

THE RESEARCHES FOR PRODUCTION OF HYBRID SEEDS AT CUCUMBER

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INTRODUCTION

The cucumber seed production has a special technology because the flowering plants require cross pollination (Maria Calin et al., 1999; Kremen, 2001; McCormack., 2005). In hybrid seed production, cucumbers are pollinated by honeybees, bumblebees or hand pollinating (Calin, 1999). Many farmers rent honey bee colonies to provide pollination services for their crops (Kremen, 2001). In the present paper the authors presents how the type of pollination is influencing the hybrid seed production.

MATERIAL AND METHODS

1. The influence of sowing time and period of planting over the number of fruits/ plant. The trials were performed in two variants. Each variant had two parental lines for each cucumber hybrid. The sowing time for seedling production was for V1 in 2nd decade of April and for V2 in 3rd decade of May. The seedlings were planted in the field for V1 in 3rd decade of May and for V2 in 3rd decade of June.
2. The influence of pollination method over the number of fruits/plant. The trials were performed in four variants, each variant having two parental lines for each cucumber hybrid. Each variant was placed in a tunnel with 156 m² surface and covered with polystyrene and textile nets for good isolation of pollination fauna. For the seed production at the hybrids Cornișă F1, Cornibac F1 and Cornirom we used the honey bees in order to pollinate the female flower. The control variants are represented by the hand pollination.

In order to pollinate the parental lines a honey bee colony with 4 frames and queen were used in each tunnel.

RESULTS AND DISCUSSION

1. The influence of sowing time and period of planting over the number of fruits/ plant. The results are showed in table 1. The utilization of honey bees for hybrid seed production permitted a good fruition and ripening of the fruits per plant in V1. The average number of fruits/plant at the variants with honey bees was 5,2. On the variant V2 (planting of seedling in the 3rd decade of May) the number of ripening fruits /plant was very low due to the fact that the temperature in August was very high (35 / 37 °C).
2. The influence of pollination method over the number of fruits/plant.

The utilization of honey bees for the seed production at the hybrid Cornirom F1 (table 2) permitted a good fruition and ripening of the fruits per plant. The average number of fruits per plant was 5.2 comparing with hand pollinating (0.9 fruits per plant). The fruit's length and diameter was insignificant influenced by pollinating method (table 2). The number of seeds in fruit was with 46.4% higher than the control. The quantity of seeds per fruit was with 150 % higher than the control. The obtained results show that the honey bees pollination is the best method for the hybrid seed production because the quantity of seed increase with 50%. The results obtained at the variant with honeybees for Cornibac F1 seed production is presented in table 3. As you can see in table 3, also in the case of Cornibac F1 seed production the utilization of honeybees for the pollination of parental lines is a much better variant and this is due to the fact that the number of the fruits per plant and also the quantity of seeds is much higher than the control (202,3%).

In table 4 are synthesized the results obtained for the trials with the implication of honey bees in the pollination process for the production of hybrid seeds at the hybrid Cornișă F1, in comparison with the same hybrid but hand pollinated. The dates obtained in our experiments proved the superiority of the method with honey bees pollination, the dimension of fruits, the number of seeds, the quantity of seeds per fruits being with 214,1% higher than the control.

ABSTRACT

The paper presents the results of researches performed upon the use of bees in the seed production processes at 3 cornichon type hybrids (Cornisa F1, Cornibac F1, and Cornirom F1).

The results shows a very high efficiency of honey bees in pollination of cucumber flowers, resulting in an increase of seed quantities per fruit ranging from 150% (Cornirom F1) to 214,1% (Cornisa F1), as compared to manual pollination.

The number of seeds in fruit was with 46.4% higher than the control. The quantity of seeds per fruit was with 150 % higher than the control.

The obtained results show that the honey bees pollination is the best method for the hybrid seed production because the quantity of seed increase with 50%.

The dates obtained in our experiments proved the superiority of the method with honey bees pollination, the dimension of fruits, the number of seeds, the quantity of seeds per fruits being with 214,1% higher than the control.

CONCLUSIONS

1. The influence of sowing time and period of planting over the number of fruits/ plant.

The utilization of honey bees for hybrid seed production permitted a good fruition and ripening of the fruits per plant in V1. The average number of fruits/plant at the variants with honey bees was 5,2.

