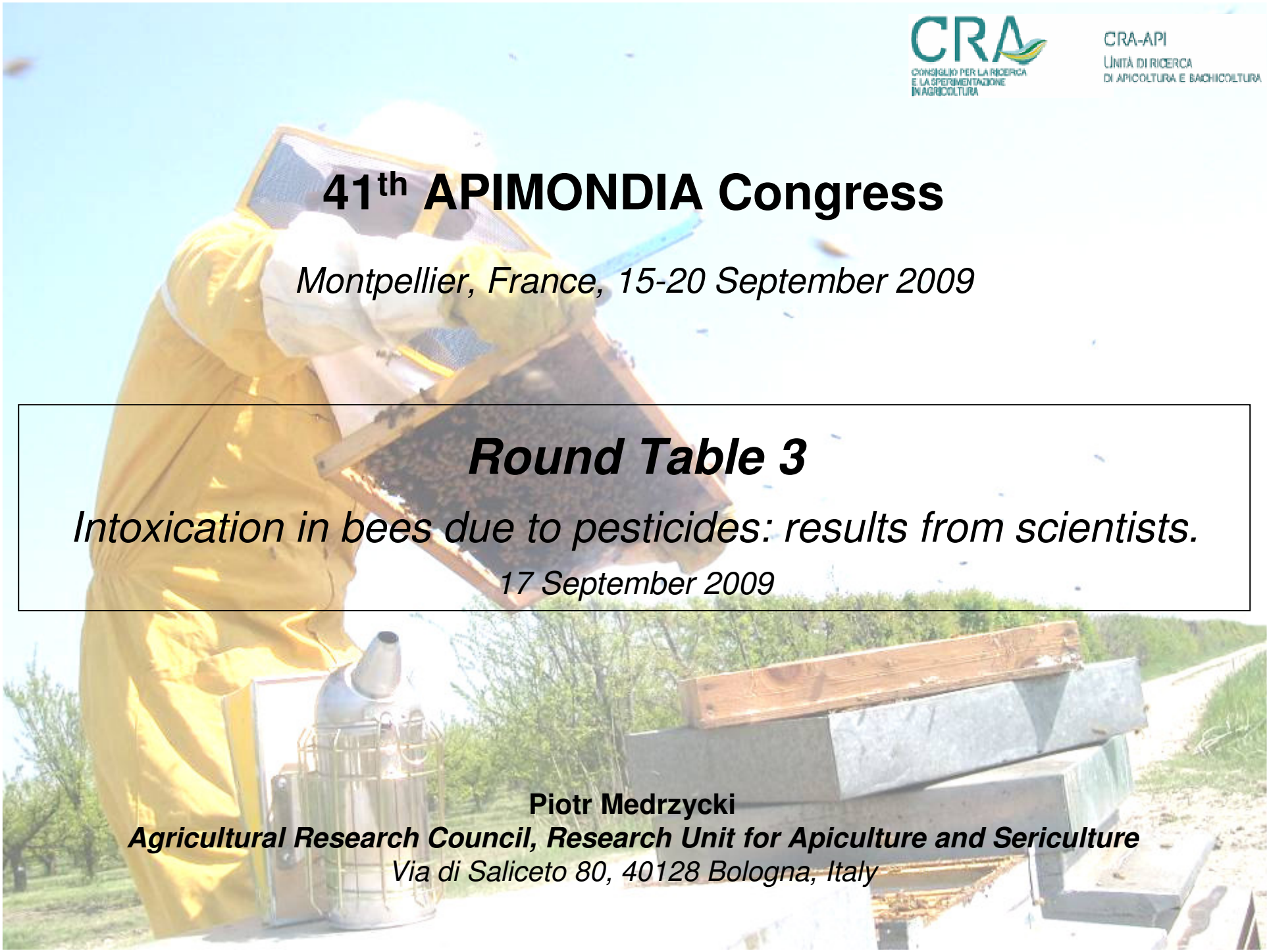


CRA
CONSIGLIO PER LA RICERCA E LA SPERIMENTAZIONE IN AGRICOLTURA

CRA-API
UNITÀ DI RICERCA DI APICOLTURA E BACHICOLTURA

41th APIMONDIA Congress

Montpellier, France, 15-20 September 2009

Round Table 3

Intoxication in bees due to pesticides: results from scientists.

