

RESEARCHES CONCERNING THE INFLUENCE OF SOIL MULCHING WITH POLIETHYLENE, BLACK AND TRANSLUCID FOLIO FOR TOMATO CROP IN PLASTIC GREEN HOUSES

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Abstract:

Improving technology for tomato crop was always an issue of great interest for researches due to its importance and to the big surfaces that are tilled.

The introduction in the crop technology of mulching in a plastic green house was the main reason for important benefits in yield, a superior quality of tomato fruits and a superior early yield.

Key words : hybrid, tomatoes, plastic green house covered with folio, mulching, black folio, translucid folio.

INTRODUCTION

The economical crisis and the competition in the vegetable market, requires some technical solutions for decreasing the costs of production. Because of the drought that keeps going on in the last years, the correct usage of water for irrigations and decreasing the damage throughout evaporating are the only methods of increasing the yield without simultaneously increasing the costs of production.

In our country, tomato crop is more and more frequent, on one hand because of considerable decrease of glass hot house surfaces and on the other hand because of the difficulties occurred at the field crop.

MATERIAL AND METHOD

This experience was done in a micro farm of vegetables in the north-west of the country in 2005-2007 (two thousand five- two thousand seven) and its main material was the tomato biological hybrid Cristal F1. The researches referred to the influence of soil mulching with black folio and translucid folio for tomato crop in plastic green houses.

The experimental alternatives were put three times in subdivided groups (blocs). The experimental lot was of 12 m². The number of plants to harvest for the experimental lot was of 46. The statistic processing of data experiment was done through the analysis of the alternative.

RESULTS AND DISCUSSION

The harvest of tomato fruits was done in alternatives and repetitions from the arising of the first fruits to the elimination of the crop.

The data concerning the influence of mulching for the early yield can be seen in Table 1. Generally, the medium values of early yield show a very strong influence of soil mulching for tomato crop in plastic green houses in all the three experimental years.

In the case of soil mulching with translucent folio in 2005, the benefit of early yield compared with the unmulched alternative was of 82.5 per cent(%),(22.26 t/ha) and in the case of soil mulching with black folio the benefit was of 73.6 per cent (17.17 t/ha) Both differences are very important. In 2006 the benefit of early yield was of 75.7 per cent for soil mulching with translucent folio comparing to the unmulched alternative and of 52.8% in the case of black folio.

The differences are very important. The amount of harvested tomatoes for soil mulching with translucent folio alternative was bigger with 4.93 t/ha than in the case of soil mulching with black folio showing thus a distinctively important difference.

The same strong influence was to be seen in 2007, when the yield benefit in the case of translucent folio compared to the unmulched crop was of 93,9%, and for soil mulching with black folio alternative it was of 60,0%.

As a matter of fact, the year 2007 registered the biggest benefits for the early yield in what concerns the mulched alternatives compared to the unmulched ones.

The influence of soil mulching for early yield presented separately each year is reflected normally on the medium values.

Thus, compared to the unmulched alternative, the medium benefits of production were of 82.4% for soil mulching with translucent folio and of 58,7% for the black folio. The total benefit was achieved by summing up all the partial crops to each alternative and repetition, till the elimination of the crop in each of the three experimental years. (Table 2) The influence of soil mulching for the total benefit, confirms once again the advantages of mulching in all the studied years of harvest.

In 2005 both mulched alternatives led to benefits for the whole yield- very significant benefits of 18,1% for the translucent folio and of 22.2% for the black folio compared to the unmulched crop.

To the same alternatives, in 2006 and 2007, bigger benefits were registered: of 20,7% and 19,1 % for the translucent folio , of 32,5% and 24,5 % for the black folio compared to the unmulched alternative.

In all three years, the mulched alternatives realised very important increases compared to the unmulched alternative. Naturally, also in the case of total yield average of the three years, the mulching with black folio assured the highest yield benefit of 23.23 t/ha, followed by the benefit of 17,02 t/ha for the translucent folio compared with the unmulched alternative. The difference of 6,2 t/ha between the two methods of mulching is distinctively important.

