to crop technologies in protected area and less in the field.

In all countries, major sources of vegetables in protected areas, were introduced in the culture top technologies for increasing the yield and products quality.

Lately, in the west and north-west part of the country were built a series of polyetilenne tunnels, especially around big cities. In this part of the country's climatic conditions due to higher thermal gradient and earliest spring are favorable exploitations in good condition of polyetilenne tunnel, with favorable economic results.

Culture of cucumbers, an important crop for protected areas requires finding solutions to the widespread introduction of modern crops technologies to reduce yield costs and to maximize the natural conditions of climate and soil.

MATERIAL AND METHOD

The experiment was realized in cornichon cucumber crop under polyetilenne tunnel condition in ecological crop system, with mulch variant with black foil using as biological material Szatmár cucumber hybrids F1, Crispina F1, Pasalimo F1, Mirabelle F1 using sowing distance of 20 cm between all plants on row (table 1).

Table 1

Experimental variants

Variant	Crop system	The mulch	Distance between plant /row	Hybrid used
I	a_2 – ecological crop system	m_2 – mulched with black foil	d_1 – 20 cm	h_1 – Szatmar F_1
II	a_2 – ecological crop system	m_2 – mulched with black foil	d_1 – 20 cm	h_2 – Crispina F_1
III	a_2 – ecological crop system	m_2 – mulched with black foil	d_1 – 20 cm	h_3 – Pasalimo F_1
IV	a_2 – ecological crop system	m_2 – mulched with black foil	d_1 – 20 cm	h_4 – Mirabelle F_1

In the ecological crop system of cucumbers under polyetilenne tunnel condition have worked on the idea of using fertilizers and natural extracts for the prevention and control of diseases and pests.

In the fall of each experimental year beginning with soil tillage after previously was disbanded preemergent crop (tomato), crop residues being collected and made compost. Then switched to basic fertilization, applying 70 t / ha decomposed manure.

The next step was the installation of sprinkle irrigation system and soil mulching with black foil.

Establishment of the crop was made by direct seeding in nests, two seeds per plant as research scheme. After schedule the seeding work was done on June 24.

Until the emergence of the plants the irrigation was made with hose mesh, daily on early morning. Because of high temperatures during the day was preferably after emergence (10 days) besides sprinkle irrigation to make irrigation with hose with strainer. Next to the abolition of crop irrigations were made weekly depending on phenophase.

Immediately after emergence was passed to support system installation, using plastic fencing mesh, much easier to install and more efficient for directing the cucumber vine. Both the main stem and lateral shoots were conducting to this fence, making weekly adjustments to the routing.

Particular attention was given to the microclimate from polyetilenne tunnel condition.

In July and August were registered high temperatures under polyetilenne tunnel condition, reaching 40 ° C and even more, using all vent mechanisms.

Air relative humidity ranged between 60-90%. August was just as warm, but air humidity had values about 75-90% because of abundant vegetation. September brought lower temperatures and with decreasing of minimum temperatures outside during night the polyetilenne tunnel was closed.

Using mulch with black foil stopped the apparition of weeds; they appeared only in the traffic alleys, on the edge of polyetilenne tunnel in variants without mulch. Being small areas they were eradicated by repeated hoeing when they were small.

At 15 days after rising was made a fertilization with Agriful 4 l / ha, the work being repeated at 30 and 45 days after rising.

Also administered soak chicken manure (decomposed in water five weeks, dilution 1:9), early flowering and repeating the operation three weeks after the first administration. Were made 6 fertilization extra root with Tecamin Max every 15 days, first applying to the beginning of flowering.

Crop protection against pests and diseases was made by applying repeated treatments at intervals of 10 days alternative with macerate of nettle and equisetum.

It was noticed the occurrence of aphids in the second half of August, but immediately there appeared natural predators (ants and ladybugs) that managed to keep the saddle aphids until the end of vegetation period.

In the last period of vegetation was necessary to make a treatment with soak tomatoes to reduce aphid populations.

Harvests began at the end of July and were held until the beginning of October. The rapid growth of fruit supposed to do every two days and by the end of the growing season at intervals of 3 to 4 days.

As shown in crop technology the intervals which was made the harvests, depending on fruits grows, by 2, respectively 3 and 4 days. As the right moment of harvesting, was chosen the morning time because in that period the fruits are more turgescent.

RESULTS AND DISSCUSIONS

In interpreting the results regarding to the analysis of the influence of plant density and hybrid in crop system with mulch on yield of cucumbers grown under organic crops, in experimentally year 2013 can be

observed (table 2) that the first harvests began in the second decade of July respectively 18th of July. Entire period of harvesting lasted 81 days. Dates regarding at harvesting dynamics monthly and on decades on each variant (average yields) are shown in table 2.