17 September 2009

Piotr Medrzycki
Agricultural Research Council, Research Unit for Apiculture and Sericulture
Via di Saliceto 80, 40128 Bologna, Italy

CRA-API

Agricultural Research Council, Research Unit for Apiculture and Sericulture
Bologna, Italy; Head – DR Marco Lodesani

- Founded as INA (National Institute of Apiculture) in 1931 (public financial support)
- The main point of reference in Italy for problems and issues related to beekeeping
- Objective: promote initiatives aimed at increasing, optimising and disseminating beekeeping practices and beehive products
- 1st October 2004, INA was incorporated in CRA (Agricultural Research Council)

Activities

- Services

Analysis laboratory
Environmental monitoring
Training/Courses
Selection (Instrumental insemination)
Technical and scientific consultancy

- Research

Genetic improvement
Bee pathology
Product optimisation
Economy and market
Bees and environment

Bees and Environment

Research activity of Bee Protection Group "*Apoidea*"

- Multifactorial study of **bee loss** causes
- **Effects** (lethal and sublethal) on bees of agriculture and other environmental factors
  - **Pesticides**
  - GMO's
  - Climatic changes
  - Others
- Monitoring of **environmental pollution** with honey bees
- Study of wild pollinator **biodiversity** in different ecosystems

APENET
Analysis of bee health risk factors

Suspension for 2009 of 4 active ingredients for seed dressing (imidacloprid, clothianidin, thiamethoxam, fipronil)

*Ministry of Agriculture financed national project **APENET** for 2009-2010*

Main Objective

Give explanation about the mysterious colony losses and high bee mortalities reported in the recent years in many countries

Evaluate the efficacy of the introduced law (suspension of seed dressing) on colony losses, from the 2009 season

APENET

First results

APENET
national monitoring network

- *2009 – no abnormal mortality or bee losses linkable to maize sowing*
- *reports of high mortality occurred during maize sowing:*
  2008 – 185
  2009 – 3 (all caused by illegal use of dressed seeds)

APENET
sowing tests

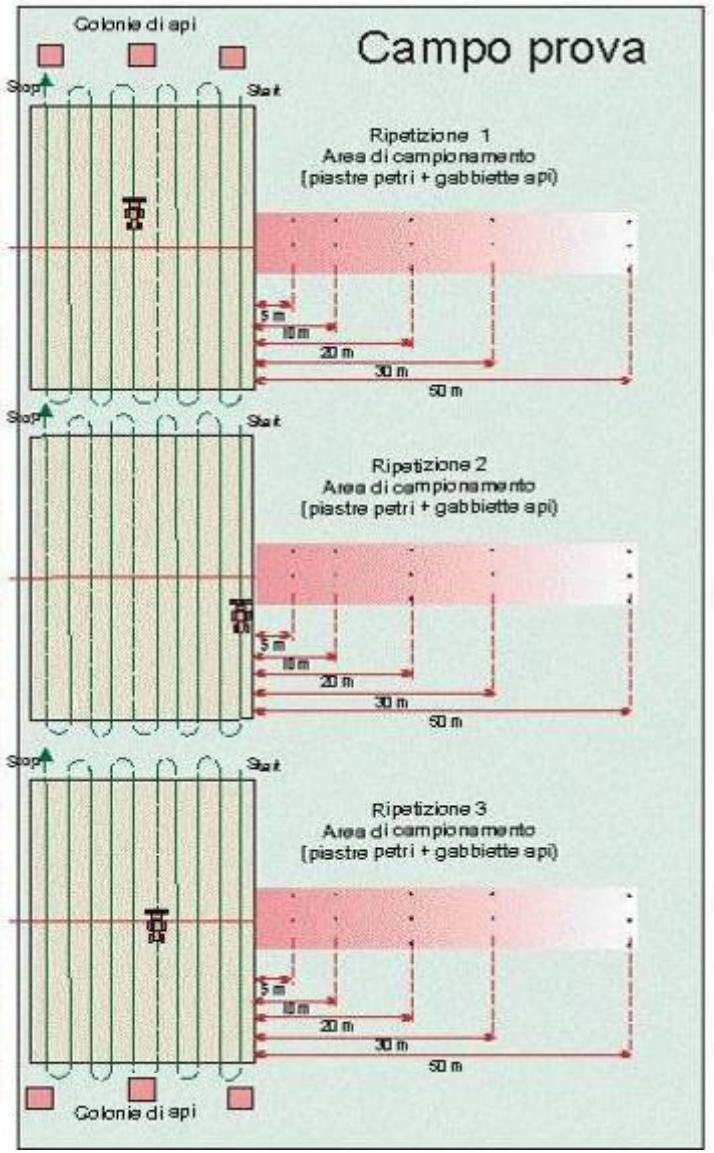
- *Dust dispersion during sowing*

  confirmed <u>dispersion</u> from the drilling machine and deposition on the ground (even new dressing method)

