

DAMAGES AND LOSSES MADE BY *ACYRTHOSIPHON PISUM* HARR. IN GREEN PEA CROP

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Abstract

Acyrtosiphon pisum Harr. is a cosmopolite species and is found all around the world.

The aphid develops its life on green pea, lucerne, clover, *Vicia sativa* L. *Vicia faba* L. *Lens culinaris*, sweet wood, being encountered almost entirely on vegetables.

The main plants struck by the green pea louse, according to our research, are shown.

As it is seen on the 9 types of plants which were struck by this aphid, the most common ones are the in the green pea family (*Pisum* spp.). Rarely the aphid has struck species like *Medicago* spp. and *Trifolium* spp. On *Vicia sativa* L. the attack's frequency was low and without a pattern.

As it can be seen in the same chart, vegetables are the basic and only plants the aphid feeds on. From these vegetables, the green pea, as well as the garden soils, which derive and come from the field pea and it is closely related to fodder pea (*Pisum arvense*), originating from Asia and from regions near the Mediterranean Sea, represent the main host plants.

During the research which carried out in different countries, it was proved that the green pea aphid's (*Acyrtosiphon pisum* Harr.) affinities differ from one soil to another. This state is actually debt to the different biochemical structure of the vegetable's parts which were damaged (flowers, leaves, stalks).

INTRODUCTION

On green pea, as a result of the intense pea leaf louse attack, the crop production can be significantly smaller, the losses varying between 20 - 80%.

The damages caused by the aphids are direct, because the plants are drained of sap, and the vegetal tissue is altered and the aphid's saliva is toxic for the plants. Usually, along with the attack, there is also a sugared secretion called "honey dew", on which, later on, different bacteria can appear.

The pest brings important damages also through its role of transmitting viruses to the green pea (in the pea's nervous system - *Pisum virus 1*; in its whole internal structure - *Pisum virus 2*; leaf twisting - *Pisum virus 8*; the colour is a little changed - *Pisum virus 9*).

MATERIAL AND METHODS

The attack degree depends on the climatic conditions from that specific year, but also on the green pea soil's sensitivity.

On green pea, *Acyrtosiphon pisum* Harr. causes attacks which have an annual frequency forming crowded colonies on stalks, offshoots, leaves, flowers and young pods. The larvae, as well as the adults like to live especially on the upper side of the plant, especially on the young pods, and they suck the sap from the tissues. The aphids influence the normal growth and development of the plants. The more intense the attack is, the lower and poorer the yield is.

As a result of the aphid's attack, the leaves begin to fade and become yellow and then they wither up. The buds don't open anymore, the flowers cannot produce new buds anymore, thus the pods production is smaller.

RESULTS AND DISCUSSION

During 3 years of study (2000, 2001, 2002), we wanted to see the numerical abundance of *Acyrtosiphon pisum* Harr. on each of the plant's upper parts (stalks, leaves, and pods).

From Table 1 analysis we can see that the young pods were the most populated (figure 1). The aphid's powerful attack is the most important factor because it decreases the peas production and at the same time the best time to use chemical treatments against the aphid.

Table 1

Damages made on the upper parts of green pea, by aphid (*Acyrtosiphon pisum* Harris, *Aphididae* – *Homoptera*) at USAMVBucharest, between 2000 – 2002

Year	Leaf louse									
	Total number of aphids		Out of which:							
	No.	%	Stalks		Leaves		Flowers		Pods	
			No.	%	No.	%	No.	%	No.	%
2000	180	100	4	2.2	11	6.1	117	65.0	48	26.7
2001	198	100	5	6.3	5	6.3	131	66.2	57	21.2
2002	220	100	9	4.1	27	12.3	142	64.5	42	19.1



Fig. 1. Aphid attack on green pea at USAMV Bucharest (original)

On the field, the aphid generates large attacks, especially in the warm years with some rain-showers. The numerical density reaches maximum worths in June and July.

In 2000 - 2002 the flowers' infection degree with aphids in comparison with the plant's other organs was of 64.5-66.2%.

From our research carried out during the 3 years of study, we noticed that the production losses (%), according to the witness (without any treatments), were of 9.1%, at an attack degree of 61.2% in 2000, of 17.7% at an attack degree of 92.0% in 2001 and of 21.3% at an attack degree of 100% in 2002 (table 2). The information we gained confirm other author's results, which insist that during the years with few light rain, the damages made by the green pea aphid can rise up to 10-20%.

Table 2

**Yields losses on green pea crops due to the green pea aphid attack
(*Acyrtosiphon pisum* Harris, *Aphididae* - *Homoptera*)
at USAMV Bucharest, in years 2000 – 2002**

Year	Number of aphids on:				Attack frequency (%)	Attack Intensity (%)	Attack degree (%)	Yield losses (%) without any treatments
	Leaves	Stalks	Flowers	Growing pods				
2000	18	2	124	42	90	68	61.2	9.1
2001	27	7	162	61	100	92	92.0	17.7
2002	32	11	180	53	100	100	100.0	21.3

CONCLUSIONS

1. The research was carried out in the experimental field of USAMV Bucharest.
2. The attack degree depends on climatic conditions, from that specific year but also on the sensitivity of the type of pea which is present in the crop.
3. From the research carried out during the 3 study years, it's shown that the production losses, related to the untreated plants, were of 9.1% at an attack degree of 61.2% in 2000, of 17.7% at an attack degree of 92.0% in 2001 and of 21.3% at an attack degree of 100% in 2002.

REFERENCES

1. Coutin R., 1998. *Pea aphid green pea louse Acyrthosiphon pisum*. Harris (pp. 112-119).
2. Markkula Martti, Roukka Kaisa, 1970. *Resistance of plants to the pea aphid Acyrthosiphon pisum Harr. (Homoptera, Aphididae) II. Fecundity on different red clover varieties*. Ann. Agric. Fenniae. Vol. 9, Tikkurila - Finlanda (pp. 304 - 308).
3. Walden B.H., 1926. *Outbreak of pea aphid on alfalfa*. Conn. Agric. Exp. Sta. Bull. 275 (pp. 295 - 298).
4. Wilcoxson R.D., A.G. Peterson, 1960. *Resistance of Dollard red clover to the pea aphid, Macrosiphum pisi*. J. Econ. Ent. 53 (pp. 863 - 865).