MONITORING OF THRIPS ATTACK IN THE SEEDLING STAGE OF PLANTS WITH MULTIPLE USES

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INTRODUCTION

Thrips are one of the most difficult pests to control in seedling stage (Maria Calin, 2004, 2005). This pest is very dangerous insects that reproduce rapidly, congregate in tight places that make pesticide coverage difficult. After the insect feed, the results are the deformation of flowers and leaves (Maria Călin, 2004, 2005, Dreistadt and all., 2001, 2004, 2007).The tolerance of thrips on plants with multiple uses crops is low.

In addition, when *Thrips tabaci* feed on plants they usually infect the plant with the viruses as: *Lycopersicon virus* 3, *Solanum virus* 8, *Nicotiana virus* 1, *Tomato Spotted wilt virus*. Once plants are infected, it is too late to do anything except dispose of diseased plants. Thus, the best way to prevent virus infection is to control the thrips (Flint and all., 1998, Maria Călin, 2005).A regular monitoring program is the basis of all pest management programs. The best way is to conduct a regular, weekly monitoring program to detect problems in an early stage.

This early detection and treatment will result in better pest control since plant canopies are smaller and better spray coverage can be achieved. Plant inspection is needed to assess general plant health and to detect the pests (O´Donnell et all, 2005; Maria Călin, 2005).

MATERIALS AND METHODS

During 2007 - 2008, greenhouse experiments were performed in Vegetable Research-Development Station Bacau - Romania, in order to evaluate the plant with multiple uses tolerance to attack of thrips in the seedling stage (Table 1). The species were seeded in the greenhouse on February and March. After emergence, in about 3 – 10 days the young plants were transplanted in 104 - cell plastic trays.

No preventive chemicals treatments were applied in order to encourage the development of the pest attack.

For monitoring the attack we randomly selected plants at four locations, each with 100 seedlings and we examined plants. Examine the underside of leaves for insect pests and inspect root systems to determine whether they are healthy (Calin Maria, 2004, 2005). The observations were accomplished at each 10 days during a period of 40 - 50 days after transplanting the young vegetable plants in plastic trays.

The attack was estimated using the following indicators:

- Frequency of attack (F%),
- Intensity of attack (I%),
- Degree of attack (DA%).

The obtained results will be used in plant breeding in order to decrease the number of pest's chemicals treatment in the seedling technologies of plants with multiple uses.

The plants of multiple uses lines and varieties susceptibility to attack of the thrips was as it follows (table 2).

RESULTS AND DISCUSSIONS

The data obtained, shows the different response of plants with multiple uses species to thrips attack.

It was identified the symptom of attack in:

- *Agastache foeniculum* (F% - 4.0%) and A. mexicana in stage of 6 leaves (table 1 and diagram 1);
- *Salvia splendens* F% - 4,7, S. coccinea F% - 2.0, S. coccinea – F% - 2,0 (Diagram 2);
- *Nasturtium officinale* F% - 5,9,
- *Tagetes tenuifolia* F% - 25,9, T. patula nana F% - 8,3,
- *Ocimum basilicum,* Vert F% - 13,1, *O. basilicum* var.l*emon* F% - 9,5;
- *Callistephus chinensis* Douchesse alb F% - 4,8, *Anthirinium majus* F% - 4,0, *Lobelia erinum* F% - 8,7

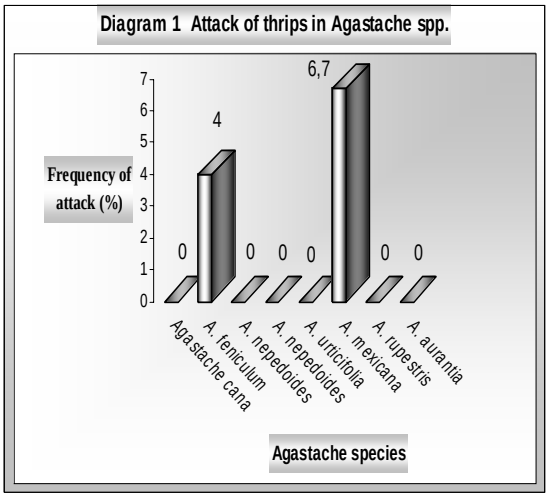
Intensity of attack (I%) was below 5.4%.

The degree of attack was below 0.4 % under Economical Treshold Level, but we applied the chemical treatments two times, with Confidor 0,075% and Mospilan 0,03 %.The treatments were applied

because the thrips transmit *Lycopersicon virus* 3, *Solanum virus* 8, *Nicotiana virus* 1, *Tomato Spotted wilt virus*. In addition, if the treatments for controlling the thrips, are not applied the populations increase very quickly and the pests are very difficult to control. The characteristic for this specie is parthenogenesis multiplication. One female insert 80 - 100 eggs in soft plant tissue. If the treatments for the control of pests are not applied, the populations of pests grow very quickly.

