

CONVEGNO REGIONALE

L'APICOLTURA COME PREZIOSA RISORSA PER AMBIENTE E AGRICOLTURA

6 luglio 2021 ore 15.00 – 18.00

Le api sentinelle della qualità dell'ambiente

Fabio Sgolastra

Dipartimento di Scienze e Tecnologie Agro-Alimentari

Alma Mater Studiorum Università di Bologna

fabio.sgolastra2@unibo.it

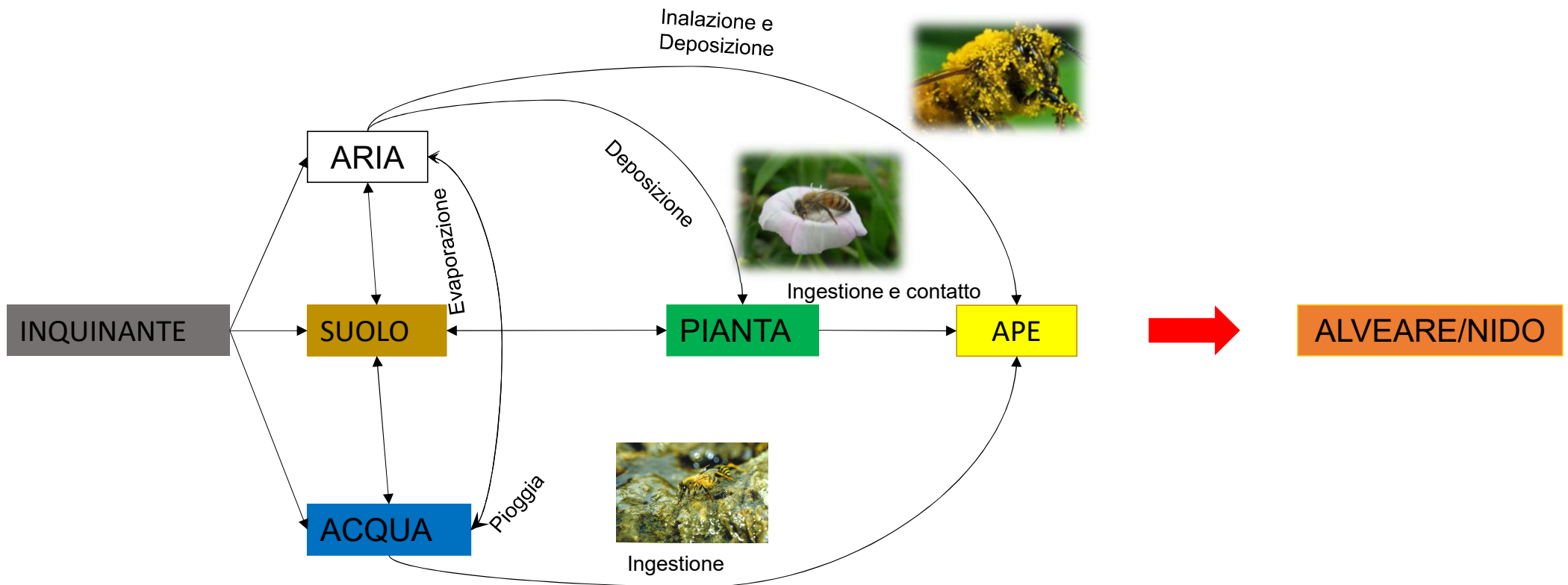
L'importanza delle api e dell'impollinazione



- L'85% delle piante coltivate dipende dal servizio di impollinazione operato dagli animali (soprattutto api) per la produzione di semi e/o frutti;
- In termini di peso, circa un terzo del cibo che ingeriamo dipende dall'impollinazione zoogama;
- Il valore economico globale dell'impollinazione zoogama è stato stimato in 153 miliardi di euro annui
- Circa il 90% delle piante selvatiche dipendono dall'impollinazione zoogama per riprodursi;



