Opportunities and limitations of mass trapping of difficult-to-control fruit pests: efforts in Hungary

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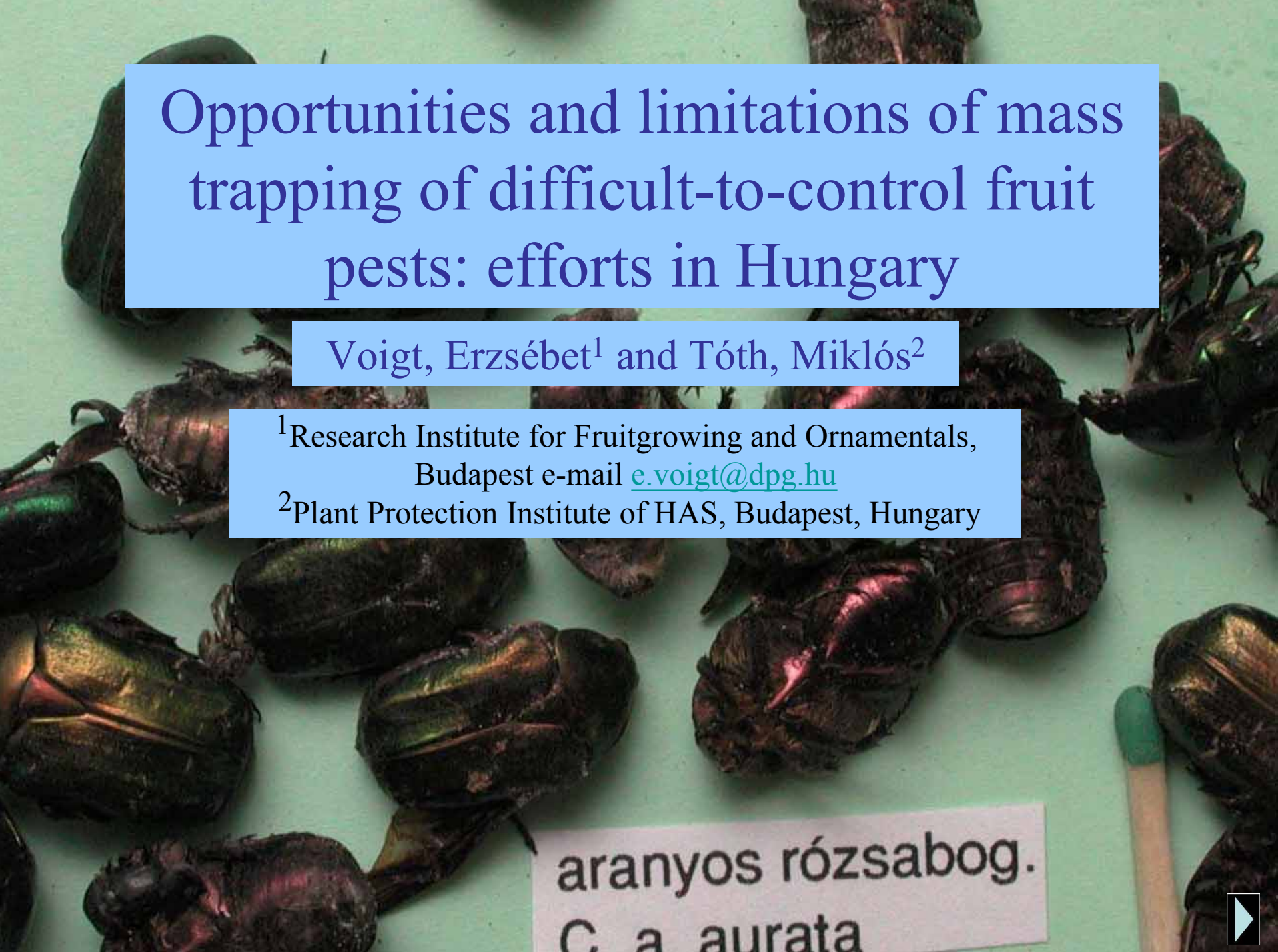


There are a number of unsuccessful cases reported in previous literature for pest control through mass trapping. However, in recent years in case of some selected pests (could be called „difficult-to control insects”) promising new results were obtained.

