MEAN DAILY CAPTURES OF WCR PER TRAP DURING THE MAIZE VEGETATION PERIOD IN WESTERN PART OF ROMANIA

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Abstract: *Recently, the chrysomelid Diabrotica virgifera virgifera Le Conte became a serious pest in European maize cultures. Having in mind the first appearance of species in Romania (Nadlac, Arad) we tried to make know the present situation of this invasive species, especially in west part of country. For the first time, in Romania are mentioned the comparative studies between different localities. During 2009, as well as during previous year, the monitoring of Diabrotica virgifera virgifera (WCR) was done continuing the implementation of a usual protocol. For establish of adults number were used Hungarian pheromone traps (Csalomon ® Diabrotica v.v. tip panou/2). The traps were installed from June to September, in three repetitions (T1, T2, T3/location). The frequency of Diabrotica virgifera virgifera Le Conte adults was based on readings directly in fields, in 22 localities from 10 counties (Timiş, Arad, Hunedoara, Bihor, Cluj, Satu Mare, Sălaj, Caraş Severin, Alba, Mureş) situated in western part of Romania. For installing of traps we used the common methods and for finding the location the GPS was used. The researches were made in conventionally maize, untreated against target pest. Generally, in Romania, especially in west part, western corn rootworm spreads rapidly and soon we expect it to be present in the most important growing areas. The pest has spread to all direction. So, this is explanation of the frequency of adults in all location with installed traps. The highest level of captures were registered in Arad and Timis counties (over 14000 beetles/traps1,2,3/locality). The first point of appearance in our country was Nadlac from Arad county, and the highest no. of adults were registered in Simand, a neighboring location of Nadlac (21323 beetles/traps 1,2,3). We acknowledge a technical support of all farmers from different localities who have provided us the maize fields. The Ministery Education financed this work within the framework of PN-II-ID-PCE-2007-1/RO project.*

Key words**:** *Diabrotica virgifera virgifera Le Conte, adult, mean daily captures, maize.*

INTRODUCTION

Diabrotica virgifera virgifera Le Conte knows as WCR (Western corn rootworm) is a very serious pest in maize fields from Americas and Europe. Ever since the western corn rootworm (WCR) an alien invasive species from North America, has been introduced into Europe on at least 3 separate occasions, it spread within 15 years over the entire area of south-eastern and central Europe (except Denmark) (ULRICH et al., 2008).

In 1996 the *WCR* adults was detected in Romania, too for the first time. In 1997 was very frequent along the border with Yugoslavia, but it also registered in the area near to Hungary. In 1998 the pests spread from West to East, within almost the whole Timis District. The *Diabrotica* populations have increased strongly year by year up to 2001 (HANCU et al, 2003). For monitoring the best results with FAO sex pheromone were obtained. In 2000 the first areas with larval attack in a maize field of the Jimbolia zone was found. In this year the attack is stronger than before (GROZEA et al. 2006, 2007, 2009; PALAGESIU et al., 2001). For monitoring of the adults were used Hungarian pheromone traps (type of Csalomon ® Diabrotica v.v. tip panou/2). The traps were installed from June to September. The frequency of *Diabrotica virgifera virgifera* Le Conte adults was manifold, based on location and ecological conditions (CRISAN et al, 2009).

MATERIAL AND METHODS

Beginning to 1997, the observations regarding the presence of the pest *Diabrotica virgifera virgifera* are made in generally in western part of Romania. We chose this part of country because the presence of the pest *Diabrotica virgifera virgifera* in great number.

For establish the number of adults we made observations in 17 places (localities) from western part of Romania. In 2009 the research location were: Timişoara, Gataia, Simand, Covasant, Chelmac, Soimi, Gura Vaii, Gurasada, Nusfalau, Varfurile, Prisaca, Resita, Teregova, Domasnea, Negreni and Valisoara), from plain (110 m) to mountain (557 m). For each studied place we have installed three pheromone traps (type of Csalomon®). The traps were placed in middle part of the filed, to a distance of 50 or 100 m, beginning to end of June. Their replacements were made each two weeks, depending on weather conditions, between months June until September. The adults were monitored daily.

For movement we used the car of Entomology and Agricultural Zoology department and for determination of altitude we used a GPS apparatus.

RESULTS AND DISCUSSIONS

In this scientific work based on national project we try to make known the presence of WCR pest in maize crops from all western part of Romania and from plain to mountain conditions. Having in mind the results obtained in period of 1996-2005 at national level through data provided by our specialists and the last data from 2006-2009 period (data provided by authors of this paper) we can say that this invasive species become more and more important from Romania. It was our goal to establish current level of adults' population.