On the variant V2 (planting of seedling in the 3rd decade of May) the number of ripening fruits /plant was very low due to the fact that the temperature in August was very high (35 / 37 °C).

2. The influence of pollination method over the number of fruits/plant..

The utilization of honey bees for the seed production at the hybrid Cornirom F1 (table 2) permitted a good fruition and ripening of the fruits per plant. The average number of fruits per plant was 5.2 comparing with hand pollinating (0.9 fruits per plant).

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Table 1. The influence of time sowing and period of planting in number of fruits per plants

No.	Specification	Total	Pollination	
			Honey bees	Handling
V1 The sowing in 3rd decade of April, the planting in 3rd decade of May				
1.	No. ripening fruits /plant	6,1	5,2	0,9
2.	No. hand pollinating /plant	2,5	x	x
- Fruits /plant - no.		0,9	x	x
%		36	x	x
V2 The sowing in 3rd decade of May, the planting in 3rd decade of June				
1.	The average of ripening fruits /plant	1,3	1,1	0,2
2.	No. hand pollinating /plant	3,0	x	x
- Fruits /plant - no.		0,2	x	x
- %		6,6	x	x
Table 2 - Utilization of honeybees and hand pollinating (control) for Cornirom hybrid seed production				
No.	Specification	Total	Pollination	
			Honey bees	Handling
1	2	3	4	5
1.	Number fruits /plant	6,1	5,2	0,9
2.	No. hand pollination/plant	2,5	x	x
- Fruits/plant - no.		0.9	x	x

	- %	36	x	x
3. Length of fruits	- (cm)	x	17,4	18,3
	Difference comparing with control - (cm)	x	- 0,9	-
	- %	x	x	-
4. Diameter of fruits	- (cm)	x	6,0	5,6
	Difference comparing with control - (cm)	x	0,4	-
	- %	x	107,1	-
5. No. seeds in fruit		x	227,2	155,2
6. Difference comparing with control - no.		x	72,0	-
	- %	x	146,4	-
7. The quantity of seeds/fruit	- (g)	x	7,5	5,0
	Difference comparing with control - (g)	x	2,5	-
	- %	x	50	-

Table 3 - Utilization of honeybees and hand pollinating (control) for Cornibac hybrid seed production

No.	Specification	Total	Pollination	
			Honey bees	Handling
1	2	3	4	5
1. Number fruits /plant		6,2	0,8	5,4
2. No. hand pollination/plant		1,7	x	x
	- Fruits/plant - no.	0,8	x	x
	- %	47,6	x	x
3. Length of fruits	- cm	x	16,9	13,7
	Difference comparing with control - cm	x	3,2	-
	- %	x	123,4	-
4. Diameter of fruits	- (cm)	x	6,1	4,7
	Difference comparing with control - (cm)	x	1,4	-
	- %	x	129,8	-
5. No. seeds in fruit		x	258,9	124,8
6. Difference comparing with control - no.	x	134,1	-	
	- %	x	207,5	-
7. The quantity of seeds/fruit	- (g)	x	8,5	4,2
	Difference comparing with control - (g)	x	4,3	-
	- %	x	202,4	-

Table 4 - Utilization of honey bees and hand pollinating (control) for Cornisa hybrid seed production

No.	Specification	Total	Pollination	
			Honey bees	Handling
1	2	3	4	5
1. Number fruits /plant		6,4	5,0	1,4
2. No. hand pollination/plant		2,6	x	x
	- fruits/plant - no	1,4	x	x
	- %	53,8	x	x
3. Length of fruits	- cm	x	17,3	15,0
	Difference comparing with control - cm	x	2,3	-
	- %	x	115,3	-
4. Diameter of fruits	- (cm)	x	6,6	6,2
	Difference comparing with control - (cm)	x	0,4	-
	- %	x	106,5	-
5. No. seeds in fruit		x	256,3	119,9

6. Difference comparing with control - no.	x	136,4	-
- %	x	213,8	-
7. The quantity of seeds/fruit - (g)	x	9,1	4,3
Difference comparing with control - (g)	x	4,8	-
- %	x	211.6	-

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