



HARMONIA AXYRIDIS

A PROBLEM OR A DISTRACTION?

Firouz KABIRI, BIOTOP,
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- Small, private company
- Old history and presence on the market
- **1975**: beginning of cooperation with INRA, on Trichogramma against the ECB,
- **1985**: starting commercialisation of *T. brassicae*,
- **1995**: beginning of Harmonia commercial activity

Producer of *Ephestia kuehniella*:

- **Trichogramma:** *T. brassicae* ; *T. evanescens*
- **Ladybirds:** *H. axyridis*, *A. bipunctata*, *H. variegata*
- **Predatory bugs:** *Macrolophus*, *Orius*, *Anthocoris*,
- **Predatory thrips:** *Franklinothrips vespiformis*

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BIOTOP and HARMONIA

- **our history:** success story of Trichogramma, leader with more than 85 000 ha of corn covered in different countries (more than 80% of the market),
- **our policy:**
 - high quality products, good efficacy,
 - big investment on quality control: in laboratory and in field,
- **Harmonia:**
 - small part of our turn over,
 - but considered as very important in term of communication, not only for Biotop, but also for the biological control in general,

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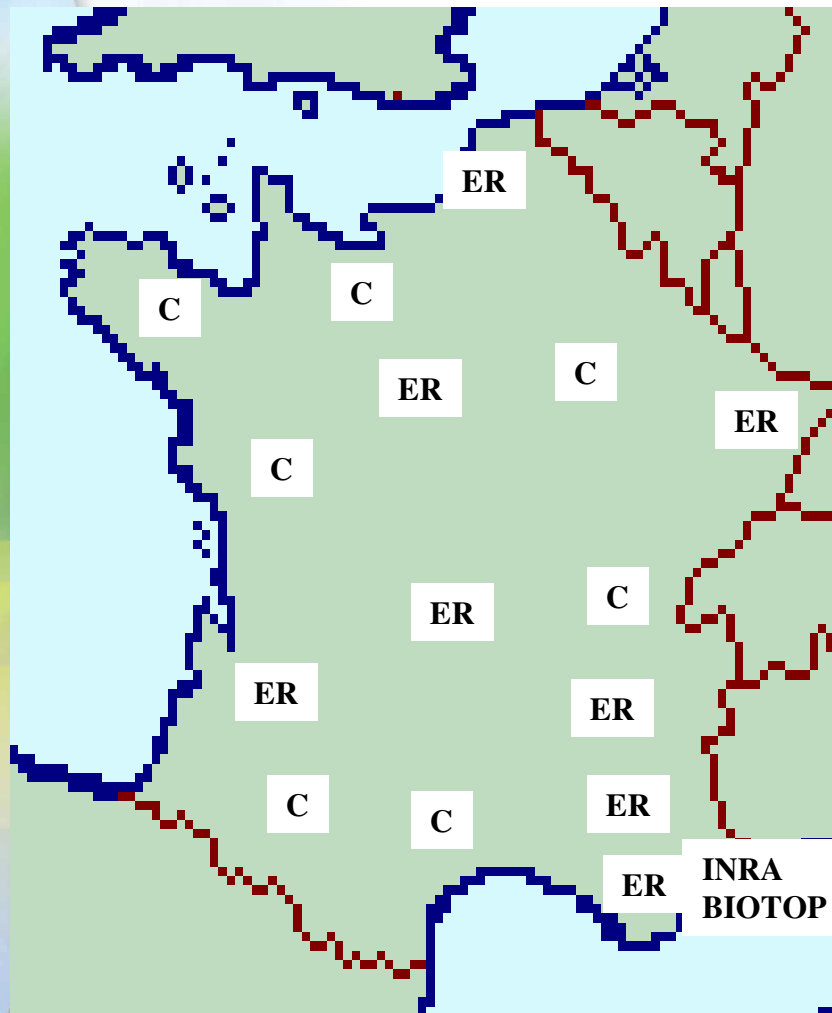
***H. axyridis* : North America**

- ladybirds entering in houses,
 - some problems in wine production (presence in grapes)
 - becoming the dominant species in some situations,

 - questions and controversy:
invasion = elimination of native ladybirds ?
- several introductions : the first in 1916 !
 - « problems » appear very late after releases:
pullulating populations after 1995 (establishement 1988)
 - Controversy about the origin of the invasive population:
Result of intentional releases or accidental introduction
(transported on freighters, into New Orleans, Seattle, ... ?)



HARMONIA IN EUROPE



- 1982 : Introduction by INRA, from China
- 1982 – 1990 : reared in laboratory (biology, mass rearing on Ephestia, ...)

