ENTOMOLOGIA APPLICATA

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An alternative technique of mating disruption in the control of Ephestia kuehniella Zell. (Lepidoptera Pyraloidea, Phycitidae)

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The results obtained in a department of a food industry (3800 m3) infested by Ephestia kuehniella Zell. (Mediterranean flour moth) are reported.

An original dispenser made of a cylindrical neoprene “lace” (3 mm in diameter) activated with 50 mg of TDA per linear meter was installed, in particular under the machineries. This “lace” was designed to daily release 250 – 300 µg /m of TDA for more than three months. In the department, 30 meters of the “lace” were replaced every 3 months. The estimated dose of TDA was 0,39 mg/ m^3 with daily distribution of 2 µg/ m^3. It was observed that it was necessary to integrate the application of high concentrations of TDA with accurate cleaning in the crevices of the machineries.

The captures of Ephestia kuehniella registered every 15 days during 8 months with 6 Funnel Traps are compared with data registered in the past two years before the application of this method.

Catches during 8 months preceding the trial beginning

DATE	Trap 1	Trap 2	Trap 3	Trap 4	Trap 5	Trap 6	Total	TREATEMENTS
19/03/2013	0	0	0	1	1	8	10	
12/04/2013	15	30	0	3	1	25	74	Only cleaning
22/04/2013	18	13	1	1	1	2	36	Only cleaning
10/05/2013	8	15	4	2	1	1	32	Only cleaning
21/05/2013	6	12	6	1	0	1	28	
07/06/2013	11	10	10	3	0	0	35	
18/06/2013	10	8	10	2	2	3	35	Only cleaning
04/07/2013	15	30	20	0	1	1	67	Only cleaning
23/07/2013	13	30	0	0	12	10	65	Cleaning and pyrethrum
09/08/2013	6	20	12	0	2	0	40	
20/08/2013	6	8	3	1	1	3	22	
18/09/2013	0	4	4	0	0	0	12	Only cleaning
30/09/2013	0	0	0	0	0	0	0	
11/10/2013	3	0	0	0	0	0	12	Only cleaning
22/10/2013	2	3	5	0	0	1	11	Only cleaning

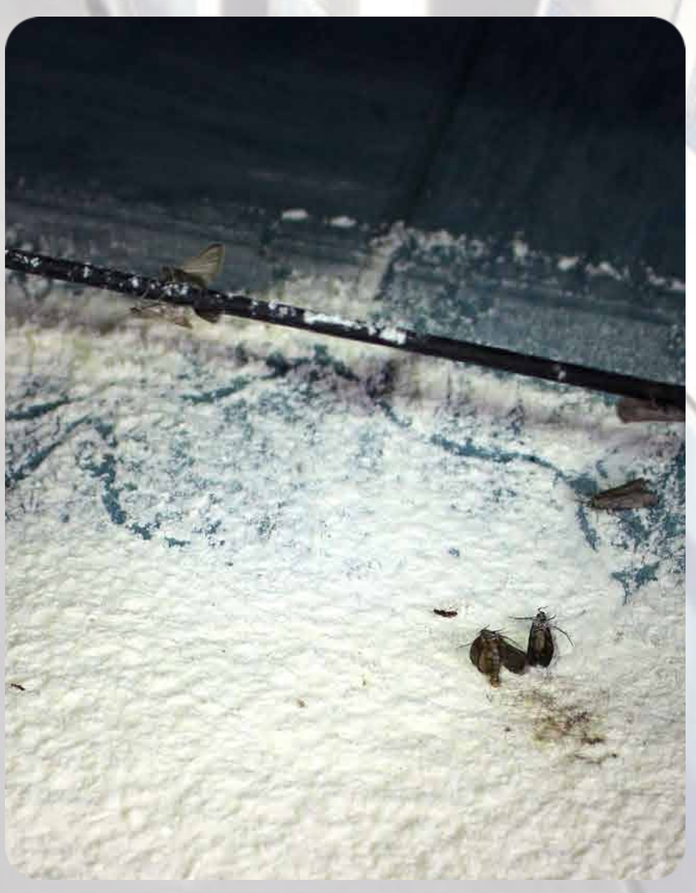
TOTAL OF CATCHES **479**

Catches during 8 months of trial

DATE	Trap 1	Trap 2	Trap 3	Trap 4	Trap 5	Trap 6	Total	TREATEMENTS
08/11/2013	10	5	4	0	0	0	20	first use of “lace”
19/11/2013	3	4	4	0	0	5	16	
13/12/2013	1	0	1	0	0	0	2	
23/12/2013	0	0	2	0	0	1	3	
10/01/2014	1	1	1	0	0	3	6	
24/01/2014	0	0	0	0	0	0	0	
07/02/2014	1	1	0	0	0	0	3	
24/02/2014	0	2	0	0	0	0	2	change of “lace”
07/03/2014	0	0	1	0	0	0	1	
24/03/2014	0	1	0	0	0	0	1	
11/04/2014	2	2	0	0	0	0	4	
28/04/2014	0	0	0	0	0	0	0	
09/05/2014	0	2	1	0	3	3	9	change of “lace”
23/05/2014	0	0	0	0	0	0	0	
13/06/2014	0	0	1	0	0	0	1	
27/06/2014	0	1	0	0	0	0	1	

TOTAL OF CATCHES **69**

Note: data collected the 08/11/2013 refer to the catches during the 15 days preceding the use of “lace”



RESULTS AND CONCLUSION

The reduction in the number of catches of males in the Funnel Traps doesn’t guarantee the full success of the application (in fact the males can copulate at least one time before the capture); as a consequence, further experiments were carried out in a Peet Grady Chamber (39 m^3) at our Laboratory of Applied Entomology. In this case a test without “lace” was carried out as Control: 10 virgin females and 10 males of this moth were released and in the Chamber 4 Petri dishes (12 cm diameter) with special food for oviposition were placed. After this test, a 30 cm “lace” (corresponding to 15 mg of TDA) was set in the Chamber; after one week other 10 virgin females and 10 males were released; the oviposition was verified after 2 weeks. In the Laboratory test without “lace” a very high oviposition in 2 Petri Dishes was verified, but some tests using the TDA activated “lace” confirmed absence of oviposition.

In practice, the number of captures carried out with pheromone traps confirms the success of the application of this method. It is possible to state that a concentration of 0,39 mg/ m^3 of TDA with a daily distribution of 2 µg/m^3 is enough to stop an infestation of Ephestia kuehniella.

The use of this neoprene “lace” is very practical and serviceable, especially in “difficult” departments of food industries.