Regarding the number of captures on traps/locations we founded that them are frequent to all locations studied, in different level, from 1148 beetles (Domasnea locality, mountain zone) to 21323 beetles (Simand locality, Arad County, plain zone) (table 1) .

In *Z. mays*, during June 6 to September 9, 2009, we detected observed a highest level of beetles captures in period of the end of July - beginning of August (figures 1-17). In July and August the air temperature was preserved to constant values, but high value, so this aspect caused increasing of no. of adults. The presence of rainfalls (25 mm) caused decreasing of temperature and indirectly has decrease the no. of ad./trap. In generally the level of rainfalls was missing.

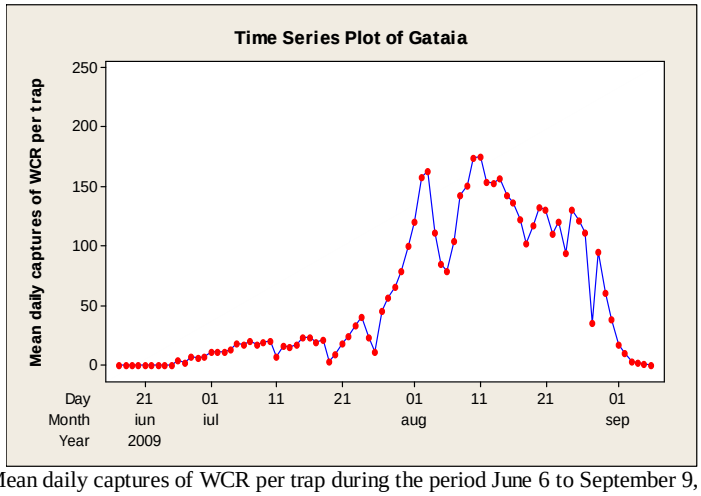

Figure 1: Mean daily captures of WCR per trap during the period June 6 to September 9, 2009 in the maize field in *Gataia*, West Romania

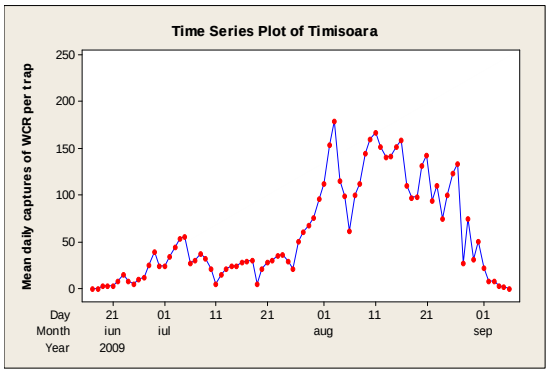

Figure 2: Mean daily captures of WCR per trap during the period June 6 to September 9, 2009 in the maize field in *Timisoara*, West Romania

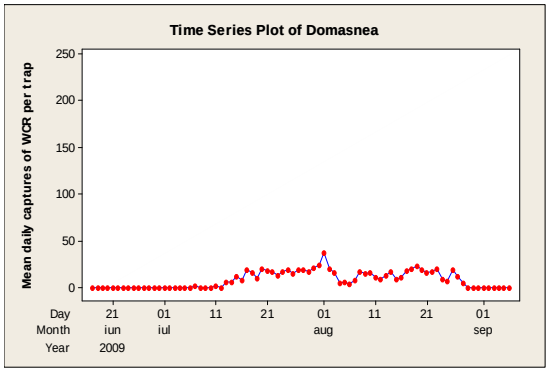

Figure 3: Mean daily captures of WCR per trap during the period June 6 to September 9, 2009 in the maize field in *Domasnea*, West Romania

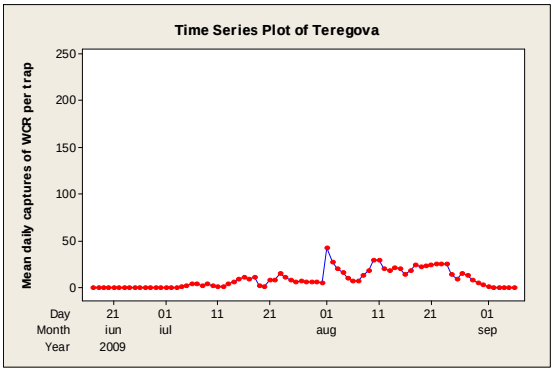

Figure 4: Mean daily captures of WCR per trap during the period June 6 to September 9, 2009 in the maize field in *Teregova*, West Romania

