THE DYNAMICS OF *RHAGOLETIS CERASI* POPULATIONS IN CLIMATIC CONDITIONS OF WESTERN ROMANIA

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Abstract:*This study proposed investigation the way in which weather conditions had influenced the cherries fly activity Rhagoletis cerasi, which represented the most important pest of sour cherry and bird sour cherry crops. It was known that the attack produced by that pest diminished in great measure the fruits production. Dynamics of Rhagoletis cerasi populations was investigated in sour cherry crop, in weather conditions of Dumbravita region, Timis district. To establish populations dynamics of sour cherry fly were used different types of adhesive traps. In every tree were placed adhesive traps of type RAG and SZs. Investigation concerning the establishement of populations dynamics of sour cherry fly had been realized beginning with the year 2007 to 2009, during 20-23 days. The first adults captured in year 2007 were registered in 20 th of May, in the year 2008- in 18th of May and in the year 2009- in 23th of May. In the year 2007 the most intense period of flight was registered in 06.06. characterised by a temperature of 21,7 degree C and a humidity of 65%. In the year 2008 the maximum level concerning the activity of Rhagoletis cerasi species, was touched in 07.06. characterised by a temperature of 26,1 degree C and an atmosphere humidity of 46%. In the year 2009 the most intense period of the flies was in 07.06. characterised by a temperature of 26,1 degree C and an atmosphere humidity of 46%. In the three experimental years was observed that the traps of types SZs gave the best results in monitoring Rhagoletis cerasi species. The populations dynamics of Rhagoletis cerasi in the three experimental years had presented a similar evolution with some variations, the first adults appeared between the second and third decade of May month, and afterwards will follow a decrease period, generally thanks to very low temperatures for that month of May, and followed by an increase when was also touched the maximum level.*

Key words: *Rhagoletis cerasi, dynamics, traps*

INTRODUCTION

Sour cherry could be cultivated in the plain regions, but also in hills and near the mountains, fact that it was said that species was "passenger" (POPESCU M., 1974).

On the fields strongly affected by erosion, the sour cherry especially the scrub shapes, was one of the best species concerning its increasing and fructification, contributing to soil's erosion controlling. Also, it emphasized the seeds without saltings. (TEACI D., 1976).

Taking in view the experience of others countries, in our country also it was emphasized a great part of seeds without saltings, such as the ones of Sadova's Pisc, Bechet, Dabuleni, Corabia and the others of Oltenia southerner, through plantation with seeds cheery as fructiferous or as parent stock. (***, 1965).

Another feature for that the sour cherry was a plant with great importance, it could efficiently valorize some areas, which remained technologically speaking, unused, such as causeway alignments, those of permanent ways, enclosure perimeters, the roads, among sheepfolds and some properties delimitation (MIHAIESCU GH., 1982).

Sour cherry could be used also as ornamental plant because the tree was covered with bunch of white flowers all the spring, and in time of fruits maturation appeared a very

decorative contrast among the brilliant green and red of fruits. (***, 1965).

MATERIAL AND METHODS

To establish population dynamics from the cherry's fly were used different types of adhesive traps. In every tree were placed adhesive traps of type RAG and SZs.

Investigations concerning dynamics populations establishment from cherry's fly were realized beginning with 2007 until 2009, during 20-23 days. Those ones were placed in sour cherries in the second decade of May month, with 5+7 days before the first adults' appearance. The reading of traps made to every 24 hours. The moment of traps placement established also with the help of sum model of effective temperatures, through daily summing of effective temperature degrees which exceeded the biological stage of 7 degree C (CHIRECEANU, 2008). The first captured adults in year 2007 registered in date of 20th May, in the year 2008- in date of 18th May, and in the year 2009- in date of 23th May.

RESULTS AND DISCUSSIONS

In observations years 2007-2009, the adults begun to appear between 18.05-23.05. It was followed the adults flight to advertise the controlling treatments.

It was known the fact that the attack produced by the pest diminished in a great measure the fruits production. In consequence it was necessary the knowledge of population dynamics of pest.