Pests studied by us in Hungary:

- *Anomala vitis* Fabr. and *A. dubia* Scop. (Coleoptera, Scarabaeidae, Rutelinae),
- *Epicometis (Tropinota) hirta* Poda (Coleoptera, Scarabaeidae, Cetoniinae)
- *Cetonia a. aurata* L. and *Potosia cuprea* Fabr. (Coleoptera, Scarabaeidae, Cetoniinae)
- *Cossus cossus* L.(Lepidoptera, Cossidae)

Anomala vitis and *A. dubia*

Apart from leaf damage widely known in literature, in orchards, especially in peaches, the beetles prefer to feed on ripening fruits, resulting in low quality fruit, which may be impossible to market.

In 1994 the synthetic compound (*E*)-2-nonenol has been discovered as the sex attractant highly attractive for males of both *Anomala* species (Tóth et al., 1994).

A high capacity funnel trap (CSALOMON® VARb3) developed by the Plant Protection Institute proved to be excellent for capturing both pests in large numbers.

Year	*A. vitis* (mean catch / trap)			*A. dubia* (mean catch / trap)		
	Outer row of traps	Inner row of traps	Control traps inside	Outer row of traps	Inner row of traps	Control traps inside
2000	57.0	39.2	Not tested	49.0	24.8	Not tested
2001	79.9	75.2	71.8	16.7	11.3	10.0
2002	113.6	104.3	74.0	53.7	40.3	7.5

Table shows mean catches of *Anomala* scarabs in sex attractant traps set up at the perimeter or inside a peach orchard in 2000, 2001 and 2002.

Year	Total beetles caught	
	A. vitis	*A. dubia*
2000	2162	1607
2001	5334	958
2002	5508	2264

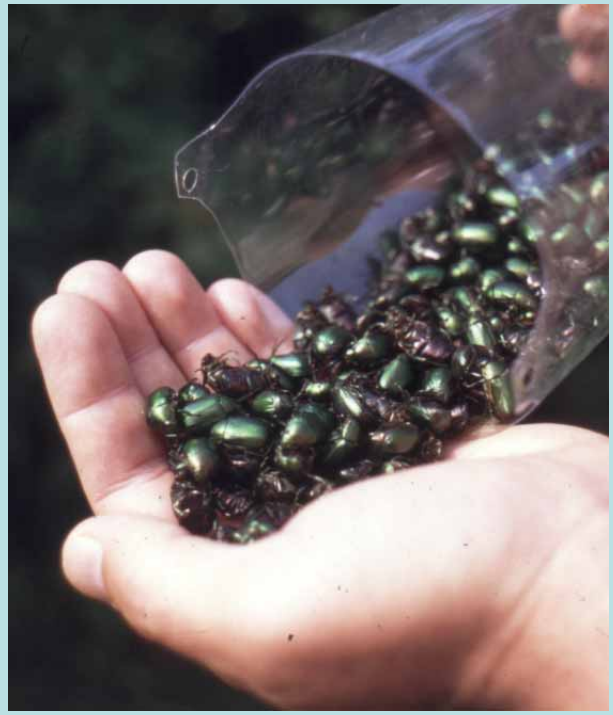
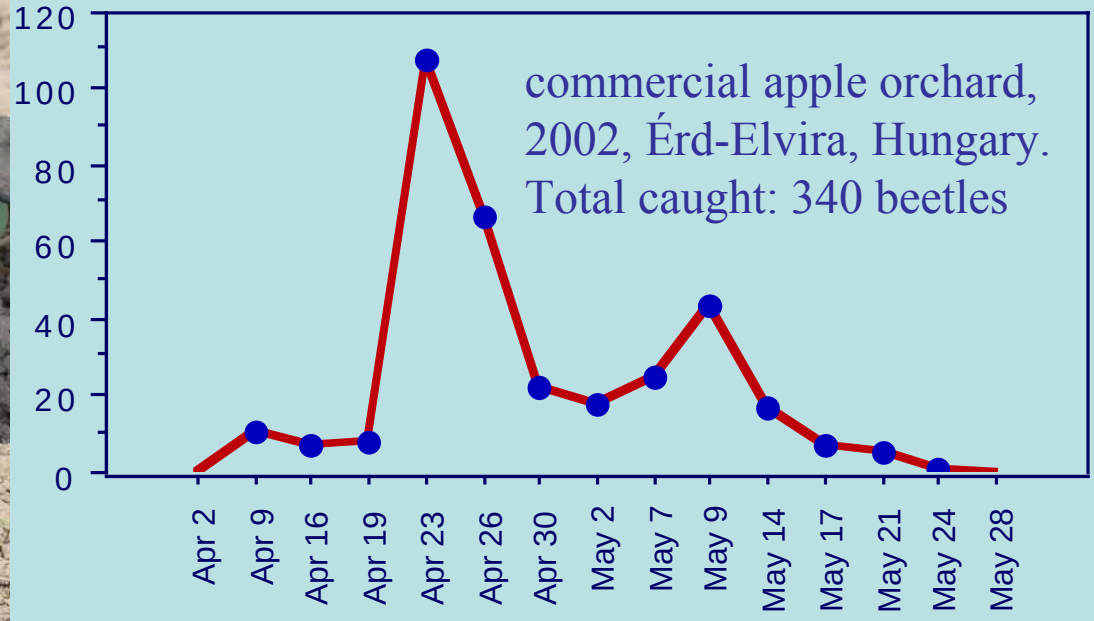