Analysing the quality of the tomato fruits all way along the experiences, one can notice that generally it has been obtained quality fruits, with more or less differences according to the alternative. The commercial quality of the fruits is showed in Table 3. The mulched alternatives influence positively the quality of the benefit for tomatoes. In this order, for the alternatives mulched with translucent folio, the percentage of extraquality fruits varies from 80,2% to 81,2%; for the alternatives with black folio varies from 77.8% to 80,3 %, while for the unmulched alternatives the following values were registered 66,2% and 70,9% from the total of the benefit.

Table 1

The influence of soil mulching on tomatoes early yield in solarium, Husasău de Tinca, 2005-2007

Mulching methods	2005				2006				2007				2005-2007			
	t/ha	± D	%	Semnf.	t/ha	± D	%	Semnf.	t/ha	± D	%	Semnf.	t/ha	± D	%	Semnf.
Unmulched	26,97	-	100	-	28,50	-	100	-	26,35	-	100	-	27,28	-	100	-
Translucid folio	49,23	22,26	182,5	xxx	48,93	20,43	175,7	xxx	51,10	24,75	193,9	xxx	49,76	22,48	182,4	xxx
Black folio	44,14	17,17	173,6	xxx	43,55	15,05	152,8	xxx	42,17	15,82	160,0	xxx	43,26	16,01	158,7	xxx
LSD	p 5% = 3,33				p 1% = 4,47				p 0,1% = 5,90				p (5%) 1,42 p (1%) 1,96 p (0,1%) 2,69			

Table 2

The influence of soil mulching on tomatoes total yield in solarium, Husasău de Tinca, 2005-2007

Mulching methods	2005				2006				2007				2005-2007			
	t/ha	± D	%	Semnf.	t/ha	± D	%	Semnf.	t/ha	± D	%	Semnf.	t/ha	± D	%	Semnf.
Unmulched	89,76	-	100	-	85,52	-	100	-	89,69	-	100	-	88,32	-	100	-
Translucid folio	106,03	16,27	118,1	xxx	103,22	17,70	120,7	xxx	106,79	17,10	119,1	xxx	105,34	17,02	119,3	xxx
Black folio	109,68	19,92	122,2	xxx	113,30	27,78	132,5	xxx	111,68	21,99	124,5	xxx	111,56	23,23	126,3	xxx
LSD	p 5% = 6,62				p 1% = 8,92				p 0,1% = 11,84				p (5%) 3,67 p (1%) 5,06 p (0,1%) 6,97			

Table 3

The commercial quality of tomatoes

Variants	2005					2006					2007				
	Total yield t/ha	Yield quality (t/ha)			Extra Qual. from Total (%)	Total yield t/ha	Yield quality (t/ha)			Extra Qual. from Total (%)	Total yield t/ha	Yield quality (t/ha)			Extra Qual from total (%)
		Extra	.I Qual	.II Qual.			Extra	Cal.I	Cal.II			Extra	.I Qual.	.II Qual.	
Unmulched	88,73	62,83	18,34	7,56	70,9	86,70	60,75	18,28	7,67	70,1	97,3	64,40	25,48	7,42	66,2
Translucid folio	108,13	86,72	15,83	5,58	80,2	106,50	85,40	17,25	3,85	80,2	109,2	88,70	15,75	4,75	81,2
Black folio	115,17	92,32	16,65	6,20	80,3	113,50	88,60	22,15	2,75	78,1	117,8	91,65	22,85	3,33	77,8

CONCLUSIONS

From the researches done between 2005-2007 concerning the influence of soil mulching using polyethylene translucent and black folio by introducing new technological elements, we may sum up:

1. the soil mulching for tomato crop influences strongly the vegetation and fructifying of plants because of increasing from the start the thermic degree of soil.
2. the benefits for the mulched alternatives are much earlier, the dynamic of harvest is in advantage of turning the account – a comercial one; a bigger and of more quality benefit compared with the unmulched alternative.
3. the soil mulching in a plastic green house leads to a necessary technical way – irrigation and even fertilizing through dripping.
4. besides the advantage of reducing the water evaporating from the soil, mulching with black folio is also a way fighting against the weeds and it can be used in ecological vegetable growing.
5. the mulching with translucent folio is better because of a more warmed up soil, but the method has to be associated with the elimination of weeds.

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