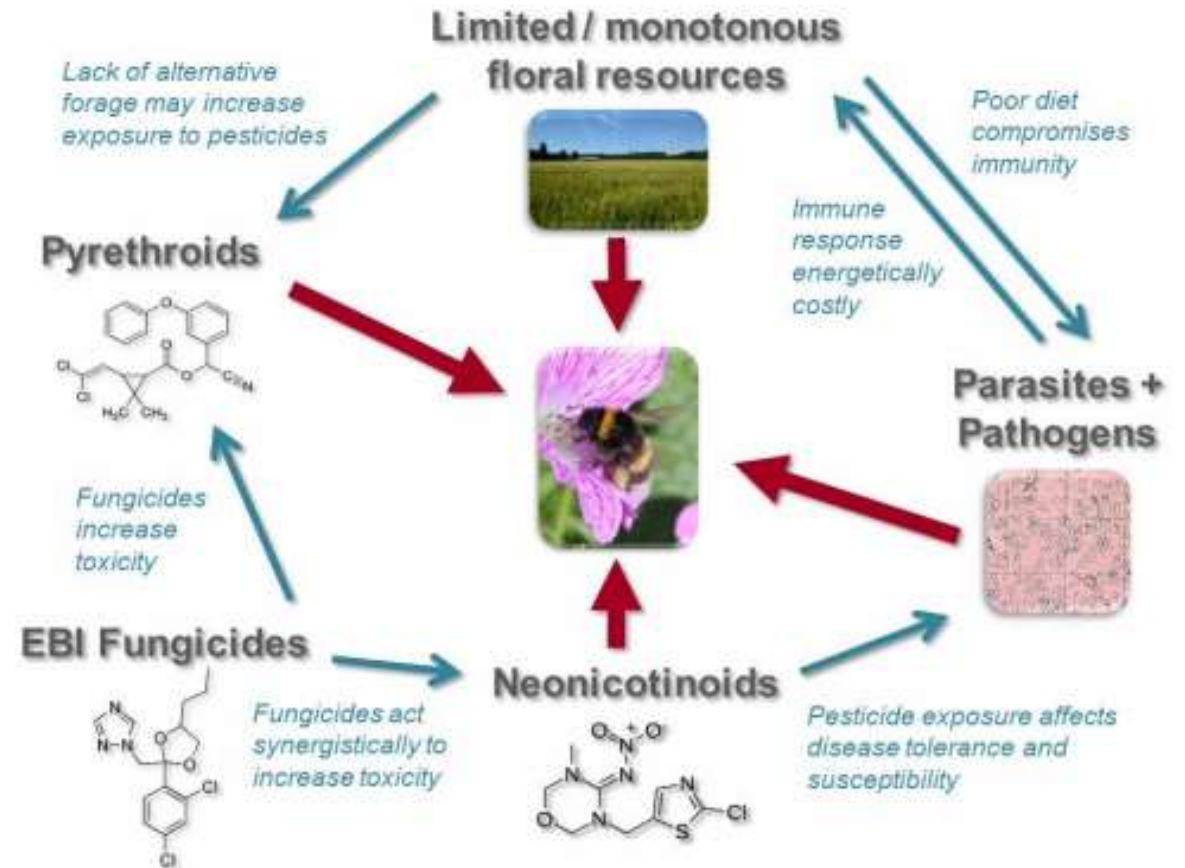
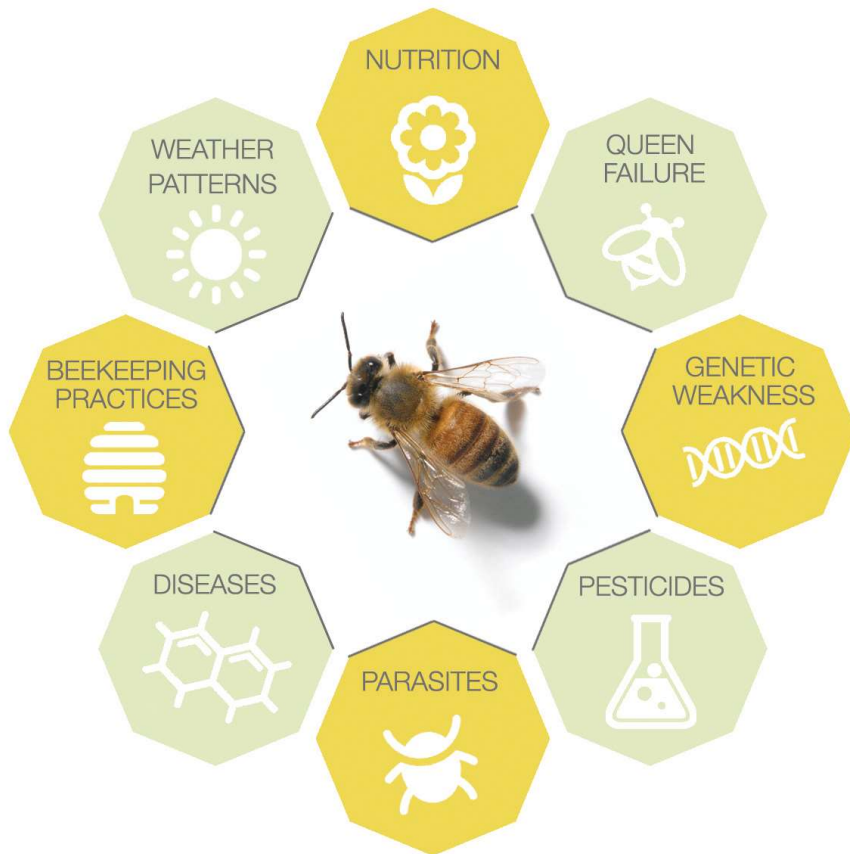
Le api come bioindicatori



Porrini et al. (2002) Use of honey bees as bioindicators of environmental pollution in Italy. In: Honey bees : estimating the environmental impact of chemicals / edited by James Devillers, Minh-Hà Pham-Delègue (Ridisegnato).