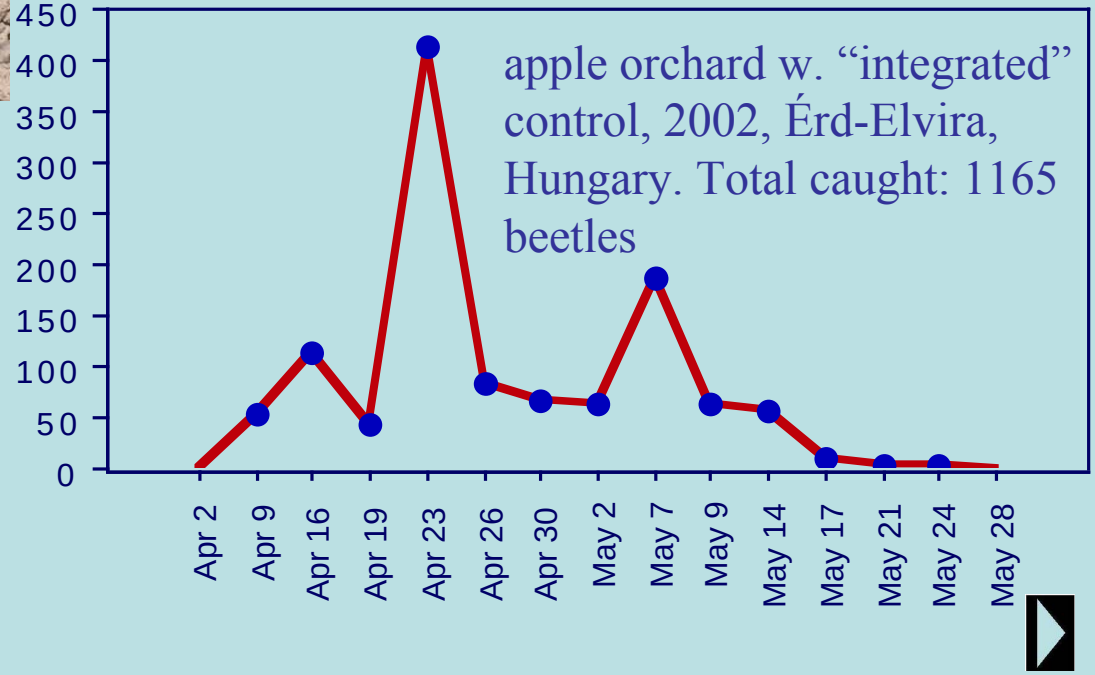
Table shows total catches of *Anomala* scarabs in sex attractant traps during the three years of the present mass trapping study.

