

## A STUDY ON THE ATTACK ON WHEAT, MAIZE, AND SUNFLOWER BY SOME PESTS IN THE MAIN WAREHOUSES IN THE COUNTY OF TIMIS

### STUDIUL PRIVIND ATACUL UNOR DĂUNĂTORI AGRICOLI LA GRÂU, PORUMB SI FLOAREA SOARELUI ÎN PRINCIPALELE DEPOZITE DIN JUDEȚUL TIMIȘ

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**Rezumat:** *Atacul principalilor dăunători de depozit, intensitatea atacului, numărul de generații, etc. depind de condițiile de temperatură și umiditate precum și tratamentele făcute în depozit. Fiecare tip de magazie sau depozit asigură mai bine sau mai puțin bine condițiile optime pentru păstrare. S-a observat că silozurile moderne sunt singurele care pot da rezultate foarte bune în ceea ce privește păstrarea corespunzătoare a semințelor. Controlul depozitelor trebuie efectuat sistematic. În lucrare sunt prezentate date cu privire la infestarea cu specii dăunătoare depistate în 13 depozite din jud. Timiș. În urma analizelor de laborator au fost identificați următorii dăunători: Tribolium confusum, Sitophilus granarius, Sitotroga cerealella și Mus musculus, cu o evaluare a atacului de la slab la puternic atacat.*

**Abstract:** *The attack by the main warehouse pests, attack intensity, the number of generations, etc., depend on the temperature and moisture conditions as well as on the treatments applied in the warehouse. Each type of barn or warehouse ensures more or less optimal conditions for preservation. We noticed that modern silos are the only ones that can give good results from the point of view of proper seed preservation. Warehouse control should be done on a systematic basis. In this paper we present data concerning the infestation with pest species found in 13 warehouses in the County of Timis. As a result of laboratory analyses we identified the following pests: Tribolium confusum, Sitophilus granaries, Sitotroga cerealella, and Mus musculus, with weak to strong attacks.*

**Key words:** *warehouse, pest, infestation, assessment*  
**Cuvinte cheie:** *depozit, dăunător, infestare, evaluare*

#### INTRODUCTION

The issue of quality and of the improvement of agricultural produce quality is of greater concern for the whole world, a reason for which we should pay more attention to this index that reflects directly and indirectly in economic results of agricultural exploitations.

Agricultural produce quality depends on a large number of predictable factors such as: cultivar, cultivation technology, climate, etc.

Storing and preserving plant agricultural produce should be done in accordance with specific standards. In warehouses, barns, etc., there is a specific damaging fauna. The main factors of pest development are: temperature, moisture, and food. Development duration variation of these pests is under the influence of these factors.

Insects are one of the main causes of the losses in cereals and seeds stored, as well as in other stored alimentary produce. Not only they eat these produce, but they also contaminate them with insect fragments, excrements, membranes, foul-smelling metabolic produce, as well as with a varied micro-flora, constituting a major problem that interests health and quality control.

## MATERIAL AND METHOD

In order to establish the presence of pests in the warehouses we controlled, as well as in order to measure infestation degree, seeds are analysed from each lot and kept.

We took the average sample that characterises the phyto-sanitary state of the seed lot. Seed sampling was done with a barn probe (for the bulk) or with a sack probe for sacked seeds.

In order to analyse seed infestation, we took at least 1 kg of seeds, depending on the amount of the seeds in the lot.

Average samples were analysed no longer than 2 days after the samples were taken.

Analysis sample contains a pre-established amount of seeds according to analysis method standards.

In order to separate mites and insects, the seed sample is sieved through a series of sieves with different hole sizes, depending on the seed and pest size.

The problem with this method is that sieving does not completely separate mites and insects within the seeds. This is why we also use the thermal method and a thermo-electrode.

In order to measure hidden infestation of the seeds with weevils, we use the method of colouring with potassium permanganate 1% or with fuchsine. The sample to be treated is made up of 400 random seeds from the sample. We then studied it with a magnifying glass, immediately after colouring.

After the analyses mentioned above, we measured infestation degree. Seed infestation with weevils has three degrees:

- 1<sup>st</sup> degree: 1 kg sample contains up to 5 live weevils;
- 2<sup>nd</sup> degree: 1 kg sample contains up to 6-10 live weevils;
- 3<sup>rd</sup> degree: 1 kg sample contains over 10 live weevils.

For animal infestation, there are no degrees: it is expressed by the number of live pests per 1 kg of sample.

## RESULTS AND DISCUSSION

Table 1 shows results of measurements of seed samples from studied warehouses.