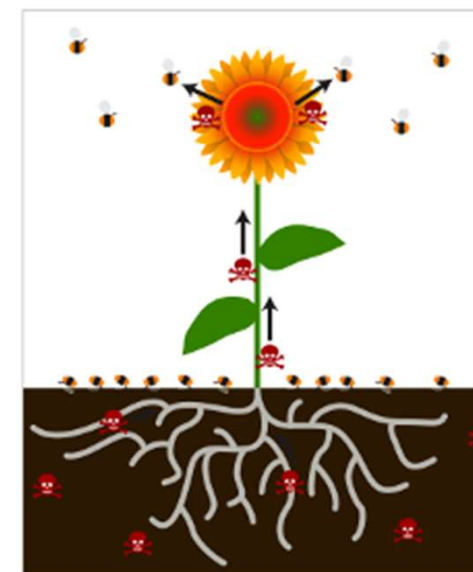
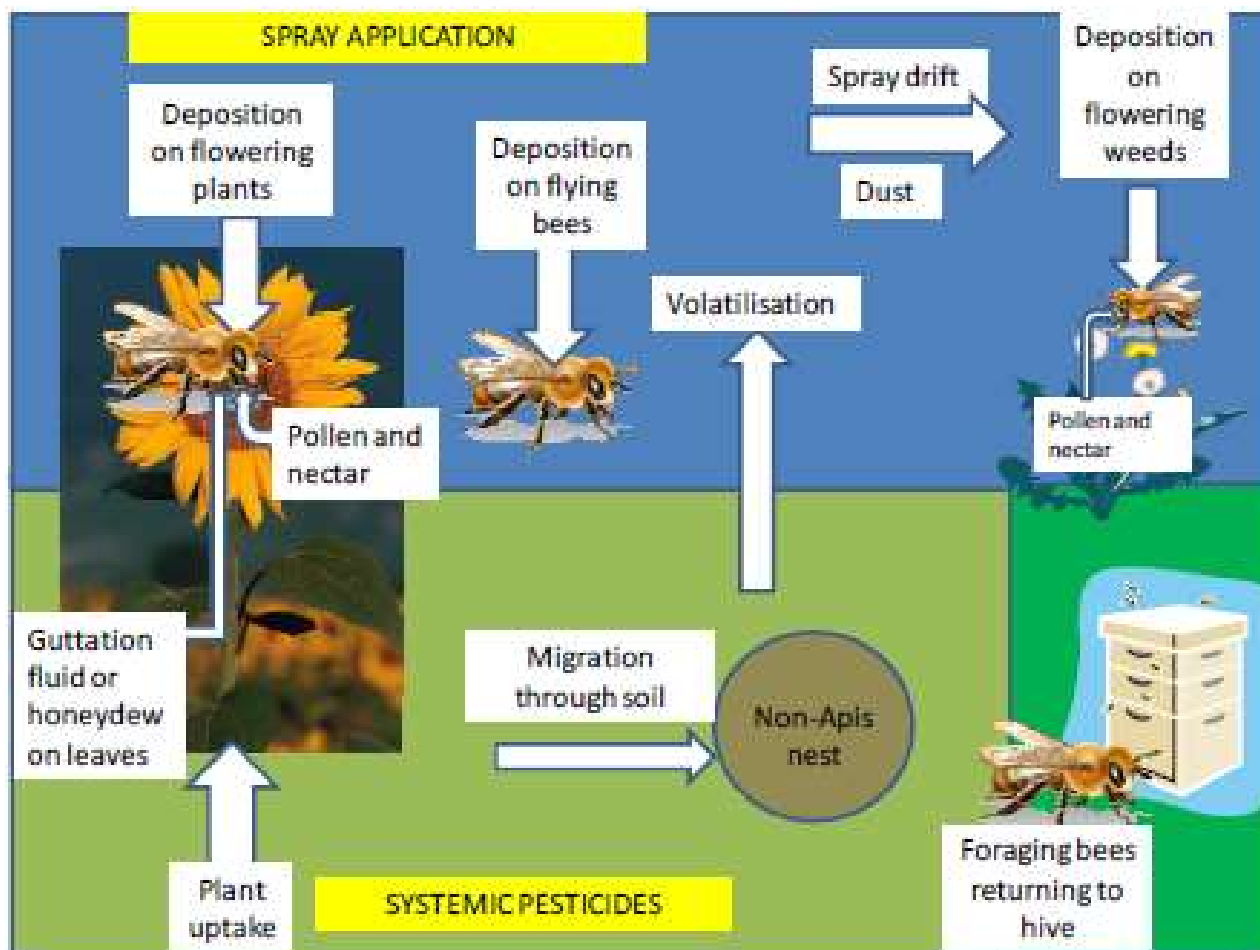
Le cause del declino delle api