Table 1. Study of flower and the plant with multiple uses in seedling stage

No.	Varieties/lines	Time			Comments
		Sowing	Raising of plants	Transplant of plants in plastic trays	
1	*Agastache foeniculum*	13.03	23.03	26.03	Normally come up of plants
2	*Agastache nepedoides*	13.03	19.03	03.04	Normally come up of plants
3	*Agastache hybrida*	13.03	18.03	31.03	Normally come up of plants
4	*Agastache urticifolia*	13.03	17.03	29.03	Come up of plants in 4 days
5	*Agastache mexicana*	13.03	17.03	26.03	Come up of plants in 4 days
6	*Agastache rupestris*	13.03	18.03	27.03	Come up of plants in 5 days
7	*Agastache aurantia*	13.03	18.03	27.03	Come up of plants in 5 days
8	*Agastache cana*	14.03	19.03	24.03	Come up of plants in 5 days
9	*Petunia hybrida* var. *pendula*	29.02	07.03	12.03	Normally come up of plants
10	*Salvia splendens*	29.02	07.03	12.03	Normally come up of plants
11	*Salvia coccinea*	2/19.03	23.03	02.04	Come up of plants in 4 days
12	*Salvia coccinea*	18.03	23.03	02.04	Come up of plants in 5 days
13	*Salvia officinalis*	13.03	23.03	26.03	Normally come up of plants
14	*Salvia sclarea*	13.03	17.03	27.03	Come up of plants in 4 days
15	Salvia ringens	11.03	20.03	24.03	Normally come up of plants
16	*Nasturtium officinale*	11.03	16.03	28.03	Come up of plants in 5 days
17	Tagetes tenuifolia	06.03	10.03	13.03	Come up of plants in 4 days
18	*Tagetes patula* var. *nana*	05.03	08.03	19.03	Normally come up of plants
19	*Ocimum basilicum* Vert	05.03	08.03	19.03	Come up of plants in 3 days
20	*Ocimum basilicum* var. *lemon*	05.03	09.03	19.03	Come up of plants in 4days
21	*Ocimum basilicum* var. *bulatum*	20.03	27.03	07.04	Normally come up of plants
22	*Ocimum basilicum* red	21.03	01.04	07.04	Normally come up of plants
23	*Ocimum basilicum* curly	27.03	30.03	07.04	Come up of plants in 3 days
24	*Pelargonium peltatum* young plants	x	x	10.03	Normally grow
25	*Pelargonium zonale seedlings*	09.03	20.03	25.03	Normally come up of plants
26	*Calamintha gland secret*	13.03	19.03	27.03	Normally come up of plants
27	*Zinia elegans*	24.03	27.03	02.04	Come up of plants in 3 days
28	*Zinia angustifolia*	24.03	01.04	08.04	Normally come up of plants
29	*Callistephus chinens*is Douchesse alb	20.03	23.03	02.04	Come up of plants in 3 days
30	*Calistephus chinensis* Lady coral	20.03	25.03	07.04	Come up of plants in 5 ays
31	*Calistephus chinensis* Sea Starlet	20.03	01.04	08.04	Normally come up of plants
32	*Callistephus chinensis* Little red	24.03	31.03	02.04	Normally come up of plants
33	*Antirhinium majus*	06.03	12.03	20.03	Come up of plants in 6days
34	*Lobelia erinus*	06.03	14.03	02.04	Normally come up of plants
35	*Gazania splendens*	06.03	12.03	20.03	Come up of plants in 6 days
36	*Dahlia variabilis*	27.03	01.04	07.04	Come up of plants in 4 days