Table 2.

Harvesting dynamics, Husasău de Tinca, 2013 (Kg/m^2)

No. crt.	Variants	Months and decades										
		July		August				September			October	
		2	3	1	2	Early yield	3	1	2	3	1	Total
1	$a_2 m_2 d_1 h_1$ (Szatmar)	0,10	0,28	0,44	0,54	1,36	0,66	0,58	0,43	0,32	0,17	3,52
2	$a_2 m_2 d_1 h_2$ (Crispina)	-	0,21	0,46	0,37	1,04	0,52	0,68	0,40	0,24	0,20	3,08
3	$a_2 m_2 d_1 h_3$ (Pasalimo)	0,15	0,23	0,40	0,40	1,18	0,55	0,48	0,36	0,27	0,20	3,04
4	$a_2 m_2 d_1 h_4$ (Mirabelle)	0,19	0,34	0,39	0,57	1,49	0,48	0,47	0,40	0,25	0,17	3,26

On the same issue but regarding to variant 2 with hybrid Crispina the harvest started later with 7 days.

From that four hybrids studied in the first decade of harvest the best yield registered was at hybrid Mirabelle and Pasalimo (0,19 respectively and 0,15 kg / m^2).

Total yield at cornichon cucumbers was obtained by summing all partial harvests on each variant and repetition until the abolition of crop. The results obtained were statistically analyzed. Total yield of cornichon cucumbers in ecological technology is presented in table 3.

Table 3.

Early production of cucumbers under polyetilenne tunnel condition with ecological agriculture, Husasău de Tinca, 2013 (Kg/m^2)

No. crt.	Variants	Absolute yield Kg/m^2	Relative yield %	± D Kg/m^2	The significance
1	$a_2 m_2 d_1 h_1$ (Szatmar)	1,38	106,97	+ 0,09	-
2	$a_2 m_2 d_1 h_2$ (Crispina)	1,05	81,39	- 0,24	0
3	$a_2 m_2 d_1 h_3$ (Pasalimo)	1,20	93,02	-0,09	-
4	$a_2 m_2 d_1 h_4$ (Mirabelle)	1,51	117,05	+0,22	x
5	Media	1,29	100,00	0,00	-

LDS 5% = 0,13 LDS 1% = 0,27 LDS 0,1% = 0,44

At ecological yield the differences between variants were higher, the only hybrid that was detached towards experience average and the other hybrids was hybrid Mirabelle.

The difference was positive statistically significant at hybrid Mirabelle and negative significant at hybrid Crispina compared with the experience average (table 3).

Although the hybrid Mirabelle was observed with the best early yield in the case of the total amount of cucumbers and obtained a lower increase of the yield compared to control variant with a value about 0,17 t / ha. The difference is very small and was not statistically assured because not overcome the limit of 5% (table 4).

Hybrids Szatmár and Mirabelle were situated less over experience average at early yield and total yield but total yield was close to the experience average value. Differences in comparison with control variant were small and not statistically assured for Mirabelle hybrid and in case of hybrid Szatmár the difference compared to control variant was positive statistically significant.

Table 4

Total yield of cucumbers under polyetilenne tunnel condition with ecological agriculture, Husasău de Tinca, 2013 (Kg/m^2)

No. crt.	Variants	Total yield Kg/m^2	Relative yield %	± D Kg/m^2	The significance
1	a_2 m_2 d_1 h_1 (Szatmar)	3,55	108,89	+ 0,29	x
2	a_2 m_2 d_1 h_2 (Crispina)	3,12	95,70	- 0,14	-
3	a_2 m_2 d_1 h_3 (Pasalimo)	3,07	94,17	- 0,19	-
4	a_2 m_2 d_1 h_4 (Mirabelle)	3,29	100,92	+ 0,03	-
5	Media	3,26	100,00	0,00	-

LDS 5% = 0,25 LDS 1% = 0,43 LDS 0,1% = 0,71

CONCLUSIONS

A general conclusion of this study is to develop crop variants that increase the quality and yield of cucumbers under polyetilenne tunnel condition in ecological system and to increase the economic efficiency of the crop.

1. From these four hybrids studied in the first decade of harvest the best yield was registered at hybrid Mirabelle (0,19 kg / m^2).

2. It can be concluded that mulch with black foil with all its advantages had a great influence on yields.

3. In variants with cucumbers under polyetilenne tunnel condition in ecological crop system, harvesting dynamics shows the balanced levels of yield.

4. Hybrids Crispina and Pasalimo were situated under experience average at early yield and total yield but total yield was close to the experience average value. Differences in comparison with control variant were small and not statistically assured.

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