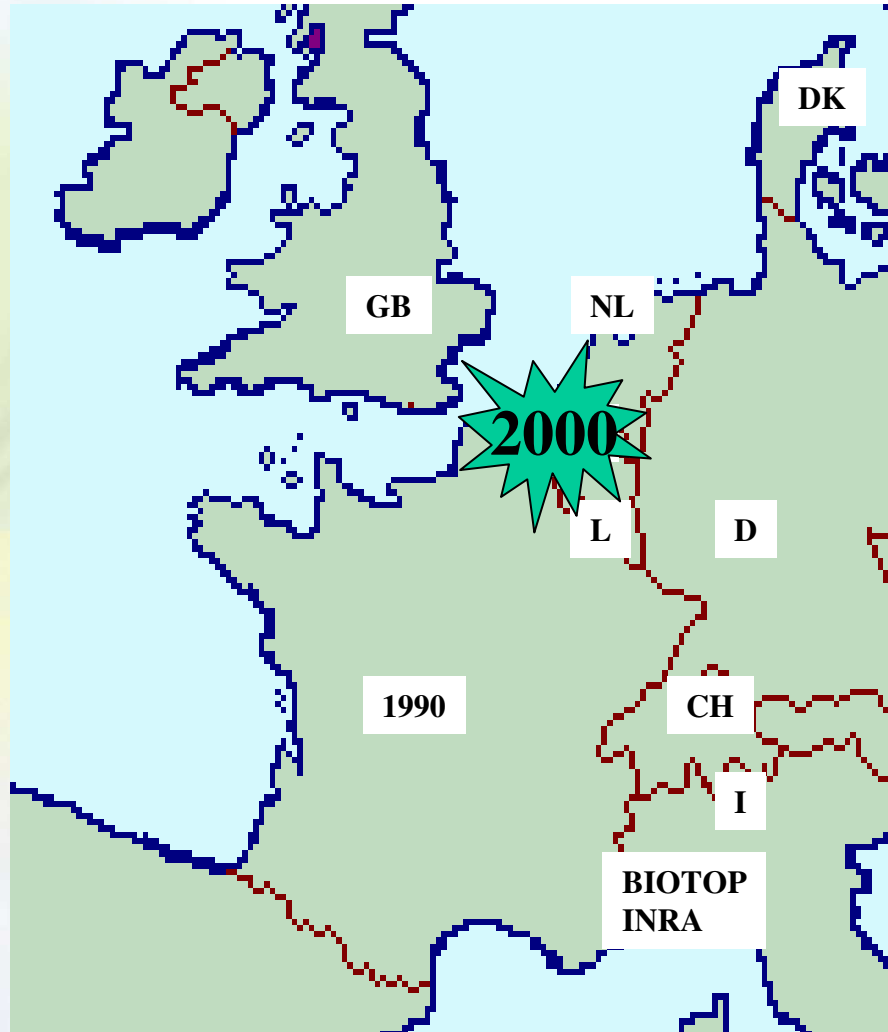
Experimental Releases (ER) started in 1990 :

- Antibes, Fréjus (fruit trees)
- Avignons (pear)
- Vichy (garden)
- Valence (cherry)
- Paris (garden)
- Lilles (hop trees)
- Alsace (hop trees)
- ...

Commercial releases (C) started in 1995



HARMONIA IN EUROPE





Why to use Harmonia and not native ladybirds?

Impossible to control all aphids by using Adalia (or any other unique beneficial)

Hyalopterus pruni

- not accepted by *A. bipunctata*,
- accepted by *H. axyridis* and *C. septempunctata*,

Aphis sambuci

- not suitable for *C. septempunctata*,
- suitable for *A. bipunctata*

Aphis nerii

- toxic for numerous ladybirds,
- non toxic for *Hippodamia variegata*

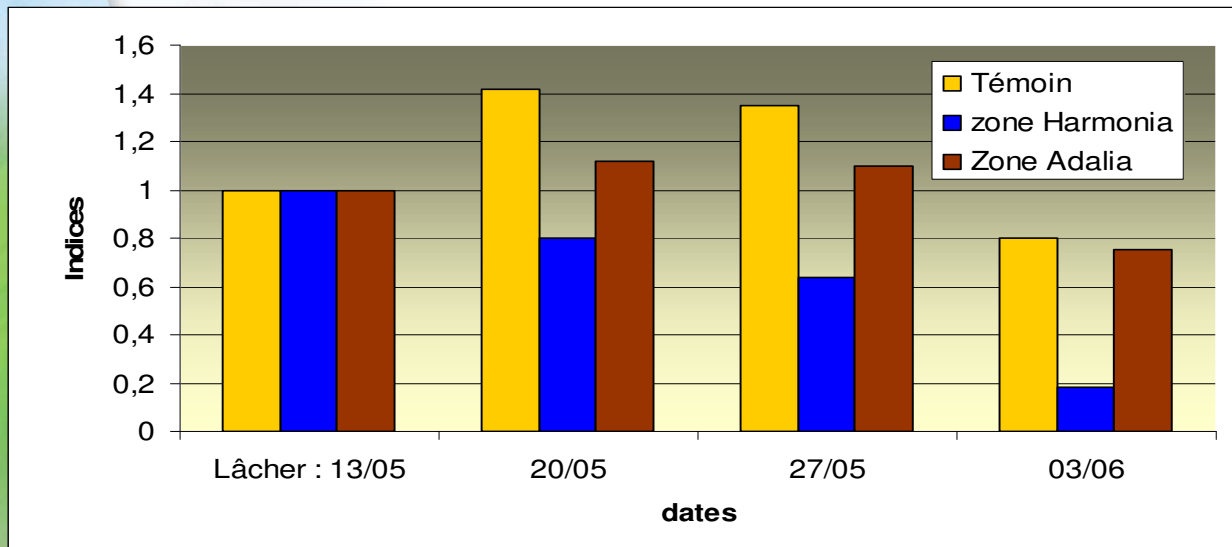
The problem is not only cost ; we need different species, because we have to look for efficacy,