Table 1

The dynamics of *Rhagoletis cerasi* populations, Dumbravita, 2007

Date	Flies total	Air temperature (°C)	Atmospheric humidity (%)
20.05.2007	4	**18,0**	**80**
21.05.2007	6	**22,3**	**62**
22.05.2007	7	**20,0**	**75**
23. 05.2007	9	**21,7**	**67**
24.05.2007	10	**22,8**	**63**
25.05.2007	20	**21,6**	**72**
26.05.2007	26	**22,1**	**68**
27.05.2007	28	**23,0**	**63**
28.05.2007	26	**22,8**	**60**
29.05.2007	21	**13,2**	**62**
30.05.2007	16	**16,6**	**74**
31.05.2007	11	**16,1**	**66**
01.06.2007	6	**17,0**	**73**
02.06.2007	14	**18,7**	**71**
03.06.2007	17	**20,8**	**64**
04.06.2007	26	**22,3**	**61**
05.06.2007	47	**21,6**	**67**
06.06.2007	54	**21,7**	**65**
07.06.2007	39	**22,7**	**60**
08.06.2007	31	**22,8**	**55**
09.06.2007	25	**20,5**	**69**

From table 1 it could observe that the appearance of first flies had been in 20.05.2007.

From investigations made in year 2007 on *Rhagoletis cerasi* species it observed a constant and significant presence of this one in samples (figure 1). Thus, during the period 20.05.- 27.05. the most reduced number of species was registered in average to the beginning of the collecting period after it had registered an obvious and continual increasing until the date of 28.05., followed a decreasing period of samples number between 28.05.-01.06.2007.

Between 02.06.- 06.06. it followed a new increasing period, when it had registered also the maximum stage of that year. After that date it was observed a gradual decreasing of adults' incidence in samples.

Table 2

The dynamics of *Rhagoletis cerasi* populations, Dumbravita, 2008

Date	Flies total	Air temperature (°C)	Atmospheric humidity (%)
18.05.2008	4	**22,4**	**60**
19.05.2008	9	**22,9**	**64**
20.05.2008	15	**21,5**	**70**
21.05.2008	18	**21,4**	**66**
22.05.2008	23	**22,9**	**60**
23. 05.2008	31	**21,1**	**63**
24.05.2008	39	**18,3**	**50**
25.05.2008	36	**19,5**	**61**
26.05.2008	42	**21,6**	**54**
27.05.2008	48	**22,0**	**54**
28.05.2008	7	**15,4**	**90**
29.05.2008	5	**12,9**	**72**
30.05.2008	4	**10,5**	**85**
31.05.2008	14	**11,9**	**81**
01.06.2008	17	**13,8**	**94**
02.06.2008	21	**14,6**	**96**
03.06.2008	56	**16,6**	**84**
04.06.2008	61	**14,5**	**67**
05.06.2008	62	**16,3**	**75**
06.06.2008	75	**21,8**	**72**
07.06.2008	95	**26,1**	**46**
08.06.2008	82	**22,2**	**64**
09.06.2008	80	**24,5**	**60**
10.06.2008	65	**24,9**	**63**

From table 2 and figure 2 it could observed that in case of dynamics *Rhagoletis cerasi* populations collected in climatic conditions of Timisoara region, those ones had been registered a continual increasing on a period of 6 days, from 23-28.05., followed by a period of 3 days (29-31.05) of decreasing of species number, that because of climatic conditions very disagreeable of species development. After that period it was registered a continual and constant increasing of species number until the date of 07.06., when it had registered maximum stage for that year, after it followed a decreasing until the end of studied period.