- *Evaluation of the drilling machine modification*

  the "dual pipe deflector" was able to reduce the dispersion by 12-47% (<u>too little</u>)

  sowing with deflector – higher dispersion at <u>longer distances</u>



APENET
sowing tests

- *Damages in bees exposed to the dust*

  negative effects on <u>colony strength</u>

APENET
laboratory tests

- *PER tests at 1/5 (clo, thi, fip) or 1/25 (imi) of LD50*

  damages on bee memory at medium (3h) and long (24h) time

APENET
laboratory tests

- *Importance of brood rearing temperature*

  brood reared at suboptimal temperature (33°C) originates low fitness bees (longevity reduced, susceptibility to intoxication increased)

  hypothesis of damages on colony level following slight bee loss in early spring

- *Toxicity tests on larvae*

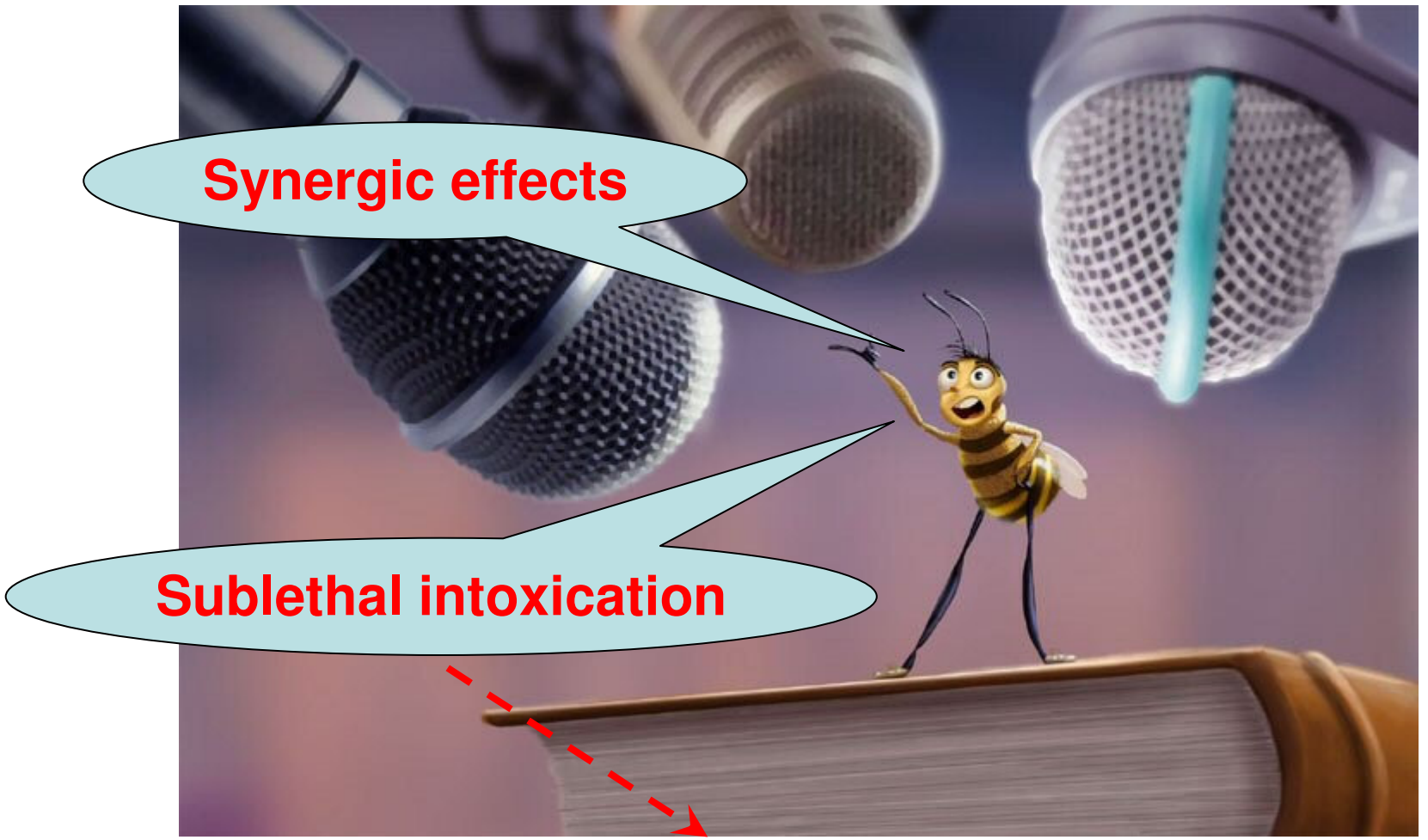
  larval toxicity of Clothianidin and Fipronil much lower than on adult bees
  LD50 (48h) clo >> 3000ng/larva
  LD50 (48h) fip = 38,9ng/larva (10 times higher than in adults)

APENET

first effect

Decree of suspension of 4 active ingredients for seed dressing
will be renewed for 2010

REMEMBER !



Bees = social insects

Sublethal effects at individual level may be lethal for the colony

Synergic effects

- ***Quality of alimentation and agrochemicals***

  type of pollen – significant effects on bee susceptibility to some stressing factors (intoxication by pesticides)

- ***Bee age, environmental temperature and agrochemicals***

  foragers – more susceptible to intoxication than younger bees

  at higher temperatures foragers are much more susceptible to intoxication by pesticides

maybe it would be useful to test toxicity at higher temperatures ?...


LET'S BEE FRIENDS
Thank you for the attention