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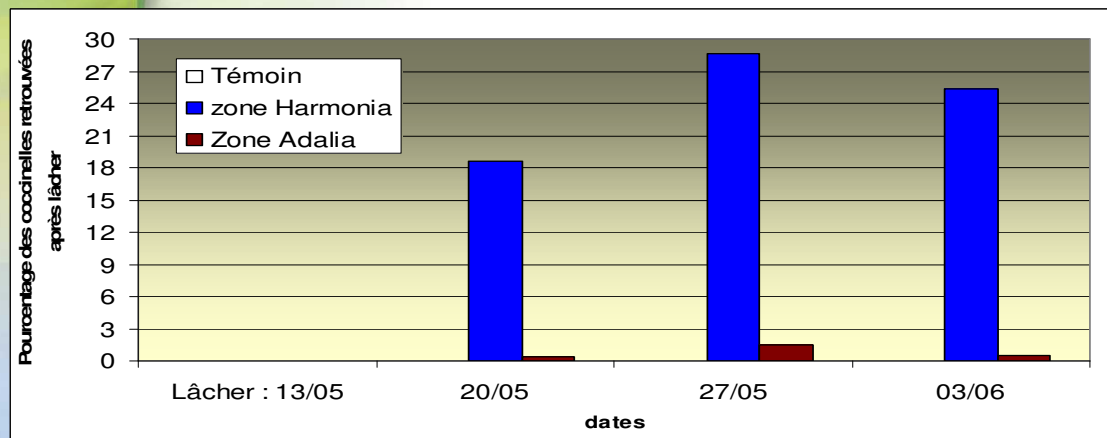


Harmonia and Adalia on rose bush



Harmonia (15 L / pl)
Good control of aphids,

Adalia (75 L / pl)
Very low control,
despite of higher rate
of use,



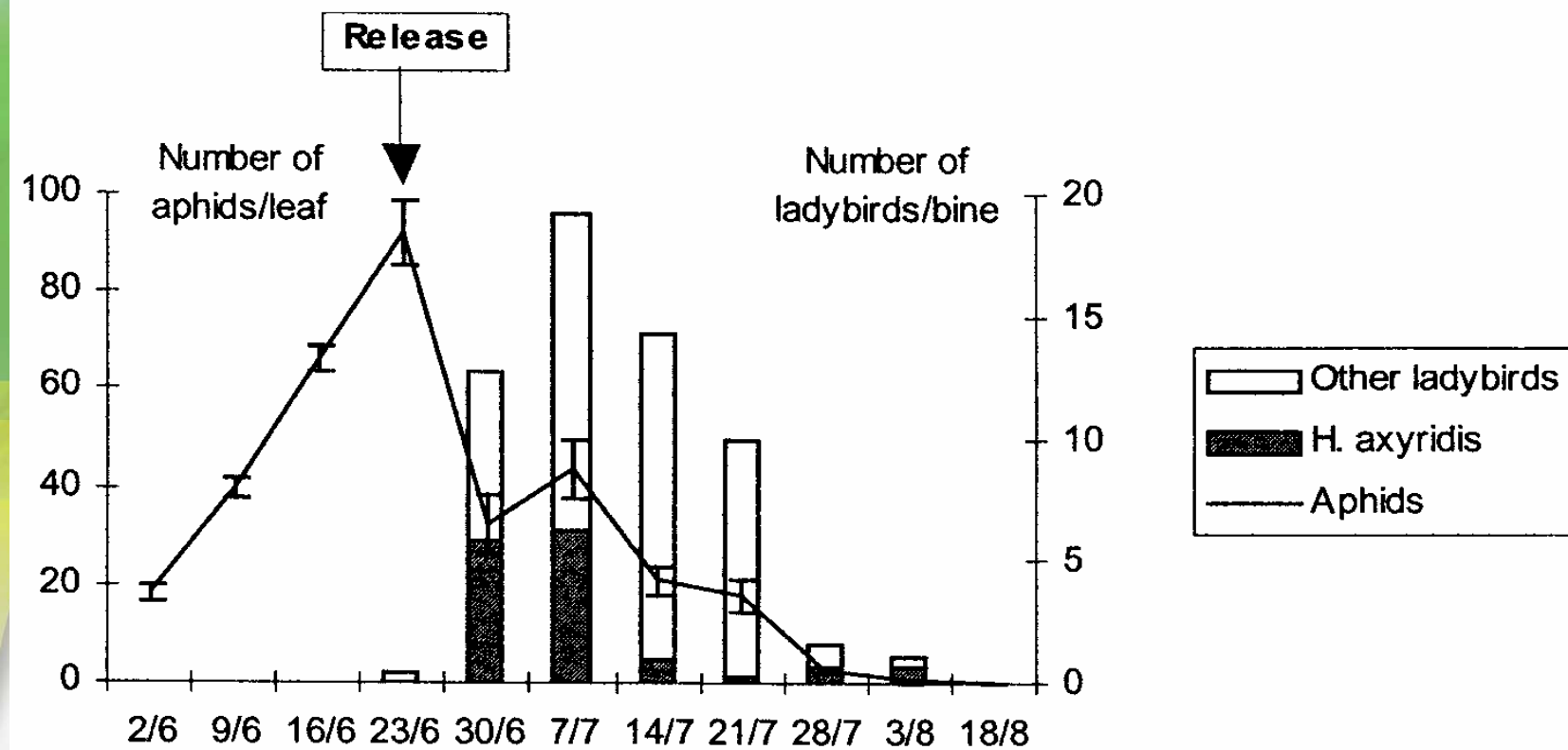
Harmonia larvae stay
on plants

Adalia larvae disappear



Harmonia and native ladybirds: some field observations

Aphids and Ladybirds on plants after release (larvae, 1997)