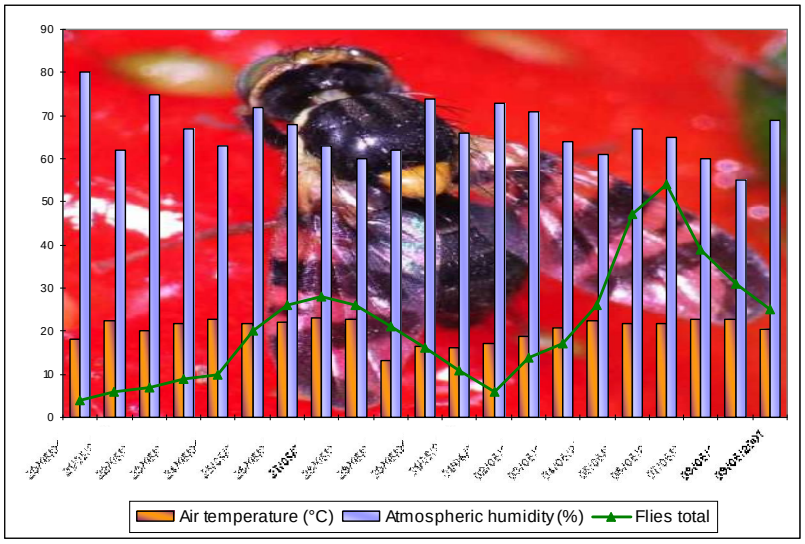


Figure 1. Evolution of *Rhagoletis cerasi* populations in the year 2007

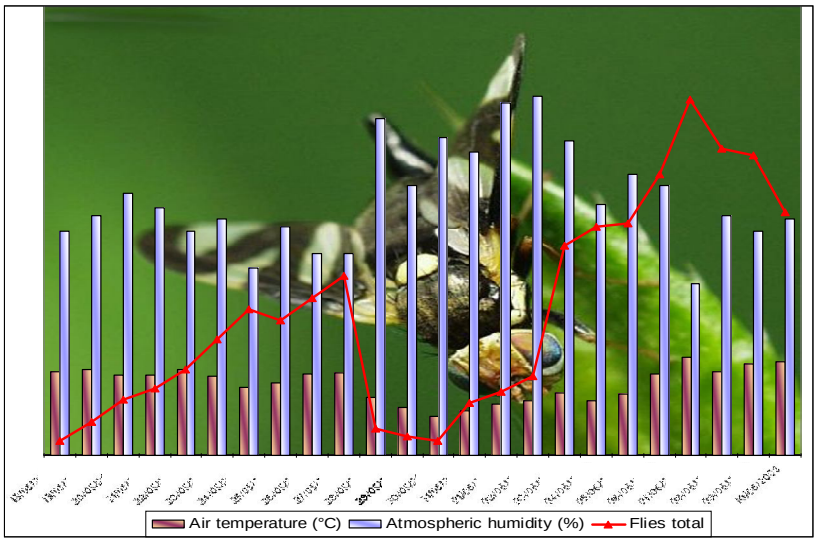


Figure 2. Evolution of *Rhagoletis cerasi* populations in the year 2008

In the same time with curve of flight making, it resulted the danger time for the orchard it was of 20-21 days, respectively from 23.05.-10.06.2009.

From table 3 we observed the period the most intense of flies' activity, it was on date of 07.06., characterized through a temperature of 26.1 degree C and an atmospheric humidity of 46%.

Table 3

The dynamics of *Rhagoletis cerasi* populations, Dumbravita, 2009

Date	Flies total	Air temperature (°C)	Atmospheric humidity (%)
23.05.2009	3	**21,1**	**63**
24.05.2009	5	**18,3**	**50**
25.05.2009	8	**19,5**	**61**
26.05.2009	14	**21,6**	**54**
27.05.2009	21	**22,0**	**54**
28.05.2009	42	**15,4**	**90**
29.05.2009	16	**12,9**	**72**
30.05.2009	12	**10,5**	**85**
31.05.2009	10	**11,9**	**81**
01.06.2009	18	**13,8**	**94**
02.06.2009	22	**14,6**	**96**
03.06.2009	30	**16,6**	**84**
04.06.2009	40	**14,5**	**67**
05.06.2009	48	**16,3**	**75**
06.06.2009	66	**21,8**	**72**
07.06.2009	89	**26,1**	**46**
08.06.2009	75	**22,2**	**64**
09.06.2009	62	**24,5**	**60**
10.06.2009	54	**24,9**	**63**