Fattori di stress multipli

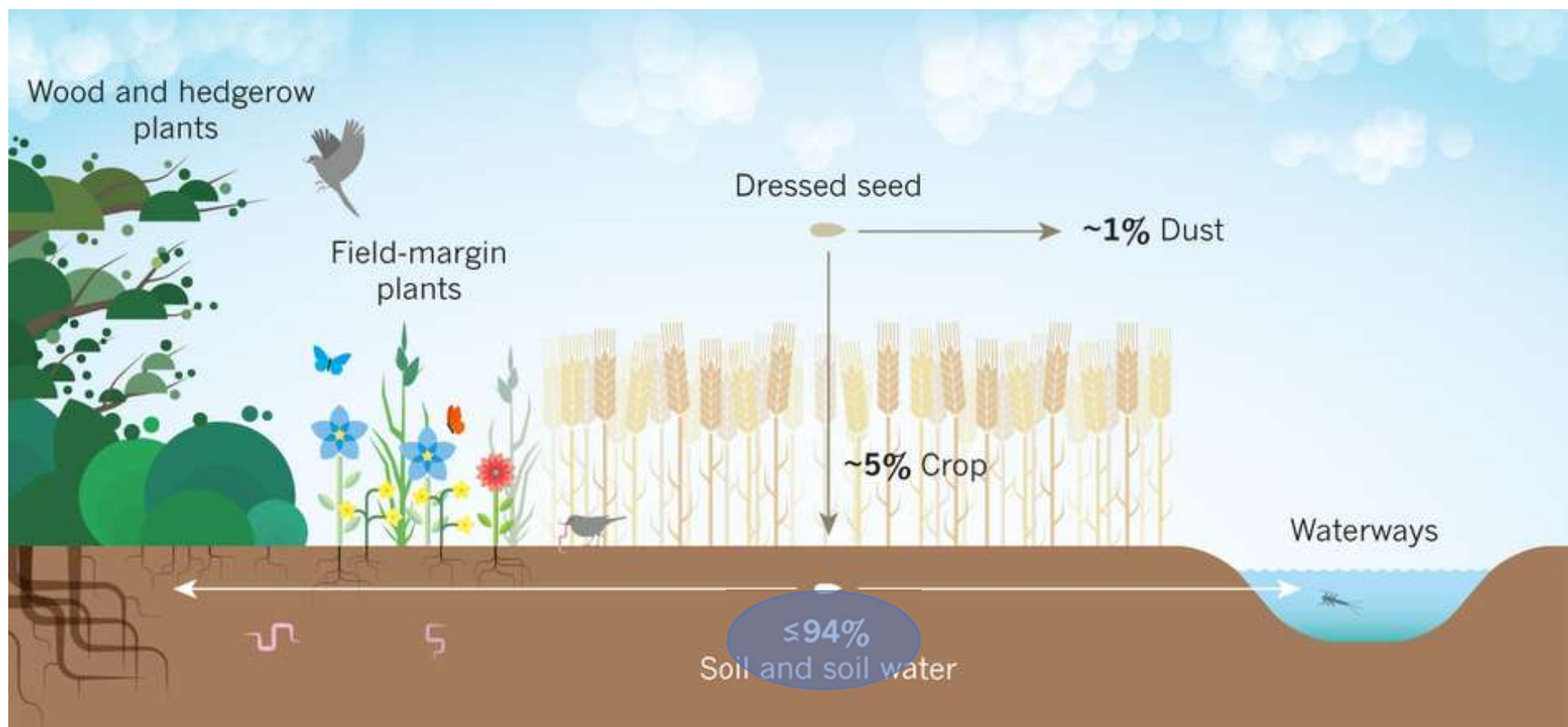


Goulson et al. 2015 *Nature*

Esposizione delle api ai pesticidi

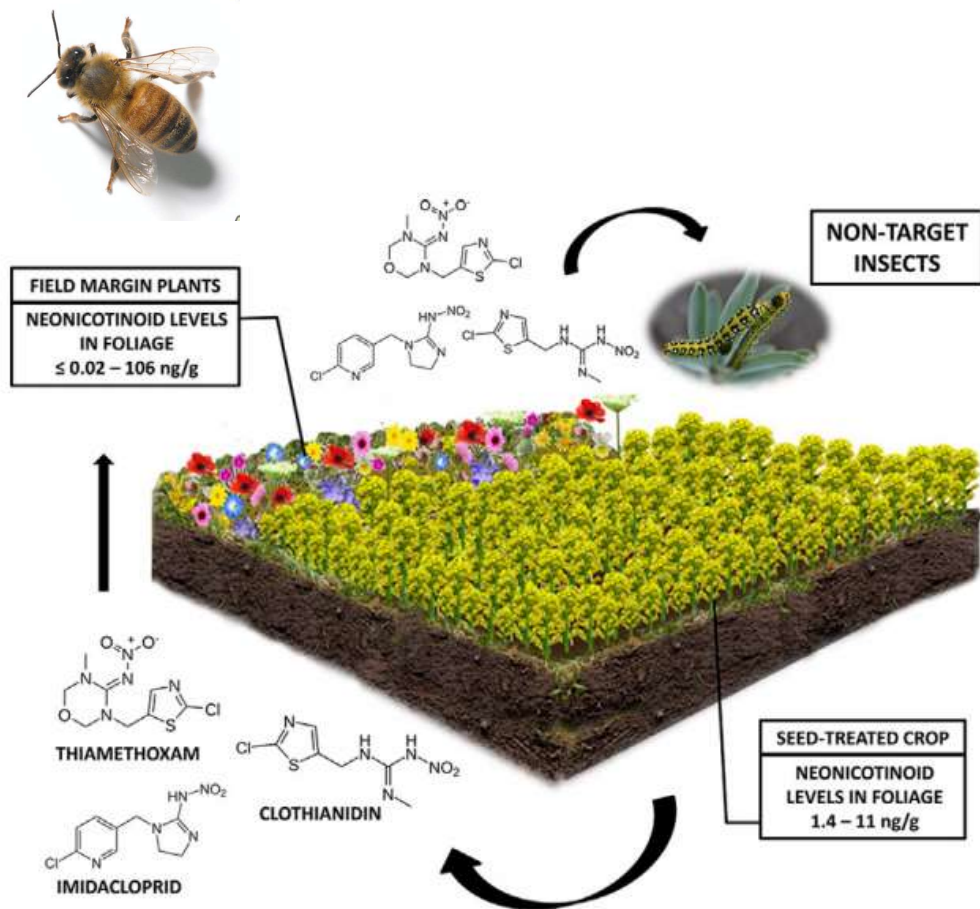


Esposizione delle api ai pesticidi

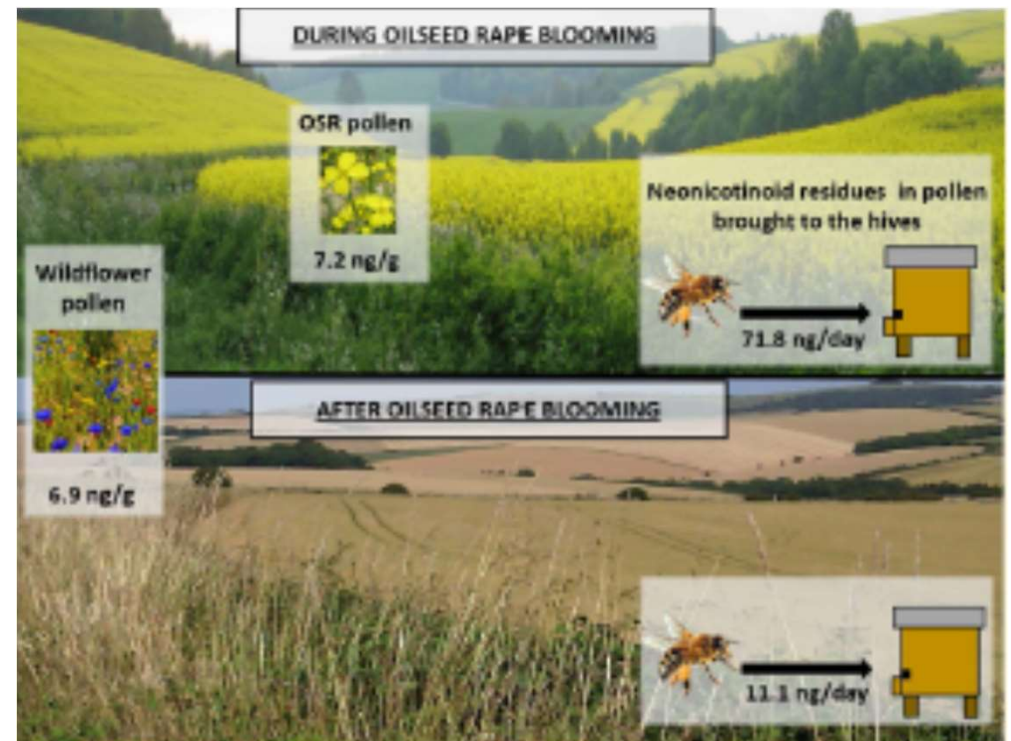


Goulson (2014). *Nature*

Esposizione delle api ai pesticidi



Botías et al. (2016) *Environ. Sci. Technol.*



Botias et al. (2015) *Environ. Sci. Technol.*

Esposizione delle api ai pesticidi