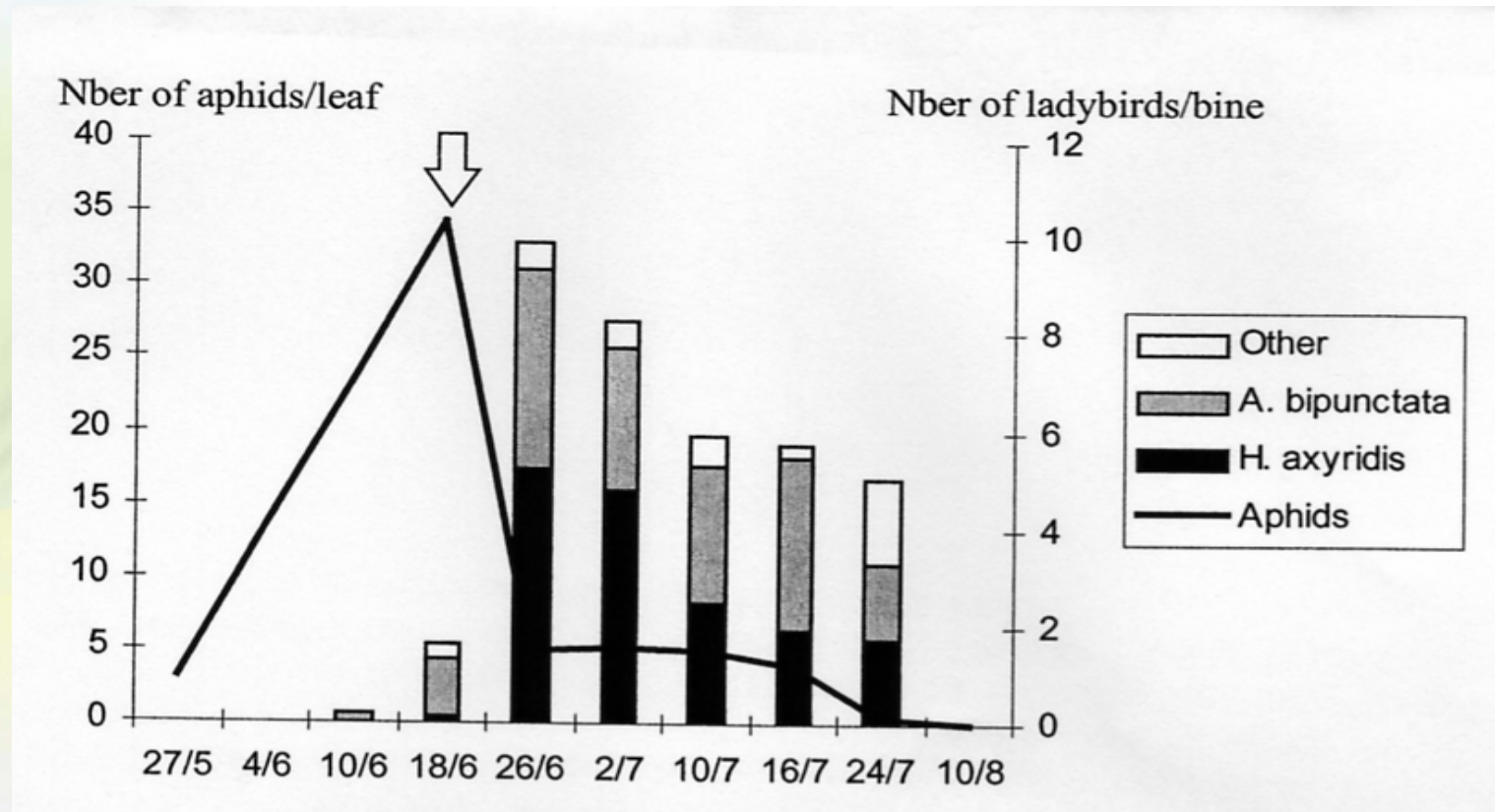


Plant Protection Services, Alsace 1997,
Use of *H.axyridis* against *Phorodon humuli* in hop field