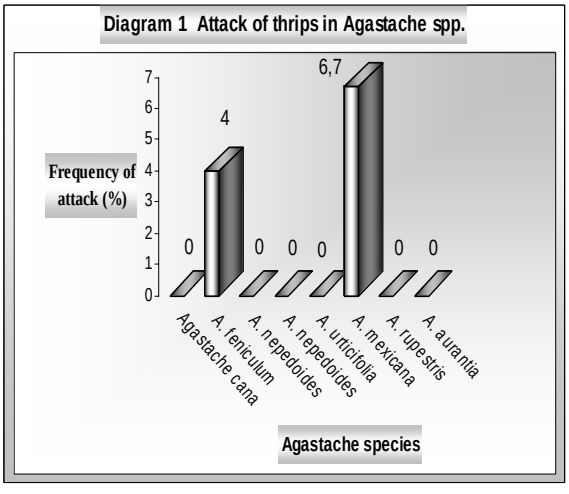


Table 2. The degree attack of thrips in vegetable seedling

No. var.	Varieties/Lines	Attack			Comments
		Frequency (%)	Intensity (%)	Degree of attack (%)	
1	*Agastache foeniculum*	4,0	4,2	0,2	6 leaves
2	*Agastache nepedoides*	0	0	0	
3	*Agastache hybrida*	0	0	0	
4	*Agastache urticifolia*	0	0	0	
5	*Agastache mexicana*	6,7	5,4	0,4	6 leaves
6	*Agastache rupestris*	0	0	0	
7	*Agastache aurantia*	0	0	0	
8	*Agastache cana*	0	0	0	
9	*Petunia hybrida* var. *pendula*	7,1	5,4	0,4	10 leaves
10	*Salvia splendens*	4,7	6,3	0,3	11 leaves
11	*Salvia coccinea*	2.0	2.1	0.1	
12	*Salvia coccinea*	2,0	1,0	0.1	3 leaves
13	*Salvia officinalis*	0	0	0	
14	*Salvia sclarea*	0	0	0	
15	Salvia ringens	0	0	0	
16	*Nasturtium officinale*	5,9	4,5	0,3	9 leaves
17	Tagetes tenuifolia	25,9	4,9	1,3	11 leaves
18	*Tagetes patula* var. *nana*	8,3	2,7	0,3	9 leaves
19	*Ocimum basilicum* Vert	13,1	3,4	0,4	10 leaves
20	*Ocimum basilicum* var. *lemon*	9,5	4,1	0,4	9 leaves
21	*Ocimum basilicum* var. *bulatum*	0	0	0	
22	*Ocimum basilicum* red	0	0	0	
23	*Ocimum basilicum* curly	0	0	0	
24	*Pelargonium peltatum* young plants	0	0	0	10 leaves
25	*Pelargonium zonale seedlings*	8,6	3,1	0,3	5 leaves
26	*Calamintha gland secret*	1,2	1,1	0,1	6 leaves
27	*Zinia elegans*	0	0	0	2 leaves
28	*Zinia angustifolia*	0	0	0	
29	*Callistephus chinens*is Douchesse alb	4,8	2,2	0,1	5 leaves
30	*Calistephus chinensis* Lady coral	0	0	0	
31	*Calistephus chinensis* Sea Starlet	0	0	0	
32	*Callistephus chinensis* Little red	0	0	0	
33	*Antirhinium majus*	4,0	2,5	0,1	5 leaves
34	*Lobelia erinus*	8,7	4,2	0,4	3 leaves
35	*Gazania splendens*	0	0	0	7 leaves
36	*Dahlia variabilis*	0	0	0	7 leaves

CONCLUSIONS

During 2007 - 2008, greenhouse experiments were performed in Vegetable Research-Development Station Bacau - Romania, in order to evaluate the plants with multiple uses to attack of the thrips in seedling stage of the following: *Agastache foeniculum, Agastache nepedoides, Agastache hybrida, Agastache urticifolia, Agastache mexicana, Agastache rupestris, Agastache aurantia, Agastache cana, Petunia hybrida* var. *Pendula, Salvia splendens , Salvia coccinea, Salvia coccinea, Salvia officinalis, Salvia sclarea.*

Salvia ringens, *Nasturtium officinale*, Tagetes tenuifolia, *Tagetes patula* var. *Nana*, *Ocimum basilicum* Vert, *Ocimum basilicum* var. *Lemon, Ocimum basilicum* var. *Bulatum*, *Ocimum basilicum* red, *Ocimum basilicum* curly, *Pelargonium peltatum* young plants, *Pelargonium zonale seedlings*, *Calamintha gland secret*, *Zinia elegans*, *Zinia angustifolia*, *Callistephus chinens*is Douchesse alb, *Calistephus chinensis* Lady coral, *Calistephus chinensis* Sea Starlet, *Callistephus chinensis* Little red, *Antirhinium majus*, *Lobelia erinus*, *Gazania splendens*, *Dahlia variabilis.*

It was identified the attack symptoms in: - *Agastache foeniculum* (F% - 4.0%) and A. mexicana in stage of 6 leaves; *Salvia splendens* F% - 4,7, S. coccinea F% - 2.0, S. coccinea – F% - 2,0; *Nasturtium officinale* F% - 5,9; *Tagetes tenuifolia* F% - 25,9, T. patula nana F% - 8,3, *Ocimum basilicum,* Vert F% - 13,1, *O. basilicum* var.l*emon* F% - 9,5; *Callistephus chinensis* Douchesse alb F% - 4,8, *Anthirinium majus* F% - 4,0, *Lobelia erinum* F% - 8,7.

Intensity of attack (I%) was below 5.4%.

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ABSTRACT

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urticifolia, Agastache mexicana, Agastache rupestris, Agastache aurantia, Agastache cana, Petunia hybrida var. *Pendula, Salvia splendens , Salvia coccinea, Salvia coccinea, Salvia officinalis, Salvia sclarea.*

For monitoring the attack we randomly selected plants at four locations, each with 100 seedlings and we examined plants. Examine the underside of leaves for insect pests and inspect root systems to determine whether they are healthy (Calin Maria, 2004, 2005). The observations were accomplished at each 10 days during a period of 40 - 50 days after transplanting the young vegetable plants in plastic trays.

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