La co-esposizione a più pesticidi



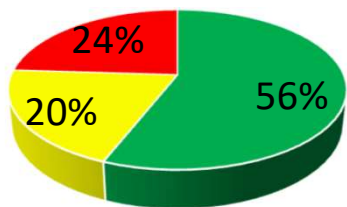
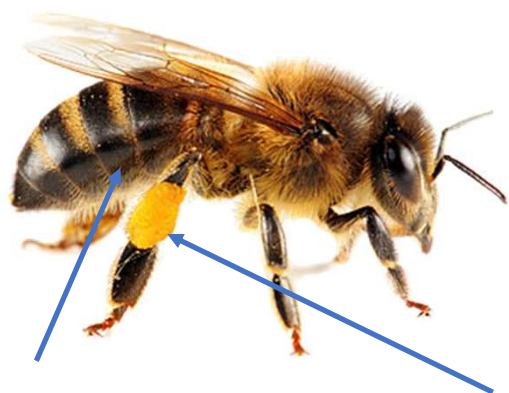
Colture trattate con diversi p.a.
(Miscele in taniche, applicazioni in sequenza)



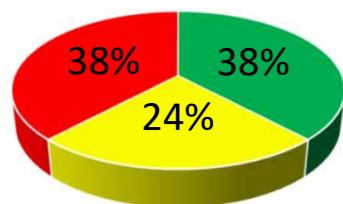
Colture diverse contaminate con diversi p.a.

Esposizione delle api ai pesticidi

Api vive

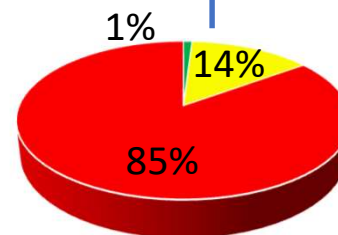


Corpo



Polline dalle corbicole

Api morte



Corpo

Percentuale di campioni con:

0 pesticidi

1 pesticidi

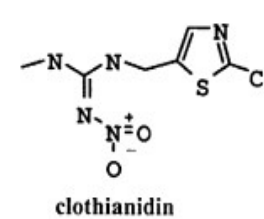
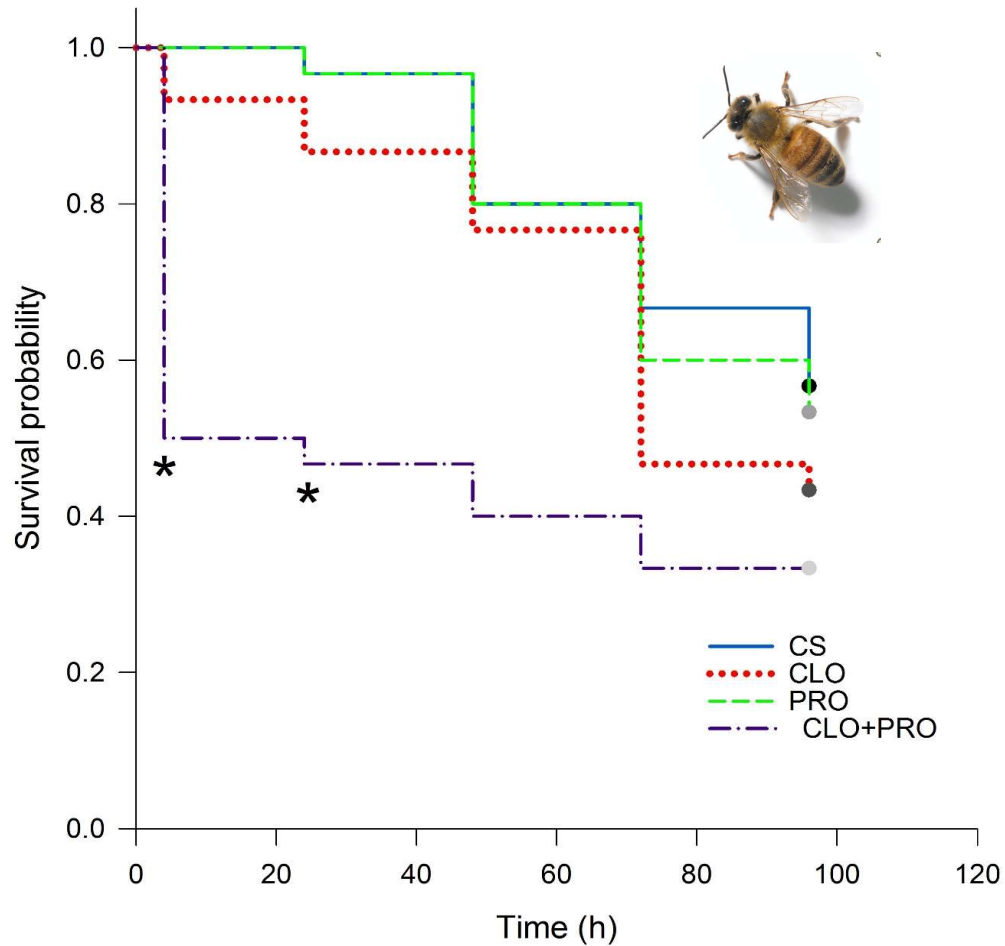
> 1 pesticidi

(Tosi et al. 2017 Sci Tot Env)

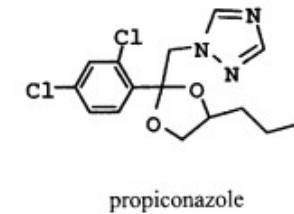
(Kiljanek et al. 2017 Chemosphere)

Effetti dei pesticidi sulle api

Effetto cocktail



Insetticida
neonicotinoide



Fungicida
IBS

Effetti dei pesticidi sulle api

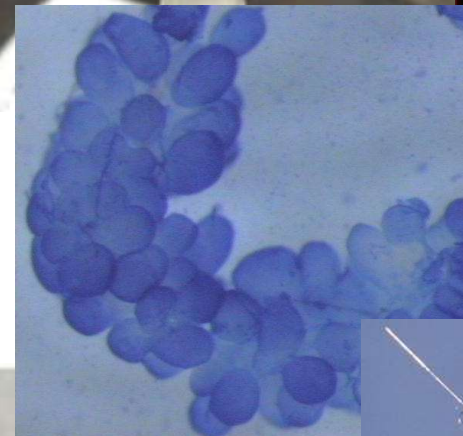
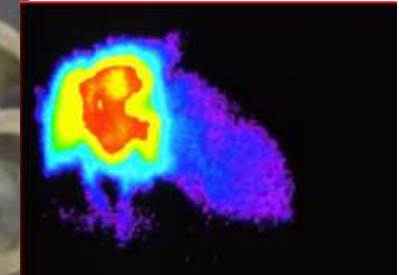
Effetti letali