Harmonia and native ladybirds: Some field observations

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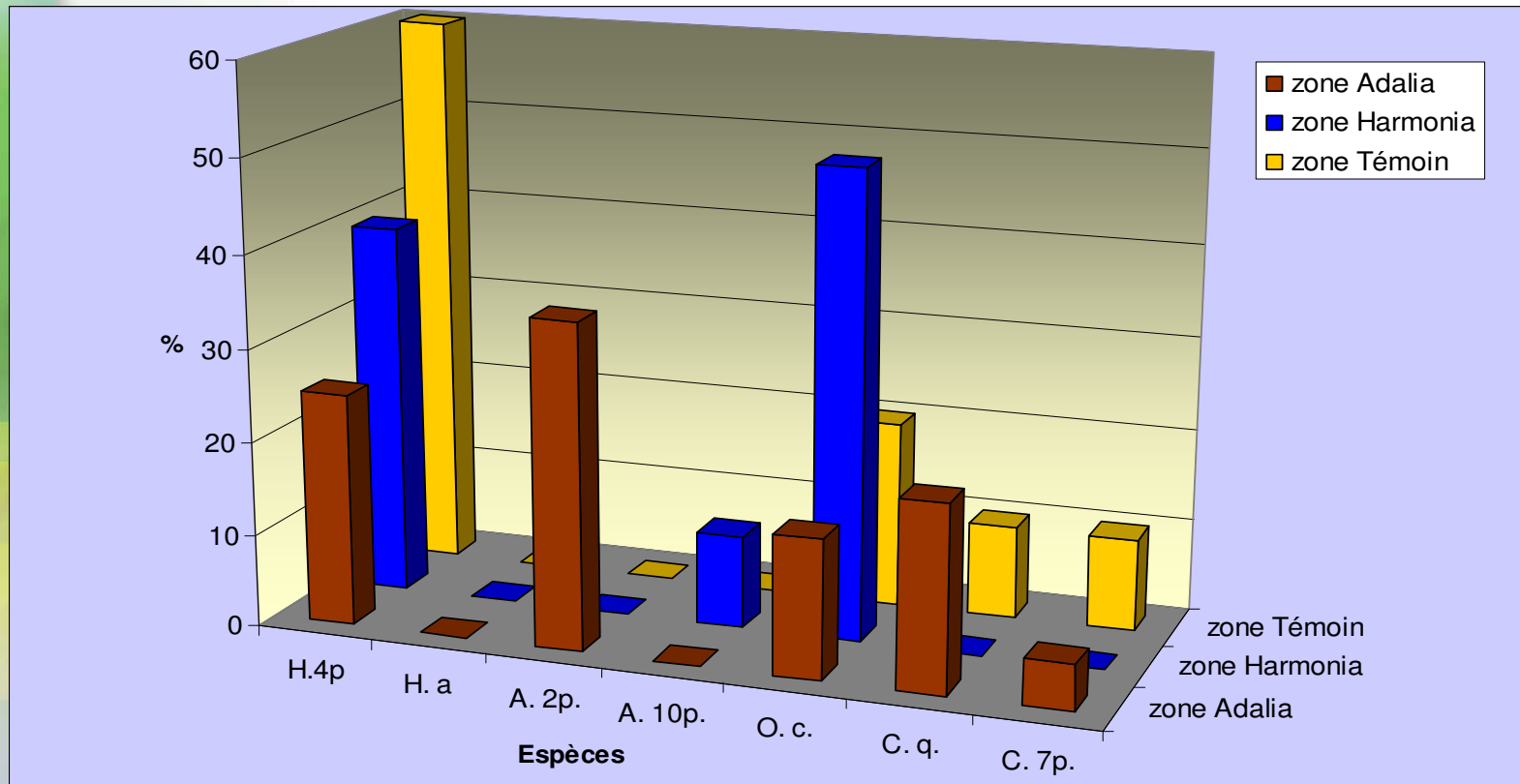


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Harmonia and native ladybirds: Some field observations

Released and wild ladybirds found on trees after release of
Harmonia (larvae) and Adalia (adults), Biotop, Cagne/mer, 2005



***Harmonia quadripunctata* and 2 other wild ladybirds
establishing on trees after release of Harmonia,**



Harmonia in France

More than 15 years after first releases:

- Established in nature ?
May be,
Never confirmed by observations, but likely,
- No report of pullulation in any area in France,
despite of releasing the « normal, flying » strain,
from 1990 until 2000,
- Attacked by natural enemies ?
Yes:
 - ants (larvae and eggs),
 - *Perelitus coccinellae* (adultes)



***H. axyridis* in Europe**

- Harmonia is not able to establish in all the biotopes,
- why did the invasion start in 2000 in Belgium and not earlier in other areas ? (any part in France, but also other countries as Switzerland, ...)
- Is the established strain in Belgium, GB,... the result of the INRA strain releases in France or other european countries ?
(it seems to start near ports, as in America?)
- was it possible to forecast such an evolution ?
even with a regulation ?