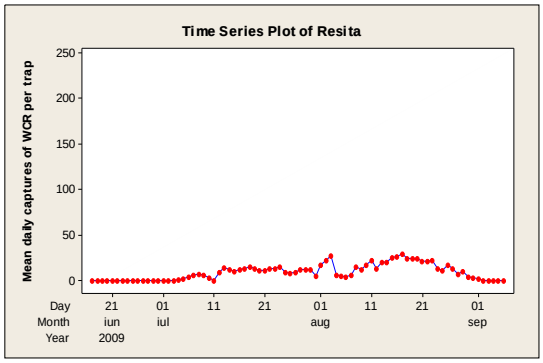

Figure 4: Mean daily captures of WCR per trap during the period June 6 to September 9, 2009 in the maize field in *Resita*, West Romania

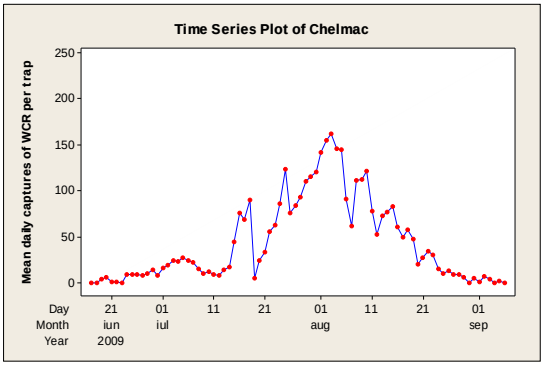

Figure 5: Mean daily captures of WCR per trap during the period June 6 to September 9, 2009 in the maize field in *Chelmac*, West Romania

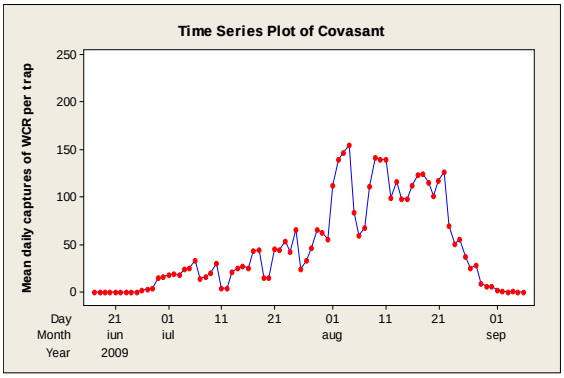

Figure 6: Mean daily captures of WCR per trap during the period June 6 to September 9, 2009 in the maize field in *Covasant*, West Romania

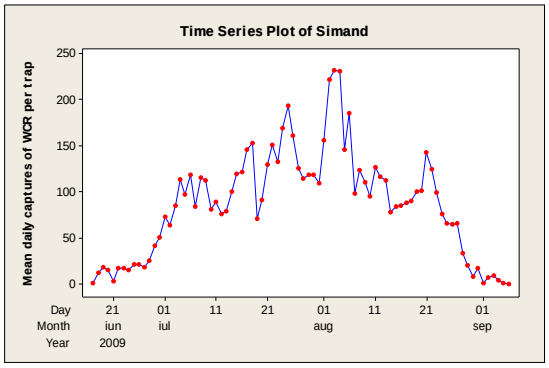

Figure 7: Mean daily captures of WCR per trap during the period June 6 to September 9, 2009 in the maize field in *Simand*, West Romania

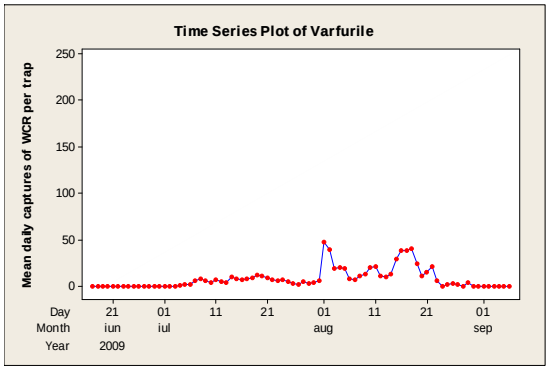

Figure 8: Mean daily captures of WCR per trap during the period June 6 to September 9, 2009 in the maize field in *Varfurile*, West Romania