Epicometis (Tropinota) hirta

The synthetic floral attractant for *E. hirta* contains cinnamic alcohol and (*E*)-anethol.

Since this insect is very sensitive to light blue colour, this visual cue is included in the trap design.





The flight of *E. hirta* is very long. The beetle probably follows the seasonal blossoming of different plants and thus it can be trapped in the trap which is practically an “artificial flower”.

Mass trapping:

A total of 72 traps were set up in an apple orchard in the middle of Hungary, from the middle of April (main blossoming period for apple in Hungary is between April 20 and May 10), along the margins of the orchard.

These traps caught a total of 7823 *E. hirta* beetles until the end of May (mean of 109 beetle/trap). Despite of this we found adult beetles in the middle of the orchard feeding on blossoms in the middle rows of the orchard.

Despite these incertainities the use of mass trapping of *E. hirta* can be advised in intensive cultures like strawberries, where the destroying of a low percentage of flowers already impacts on fruit production.

Ivan Sivcev (Beograd, Serbia) using the same trap reported on successful mass trapping trials to control *E. hirta* in the north of Yugoslavia on strawberries.

Cetonia a. aurata

Photo: Voigt E.

The scarabs *Cetonia a aurata* and *Potosia cuprea* are also causing damages on flowers and especially in ripening fruit.

The adult beetles can be observed all summer long, even at the end of August. They appear to be strongly attracted to ripening fruits.

Potosia cuprea

Photo: Molnár

For capturing ***Cetonia a. aurata*** and ***P. cuprea*** a synthetic floral bait has been developed, containing 2-phenylethanol, 3-methyl eugenol and *trans*-anethol 1:1:1 (Tóth et al., 2005)

In the presence of the chemical attractant, these beetles showed some preference for light blue so the trap design similar to the one for *E. hirta* could be used efficiently also for catching these scarabs.

VARb3k traps with the *Cetonia*/*Potosia* attractant managed to decrease damage levels in peach and nectarine orchards in Hungary (region of Debrecen; Voigt et al., 2005) and Croatia (region of Zadar; pers. comm. from B. Baric)

The European goat moth *Cossus cossus* has hidden life habits, and a developmental cycle spannning over 2 years, which in many cases means that the presence of the pest will be detected only when the orchard trees are already heavily damaged.