***H. axyridis* : the flightless strain**

Obtained naturally: selection of non flying insects from th original « natural » population

Objective : less dispersion for better efficacy

Other interesting consequences: elimination risk of pullulation,

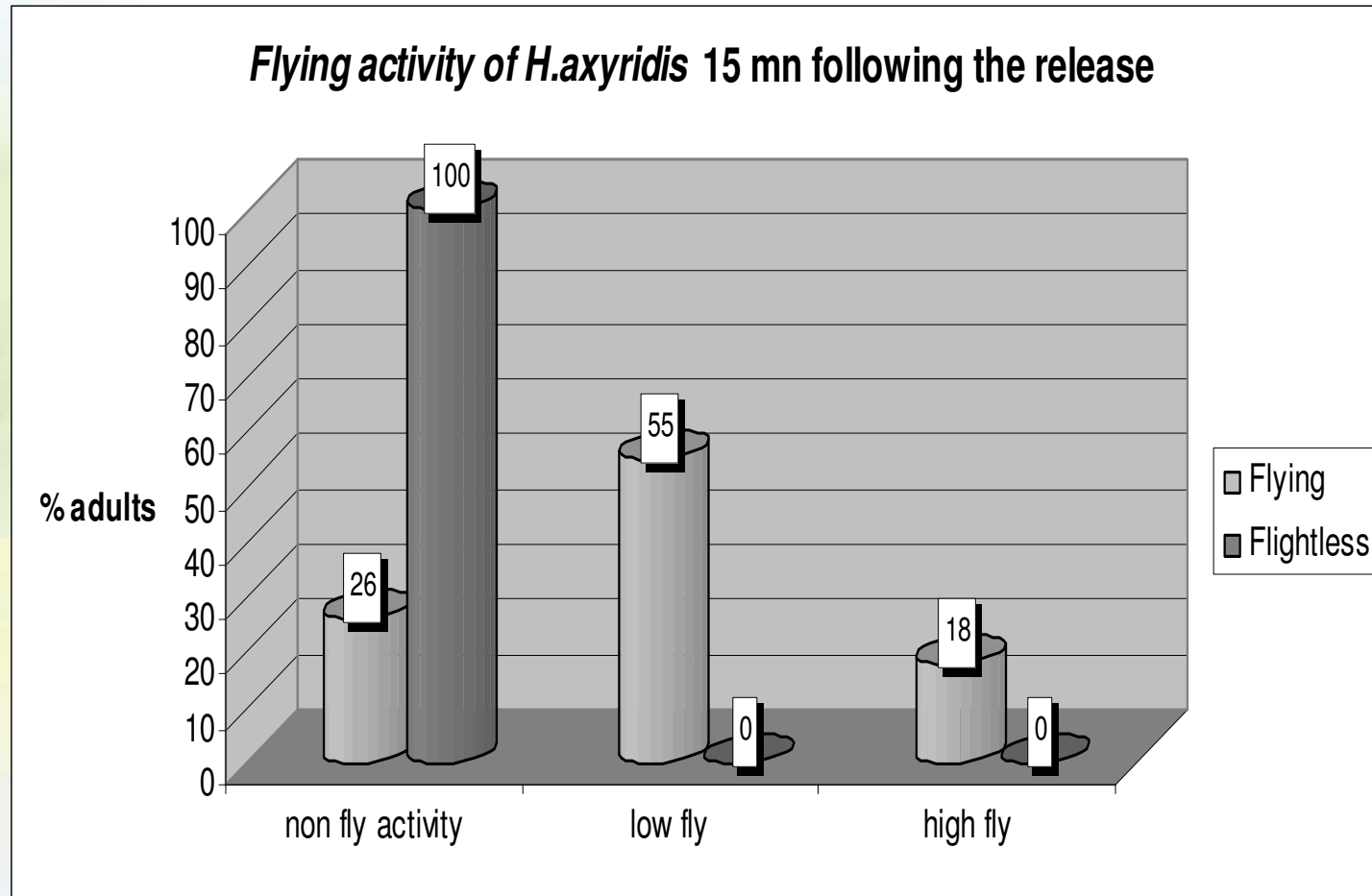
Very important : not GMO and not wingless, just flightless !
they all look quite normal, with all their wings !
(just muscle problem)