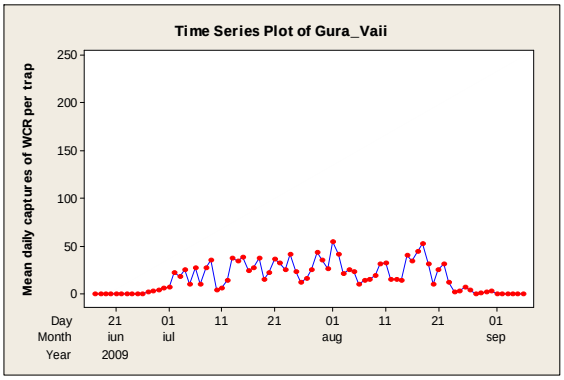

Figure 9: Mean daily captures of WCR per trap during the period June 6 to September 9, 2009 in the maize field in *Gura Vaii*, West Romania

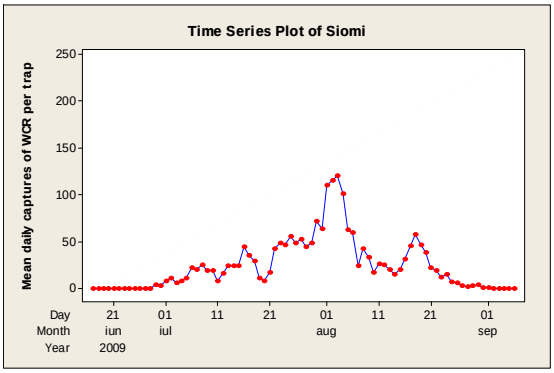

Figure 10: Mean daily captures of WCR per trap during the period June 6 to September 9, 2009 in the maize field in *Soimi*, West Romania

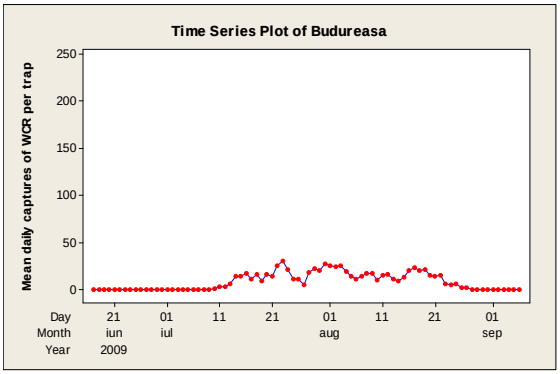

Figure 11: Mean daily captures of WCR per trap during the period June 6 to September 9, 2009 in the maize field in *Budureasa*, West Romania

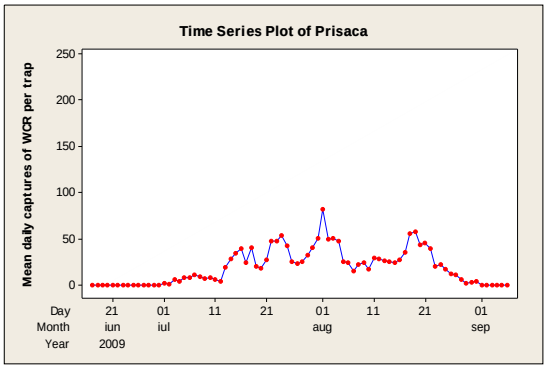

Figure 12: Mean daily captures of WCR per trap during the period June 6 to September 9, 2009 in the maize field in *Prisaca*, West Romania

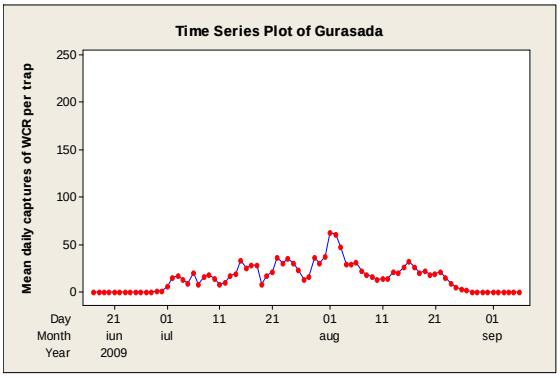

Figure 13: Mean daily captures of WCR per trap during the period June 6 to September 9, 2009 in the maize field in *Gurasada*, West Romania