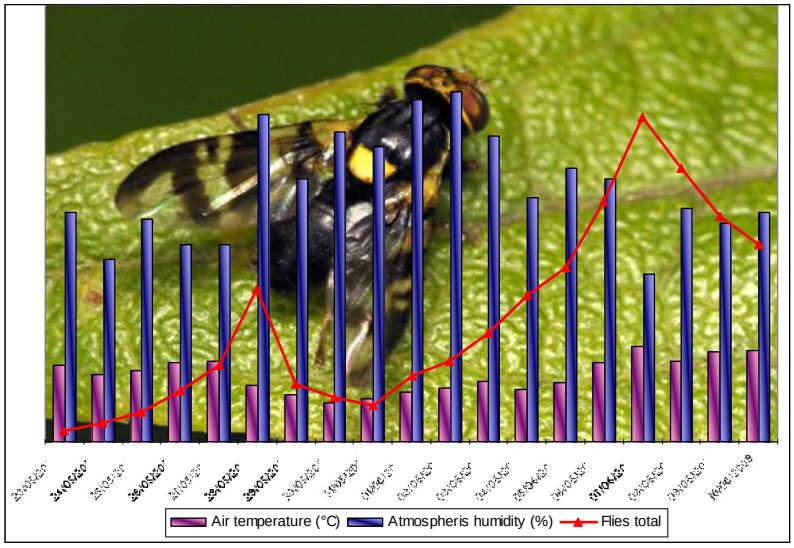
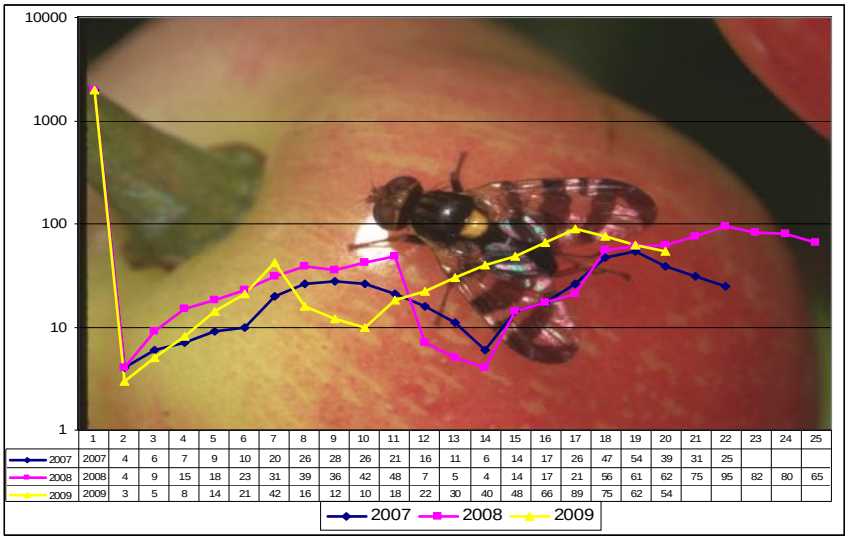


Figure 3. Evolution of *Rhagoletis cerasi* populations in the year 2009



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
2007	2007	4	6	7	9	10	20	26	28	26	21	16	11	6	14	17	26	47	54	39	31	25			
2008	2008	4	9	15	18	23	31	39	36	42	48	7	5	4	14	17	21	56	61	62	75	95	82	80	65
2009	2009	3	5	8	14	21	42	16	12	10	18	22	30	40	48	66	89	75	62	54					

Figure 4. Evolution of *Rhagoletis cerasi* populations during the period 2007-2009

From figure 3 it observed that in experimental year 2009 in sour cherry crop, the dynamics of *Rhagoletis cerasi* populations had presented as it followed: from date of 23-28 registering an increasing followed from 29-31 by a decreasing of species number, and from 01-07 it would increase until the maximum stage for that year, followed in the end of investigations by a decreasing.

From the analysis of dynamics populations of *Rhagoletis cerasi* in the three experimental years it concluded that its evolution however presented some variations, the first adults appear between the second and third decade of May month, followed by an increasing, when the maximum stage was touched, which for all the three experimental years was in first decade of June month, also followed by a new decreasing signaled until the end of investigated period, the last captures making until the third decade of June month (figure 4).

CONCLUSIONS

- In the year 2007, the dynamics populations of cherries' flies presented an increasing until the third decade of May, followed by a decreasing and a new increasing in the first decade of June
- In case of dynamics populations of *Rhagoletis cerasi* collected in the year 2008, those ones presented an increasing until the third decade of May month, followed by a decreasing and a new increasing in the first decade of June
- In experimental year 2009, in sour cherry crop, the dynamics of populations *Rhagoletis cerasi* registered increases, until the third decade of May month when followed a period of some decreases, and afterwards a new increasing in the first decade of June
- In the three experimental years it determined that the traps of type SZs gave the best results in monitoring *Rhagoletis cerasi* species
- The dynamics of *Rhagoletis cerasi* populations in the three experimental years presented a similar evolution with some variations, the first adults appeared between the

second and third decade of May month, it was followed a decreasing period, generally thanks to very low temperatures for that month of May, when also the maximum stage had been touched.

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