Results of measurements of the sanitary state of the seeds are expressed in percentage depending on the amount analysed or the infestation degree. Assessment criteria of the attack are established in accordance with guidelines supplied by the central organising body of agriculture. Results are recorded in the analyses bulletin, accompanied by the indication of the method used, by the size of the sample analysed, including the treatment previously applied to the seed sample. Authorised laboratories issue the formal documents concerning the health state of the seeds.

Thus, in 7 of the analysed warehouses we found the pest *Mus musculus*. Of the total 35,086 t of wheat we controlled, the whole amount was **weakly** attacked (Table 1).

The pest *Tribolium confusum* was present in 5 of the wheat warehouses we controlled. Attack assessment is as follows:

- 19,750 t **weakly** attacked;
- 900 t **medium** attacked;
- 500 t **strongly** attacked.

Table 1.

## Pest situation in the main warehouses of the Timis County in 2006

Pest	Warehouse	Produce stored	Amount in the warehouse [t]	Amount controlled [t]	Results of assessment				
					No attack [t]	Attack [t]	Attack assessment		
							Weak	Medium	Strong
<i>Mus musculus</i>	BELINȚ	Wheat	323	323	-	323	323	-	-
	LOVRIN		1.100	1.100	-	1.100	1.100	-	-
	CĂRPINIȘ		11.400	11.400	-	11.400	11.400	-	-
	JIMBOLIA		7.000	7.000	-	7.000	7.000	-	-
	TIMIȘOARA		14.963	14.963	-	14.963	14.963	-	-
	PECIU NOU		200	200	-	200	200	-	-
	GIULVĂZ		100	100	100	-	-	-	-
	<b>TOTAL</b>		<b>35.086</b>	<b>5.086</b>	<b>100</b>	<b>34.986</b>	<b>34.986</b>	-	-
<i>Tribolium confusum</i>	SÎNNICOLAUL MARE	Wheat	18.500	18.500	-	18.500	18.500	-	-
	BANLOC		1.300	1.300	-	1.300	-	800	500
	JEBEL		3.000	3.000	2.300	700	700	-	-
	DETA		250	250	250	-	-	-	-
	JAMU MARE		650	650	-	650	550	100	-
	<b>TOTAL</b>		<b>23.700</b>	<b>23.700</b>	<b>2.550</b>	<b>21.150</b>	<b>19.750</b>	<b>900</b>	<b>500</b>
<i>Tribolium confusum</i>	SÎNNICOLAUL MARE	Sunflower	2.700	2.700	2.700	-	-	-	-
	PECIU NOU		1.700	1.700	-	1.700	1.700	-	-
	<b>TOTAL</b>		<b>4.400</b>	<b>4.400</b>	<b>2.700</b>	<b>1.700</b>	<b>1.700</b>	-	-
<i>Sitophilus granarius</i>	DETA	Wheat	250	250	-	250	250	-	-
	JAMU MARE		1.263	1.263	990	273	273	-	-
	BANLOC		1.300	1.300	-	1.300	300	1.000	-
	JEBEL		3.000	3.000	3.000	-	-	-	-
	PERIAM		300	300	-	300	300	-	-
	BELINȚ		323	323	-	323	-	323	-
	LUGOJ		500	500	500	-	-	-	-
	<b>TOTAL</b>		<b>936</b>	<b>6.936</b>	<b>4.490</b>	<b>2.446</b>	<b>1.123</b>	<b>1.323</b>	-
	LUGOJ	Sunflower	83	83	-	83	83	-	-
	JAMU MARE		500	500	500	-	-	-	-
	CĂRPINIȘ		3.900	3.900	-	3.900	3.900	-	-
<b>TOTAL</b>	<b>4.483</b>	<b>4.483</b>	<b>500</b>	<b>3.983</b>	<b>3.983</b>	-	-		
<i>Sitotroga cerealella</i>	BANLOC	Maize	550	550	-	550	550	-	-
	JIMBOLIA		12.000	12.000	-	12.000	12.000	-	-
	TIMIȘOARA		40	40	-	40	40	-	-
	<b>TOTAL</b>		<b>12.590</b>	<b>12.590</b>	-	<b>12.590</b>	<b>12.590</b>	-	-

The same pest is also in sunflower kept in 2 of the analysed warehouses. Of the 4.400 t stored, only 1.700 t were **weakly** attacked.

The pest *Sitophilus granarius* was found in 7 wheat warehouses and in 3 sunflower warehouses. Of the 6.936 t of **wheat** we analysed, 1.123 t were weakly attacked, and 1.323 were medium attacked.