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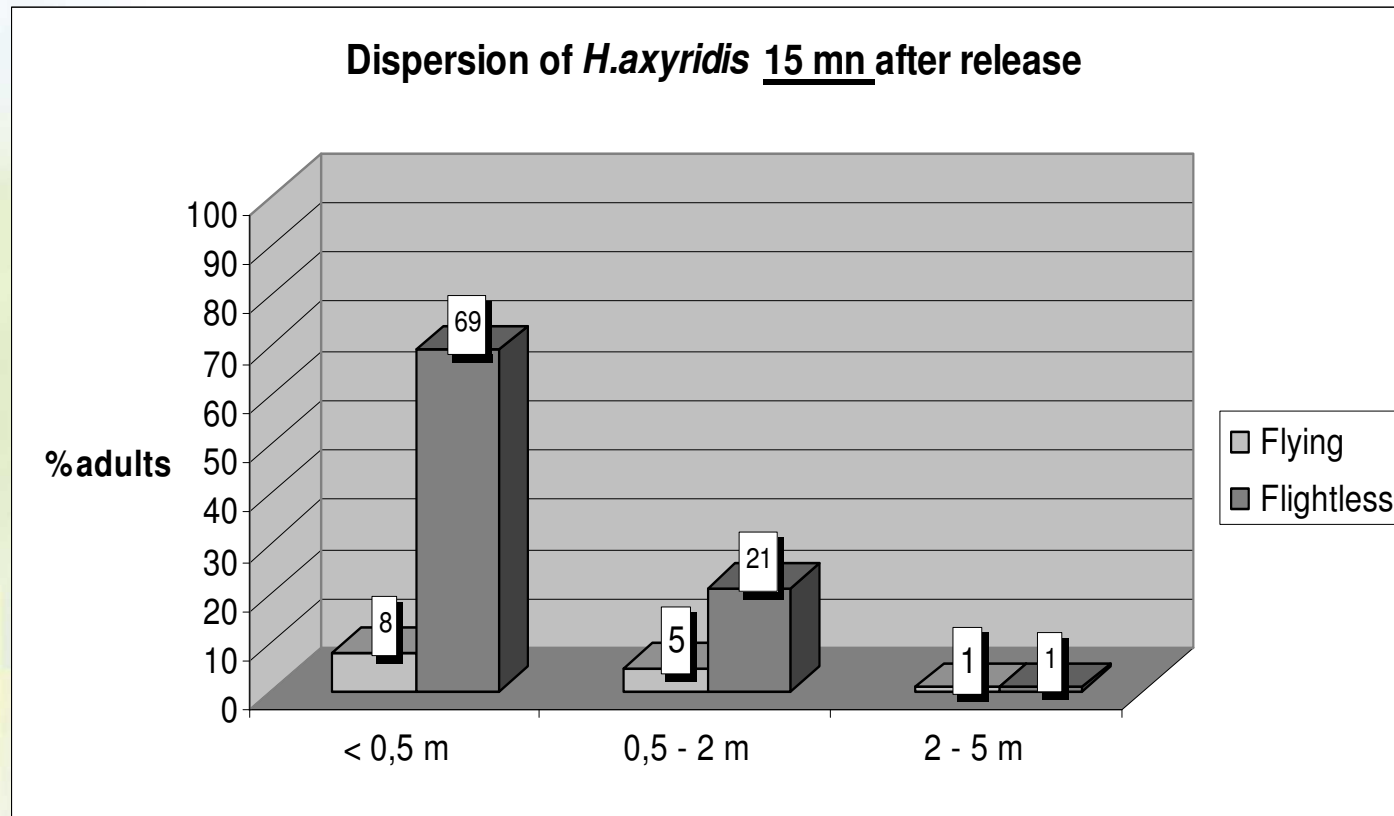