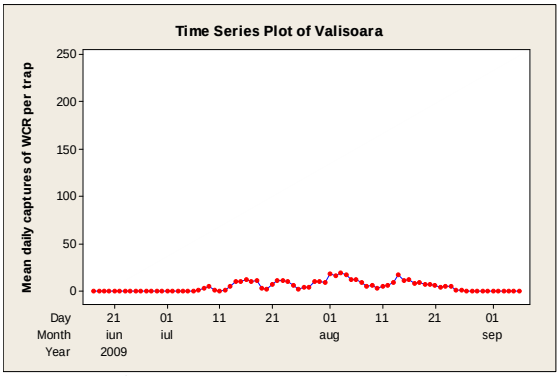

Figure 14: Mean daily captures of WCR per trap during the period June 6 to September 9, 2009 in the maize field in *Valisoara*, West Romania

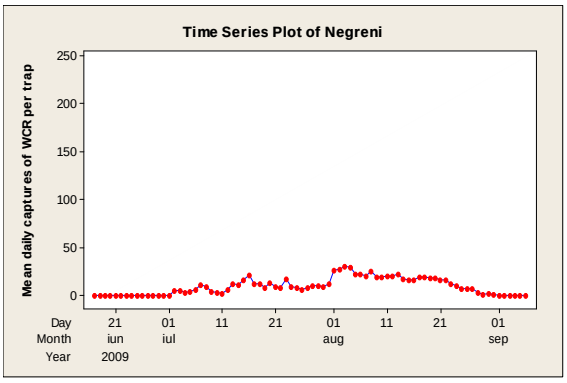

Figure 15: Mean daily captures of WCR per trap during the period June 6 to September 9, 2009 in the maize field in *Negreni*, West Romania

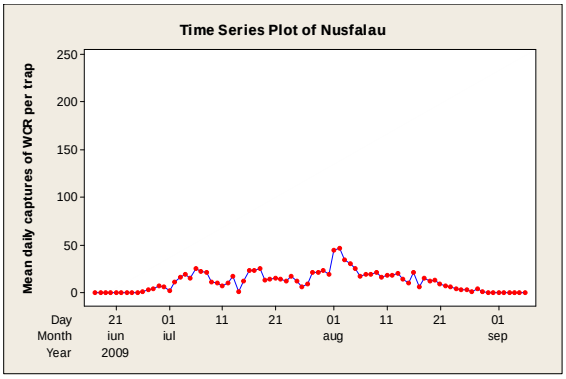

Figure 16: Mean daily captures of WCR per trap during the period June 6 to September 9, 2009 in the maize field in *Nusfalau*, West Romania

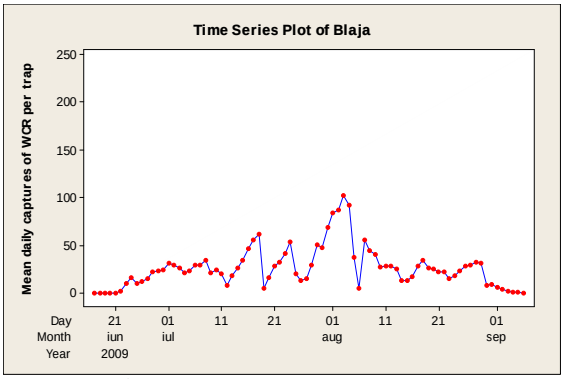

Figure 17: Mean daily captures of WCR per trap during the period June 6 to September 9, 2009 in the maize field in *Blaja*, West Romania

CONCLUSIONS

In Romania, especially in west part, western corn rootworm spreads rapidly and soon we expect it to be present in the most important growing areas.

The pest has spread to all direction. So, this is explanation of the frequency of adults in all location with installed traps.

The highest level of captures was registered in period of the end of July - beginning of August, in plain and mountain zones, too.

The first point of appearance in our country was Nadlac from Arad County, and the highest no. of adults was registered in Simand, a neighboring location of Nadlac (21323 beetles/all traps/place).

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Table 1

The total number of captures to different locations

Locality	Altitude	Captures (total number)
Timisoara	110	14582
Gătaia	115	18462
Chelmac	116	10861
Covăsânț	134	11585
Şimand	140	21323
Şoimi	145	6118
Gura Văii	164	4288
Gurasada	183	3840
Nusfalau	214	2887
Vîrfurile	228	2042
Prisaca	270	4867
Reşiţa	323	2327
Negreni	388	2400
Teregova	396	2242
Budureasa	403	2156
Valisoara	447	1213
Domaşnea	557	1148

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