In **sunflower**, of the 4.400 t stored and analysed, only 1.700 t were **weakly** attacked.

The pest *Sitotroga cerealella* was present in only 2 of the warehouses we controlled, in maize grains. Thus, of the 12.590 t we analysed, all the amount was **weakly** attacked.

The total amount of wheat stored in different warehouses in the County of Timis was infested, particularly by *Mus musculus*, *Tribolium confusum*, and *Sitophilus granarius*, but there was no *Sitotroga cerealella* (Table 2 and Figure 1).

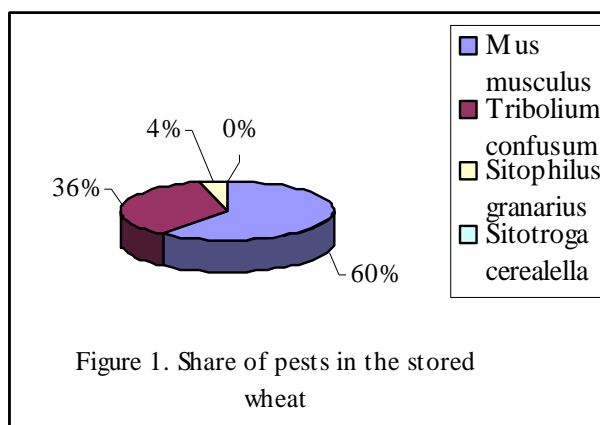
As for the stored maize, it was only infested by the *Sitotroga cerealella* (the whole amount of grains stored) (Table 2 and Figure 2).

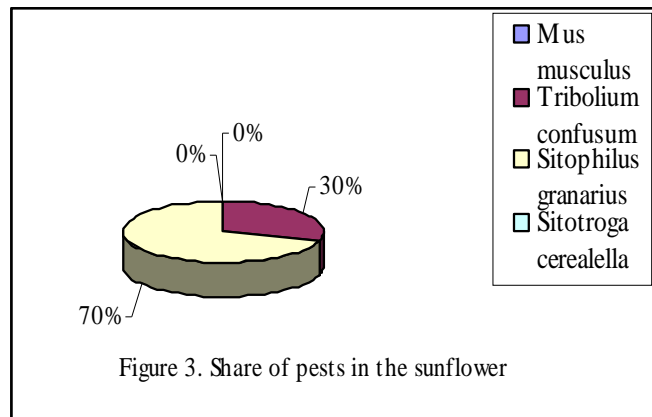
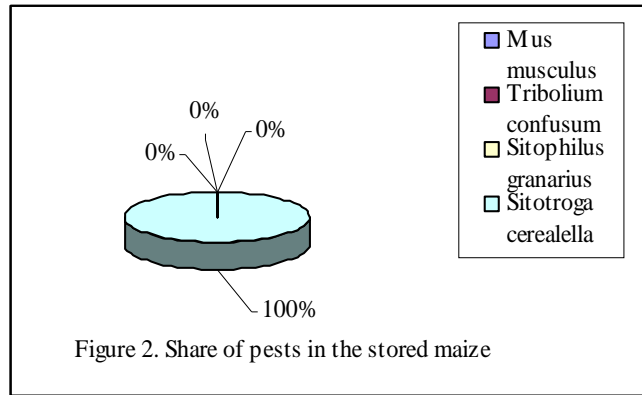
In sunflower seeds kept in different warehouses in the County of Timis, we identified species of *Tribolium confusum* and *Sitophilus granarius* (Table 2 and Figure 3).

Table 2

Infested status by the *Sitotroga cerealella*

Produce stored	Amount in the warehouse [t]	ATTACK [t]			
		<i>Mus musculus</i>	<i>Tribolium confusum</i>	<i>Sitophilus granarius</i>	<i>Sitotroga cerealella</i>
Wheat	59.000	35.000	21.000	2.400	-
Maize	13.000	-	-	-	12.600
Sunflower	9.000	-	1.700	4.000	-





➤ 19.750 tone slab atacate;

### CONCLUSIONS

On the whole, pest attack is weak in the 13 warehouses we studied, except for the warehouses in Banloc, Jamu Mare, and Belint.

All this is caused by the following factors:

- All the warehouses were disinfected with Reldan 125 ml/t.
- They gassed Delicia (2 times), Fostoxin (2 times), or Dachosal (3-5 tablets/t).
- They put rodent baits (Baraki and Storm) in all warehouses.
- Upon storage, seeds were not infested, as they were brought at the standard moisture degree.
- Temperature and air conditions were optimal.
- Of the 4 pests identified, *Tribolium confusum* and *Mus musculus* are the most frequently met.

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