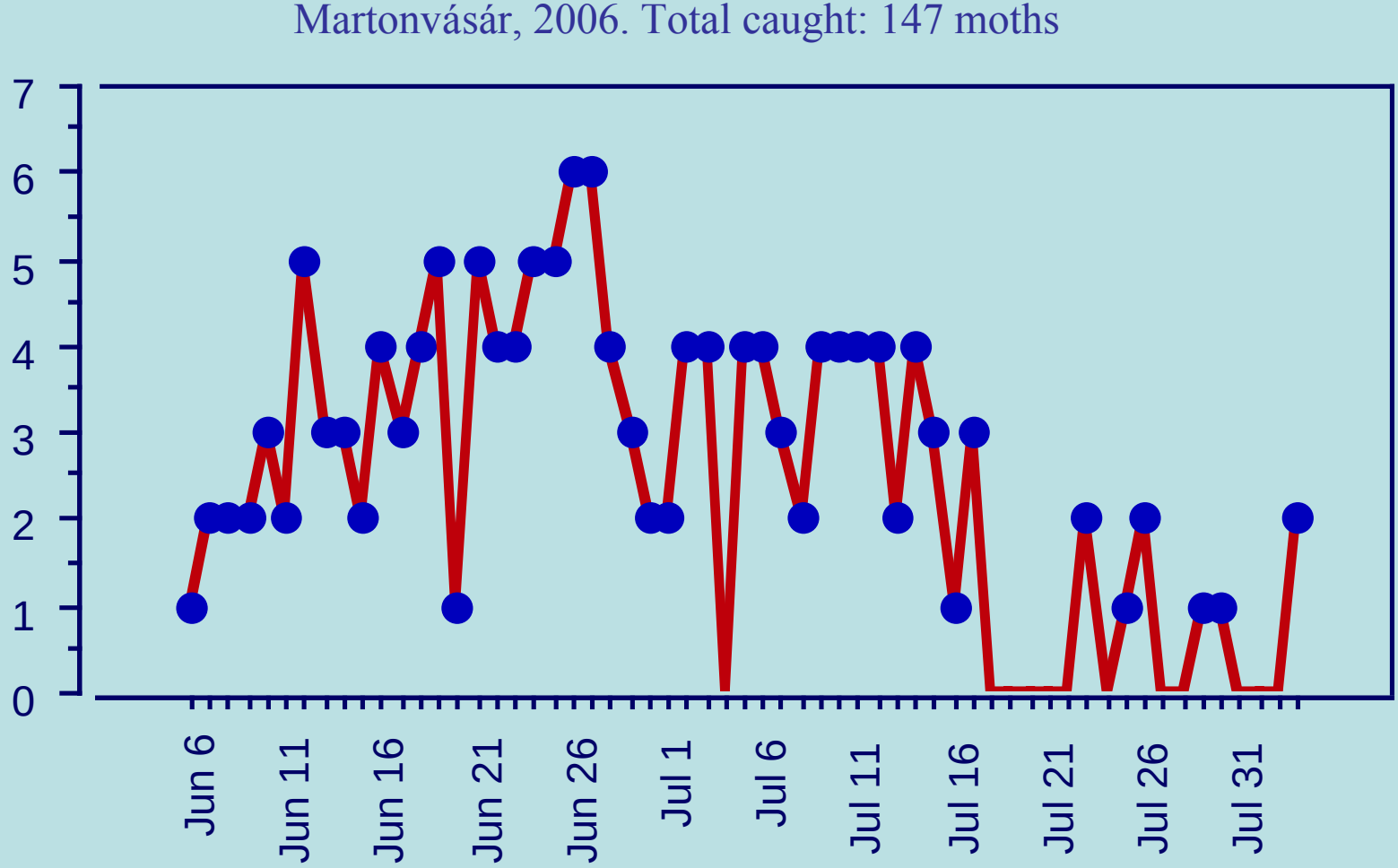


Figure shows the long seasonal flight of *C. cossus* in the middle of Hungary

Succesful mass trapping tests with pheromone traps have been reported on from Italy, France and elsewhere in southern Europe.

In Hungary we conducted mass trapping trials at two sites:

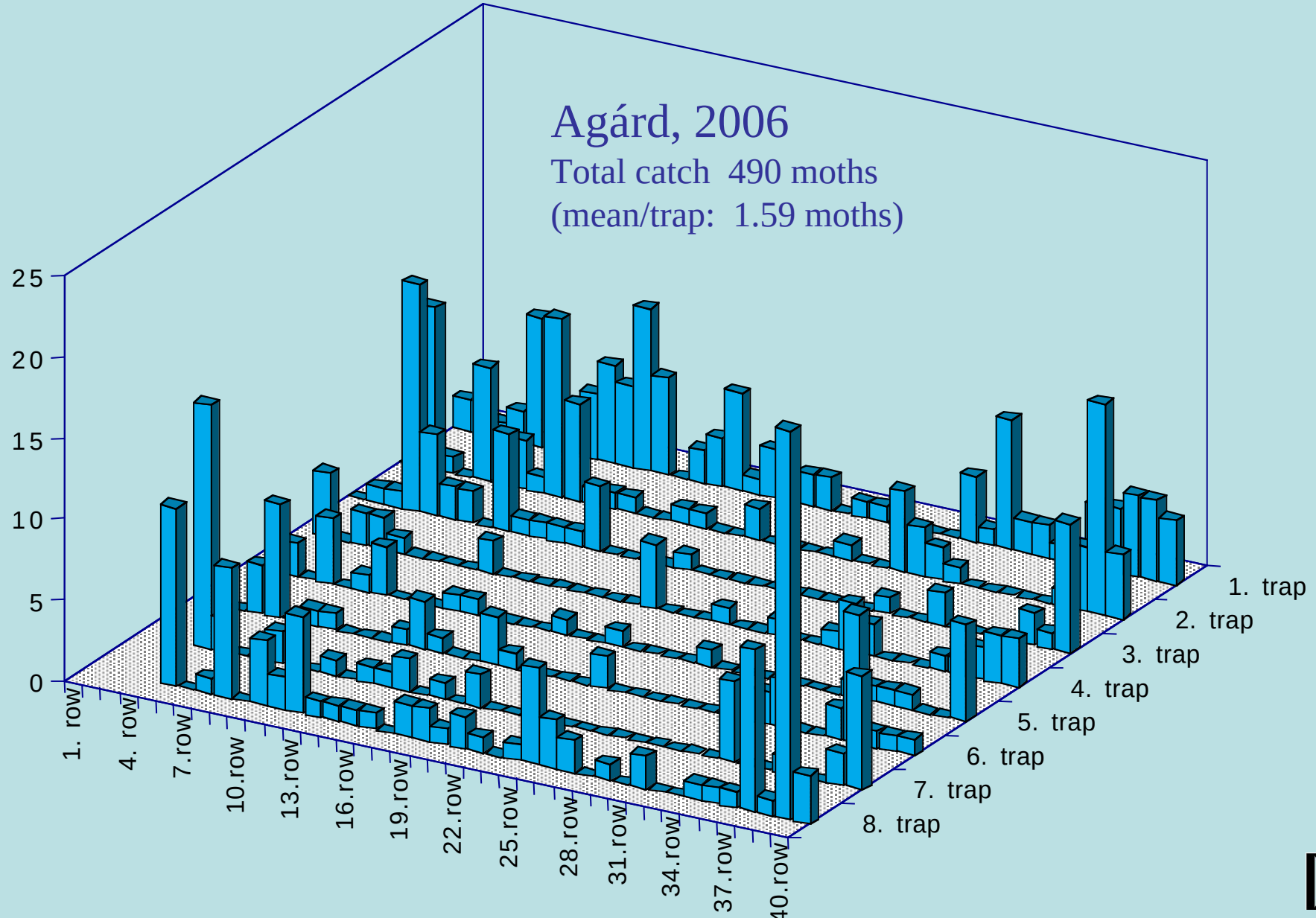
in an apricot orchard in South-western Hungary (from 2002 on)

and in a sour cherry orchard in the middle of Hungary (from 2006 on)

• Year	Number of traps	Total catch	Mean / trap
2002	74	75	1,01
2003	76	94	1,24
2004*	100	52	0,52
2005*	140	115	0,82
2006	136	92	0,68

Table shows numbers caught in the mass trapping trial at Visz (South-western Hungary) between 2002 - 2006

Figure shows distribution of *C. cossus* catches in the mass trapping trial at Agárd (middle of Hungary)



Conclusions - 1

- a basic requirement of mass trapping is the availability of high capacity trap designs using a highly active attractant bait
- mass trapping can be advised to be attempted only in special cases against certain pests
- mass trapping can be attempted in cases when the traps catch the damage-causing life stage (i.e. the adult in case of scarabs), or when the target pest is not a good flier (i.e. *C. cossus*)

Conclusions - 2

- If the bait is a sex pheromone, only males can be trapped, in the hope of decreasing male numbers to an extent which results in lack of fertile matings with females
- in cases with pests with long developmental cycle, an effect can be observed only after several years.
- despite the fact that in case of scarabs the traps capture very high numbers, a part of the population remains not trapped
- in some cases it is difficult to evaluate the effect of mass trapping, due to the difficulties of discerning earlier damage and recent damage (i.e. *C. cossus*), or damage levels are difficult to assess (i.e. due to mobility of beetles)


Many thanks for your kind attention