Effetti dei pesticidi sulle api

Effetti subletali

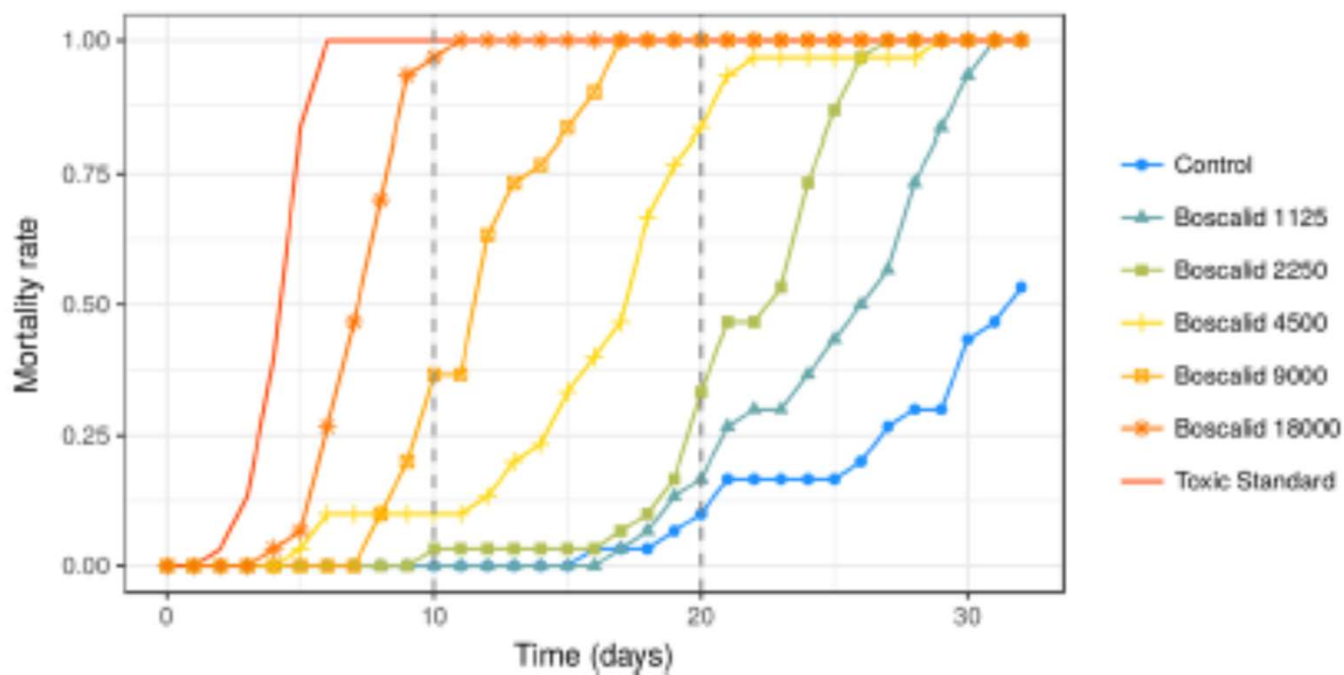
- Longevità (Rondeau et al. 2014. *Scientific Reports*);
- Sviluppo ovari (Williams et al. 2015. *Scientific Reports*);
- Termoregolazione (Tosi et al. 2016. *Journal of Insect Physiology*)
- Sviluppo ghiandole ipofaringee (Hatjina et al. 2013. *Apidologie*)
- Apprendimento (Decourtye et al. 2003. *Pest Manag Sci*)
- Orientamento (Tison et al. 2016. *Env. Sci. & Tech.*)
- Homing (Bortolotti et al. 2003. *Bulletin of Insectology*)



Effetti dei pesticidi sulle api

Effetti a lungo termine

Boscalid



Simon-Delso et al. (2018) *Scientific Reports*

Interazione cibo-pesticida nelle api



Cibo diversificato e sano



Diversità di fioriture e libere da pesticidi

Interazione cibo-pesticida nelle api

Apidologie (2016) 47:779–788
© INRA, DIB and Springer-Verlag France, 2016
DOI: 10.1007/s13592-016-0435-9

Original article

Combined effect of pollen quality and thiamethoxam on hypopharyngeal gland development and protein content in *Apis mellifera*

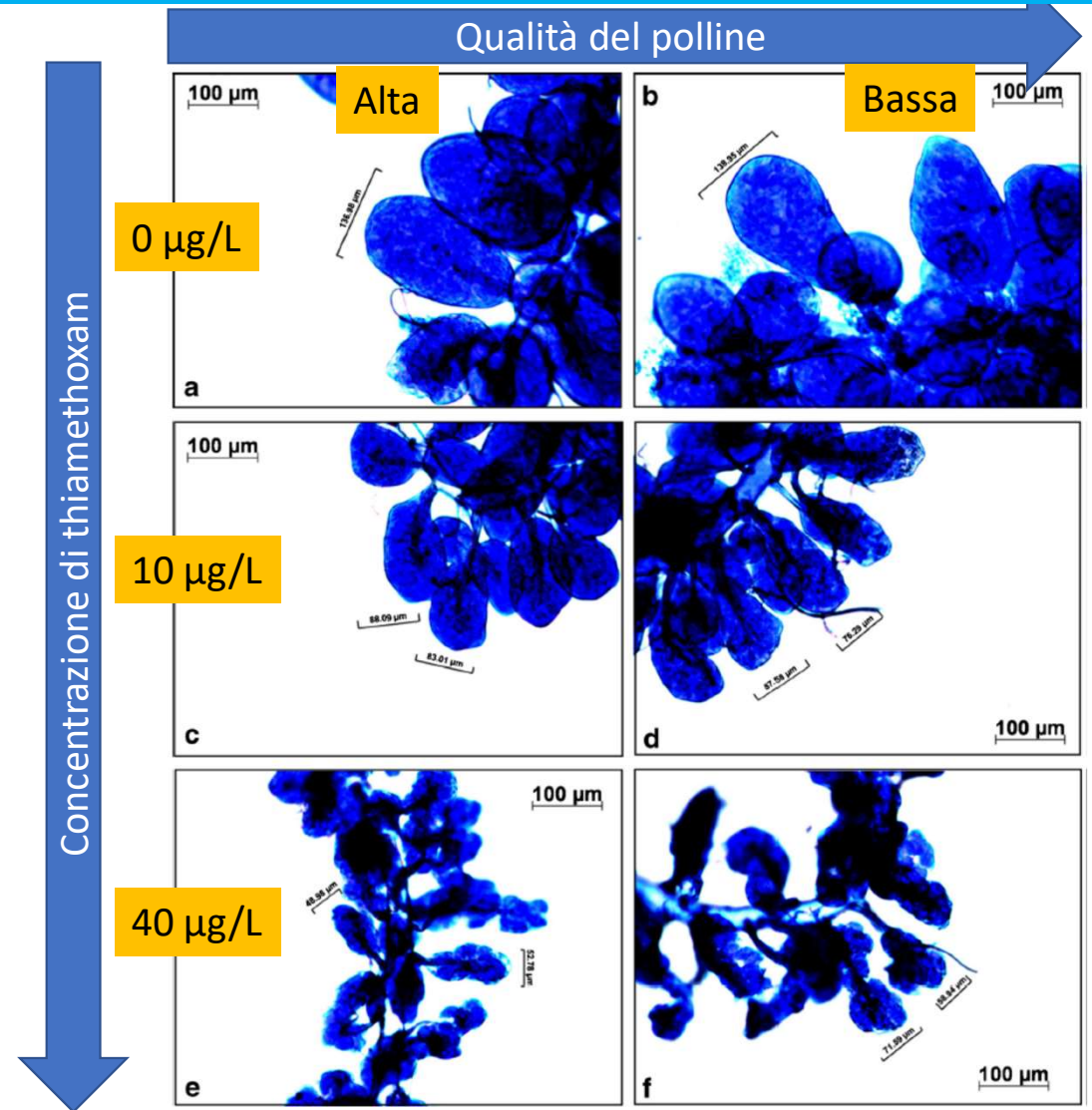
Maria Teresa RENZI¹, Neus RODRÍGUEZ-GASOL^{1,2}, Piotr MEDRZYCKI³, Claudio PORRINI¹,
Antonio MARTINI¹, Giovanni BURGIO¹, Stefano MAINI¹, Fabio SGOLA STRA¹