Flightless strain of *H. axyridis*



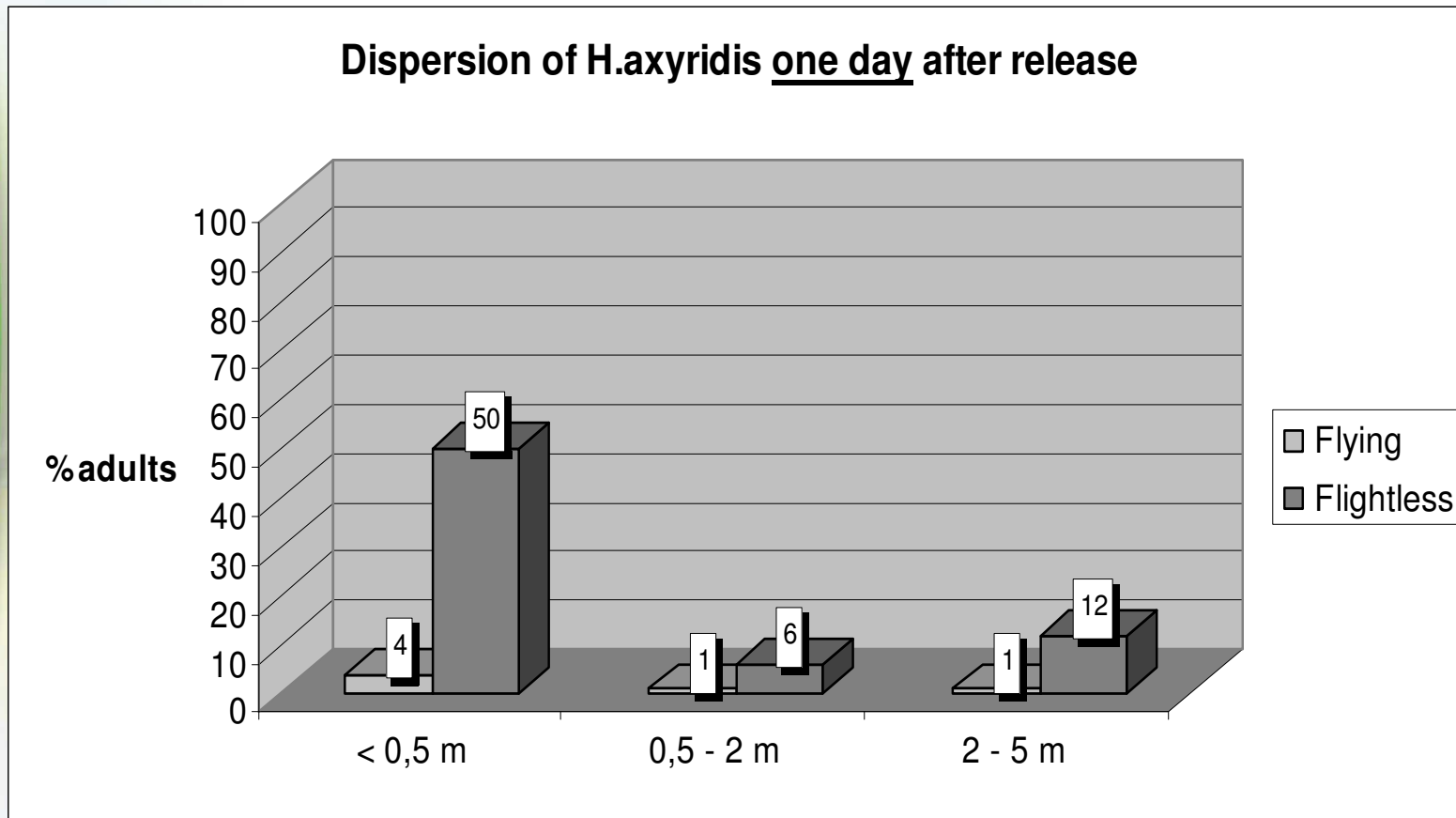


Flightless strain of *H. axyridis*





Flightless strain of *H. axyridis*





Flightless strain and negative impacts of Harmonia ?

- establishment in nature is not a negative impact (a lot of examples of classical biological control)
- pullulations could lead to negative impacts
- the flightless strain prevents reduces risks of pullulation:
 - less chance to find food far from release points,
 - less chance to find suitable overwintering places,
 - less chance for sexual maturity (specially when lack of prey ; egglay only if enough food during at least 2 weeks after hatching)
 - less chance to escape attacks of natural enemies,



Harmonia and Principle Of Precaution ?

First of all: is this concept really relevant when switching from chemicals to the use of beneficials?

However, the selection and use of the flightless strain respects this principle,

Stopping to use the flightless strain:

- will not change anything for already possible “problems” (“wild” large population already established in nature)
- will be negative for the image of the Biological Control:
 - it is not proved that it is a “mistake” of the biological control ;
 - who has an interest to suggest and enforce this idea?
and why?



Harmonia: a Problem or a Distraction ?

■ **A problem ? Yes, or may be:**

- Ladybirds not very convenient in houses,
- Could be risks in wine production,
(But other ladybirds do sometimes the same)
- Displacement or disappearing of native species ?

■ **A distraction? It should not be:**

- Some interesting questions for science
(how invasions take place, differentiation between strains,
impacts on environment, ...)
- Technical and also training interest
(at farmers, gardeners and also non users level)
- And consequences on regulation



Impact of Harmonia on the biological control activity

- Because of the Harmonia « problem » there are some « commercial » advertising against exotic ladybirds !
- The use of « commercial » indigenous/exotic argumentation is dangerous, but not only for exotic ladybirds,
- There are a lot of exotic beneficials on the market ;
Are the end-users and the general public well informed to make difference between « good / bad » exotic beneficials ?
- this kind of communication is negative for all the bio control, any new introduction of exotic beneficials will be quite more difficult, perhaps impossible.



REGULATION IN GENERAL AND SPECIFICALLY FOR POLYPHAGOUS BENEFICIALS ?

Very strange situation:

safety as the main hurdle to develop biological control ? ! !

We cannot work out of law, and if we don't want to stop the activity we have to find adapted regulation

The regulation should be built on:

- real knowledge and balance between risks and benefits, not only on fear and hypothesis,
- acceptable level of risk (zero risk is impossible),
- possibilities to support costs (market size),

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Futur of the biological control ?

The development of the biological control will depend on capacity to develop:

- products with more efficacy and lower cost,
- new solutions, for new pests,
- good and adapted « communication » about the interest and the safety of the method,

Need for:

- more knowledge (about pests, beneficials, environment, ...)
- more public/private cooperation to develop research,
- regulation facilitating this development and not increase difficulties,

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Harmonia: a Problem or a Distraction ?

- Some real « problems »
- but we have to look at:
 - available knowledges,
 - some exageration about risks? perhaps the situation is not so dark,
 - time for biology / communication
- we will need more time for explanation and positive communication: biological control (even with exotic polyphagous beneficials) is safe, at least much safer than chemicals,



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REGULATION

Adapted and
harmonized regulation

But not
harmoniAzed regulation!

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Harmonia: a Problem or a Distraction ?

- Real « problems »
 - nuisances in houses, ...
 - risk in wine production,

- Possible « problems »
 - modification and displacements in native ladybirds populations,
 - risk of extinction?

- communication « problems »



HARMONIA = LADYBIRD !

An insect with special place in a lot of civilizations :

- bête à bon Dieu,
- ladybeetle,
- marienkäfer,
- scarabée pascal,
- ...

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HARMONIA = LADYBIRD !

Very interesting for biological control, specially on hobby market (gardens)

Advantage for training and positive communication

Harmonia: a ladybird and very visible

Disadvantage if crisis communication

Now with the Harmonia « problem »

- stop the activity?
- develop positive communication and training thanks to the flightless strain?

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Regulation of biological control with beneficials

Quality Control

Not adopted (adapted) for regulation, but quite positive impacts on production and use of beneficials in biological control (code of conduct),

ERBIC

What product to develop?

Wait and see before starting new non native organism,

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- new hurdle?
- chance for better development?
- Harmonia as a bad exemple to justify restrictive regulation?
- flightless Harmonia as a model for technical solutions?

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