¹Department of Agricultural Sciences, University of Bologna, Viale Fanin 42, 40127, Bologna, Italy

²IRTA, PCITL, Parc de Gardeny, Edifici Fruitcentre, 25003, Lleida, Spain

³Honey Bee and Silkworm Research Unit, CREA-API, Council for Agricultural Research and Economics, Via di Saliceto 80, 40128, Bologna, Italy

Received 30 September 2015 – Revised 12 January 2016 – Accepted 4 February 2016



Da'IPM a'IPPM

Key Figure

Systematic Framework for Integrated Pest and Pollinator Management (IPPM)

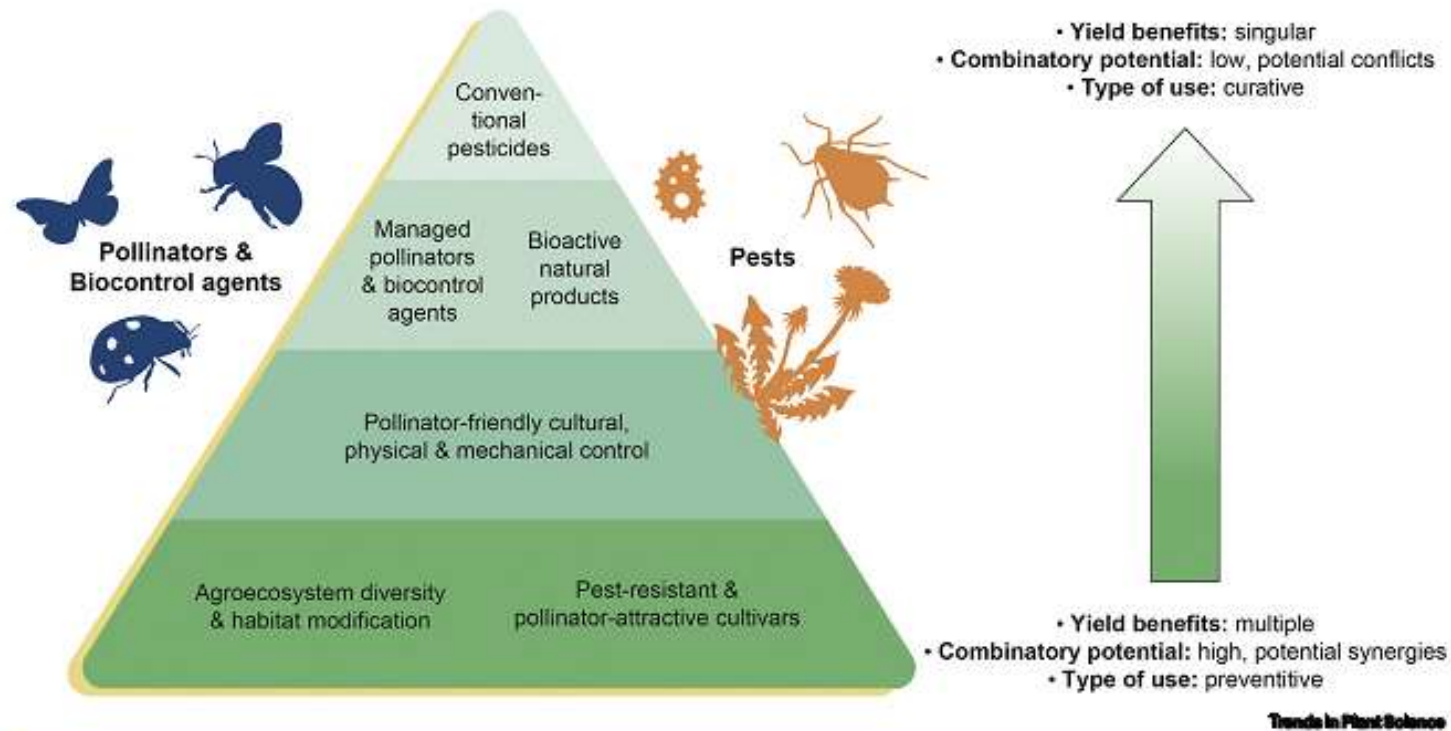
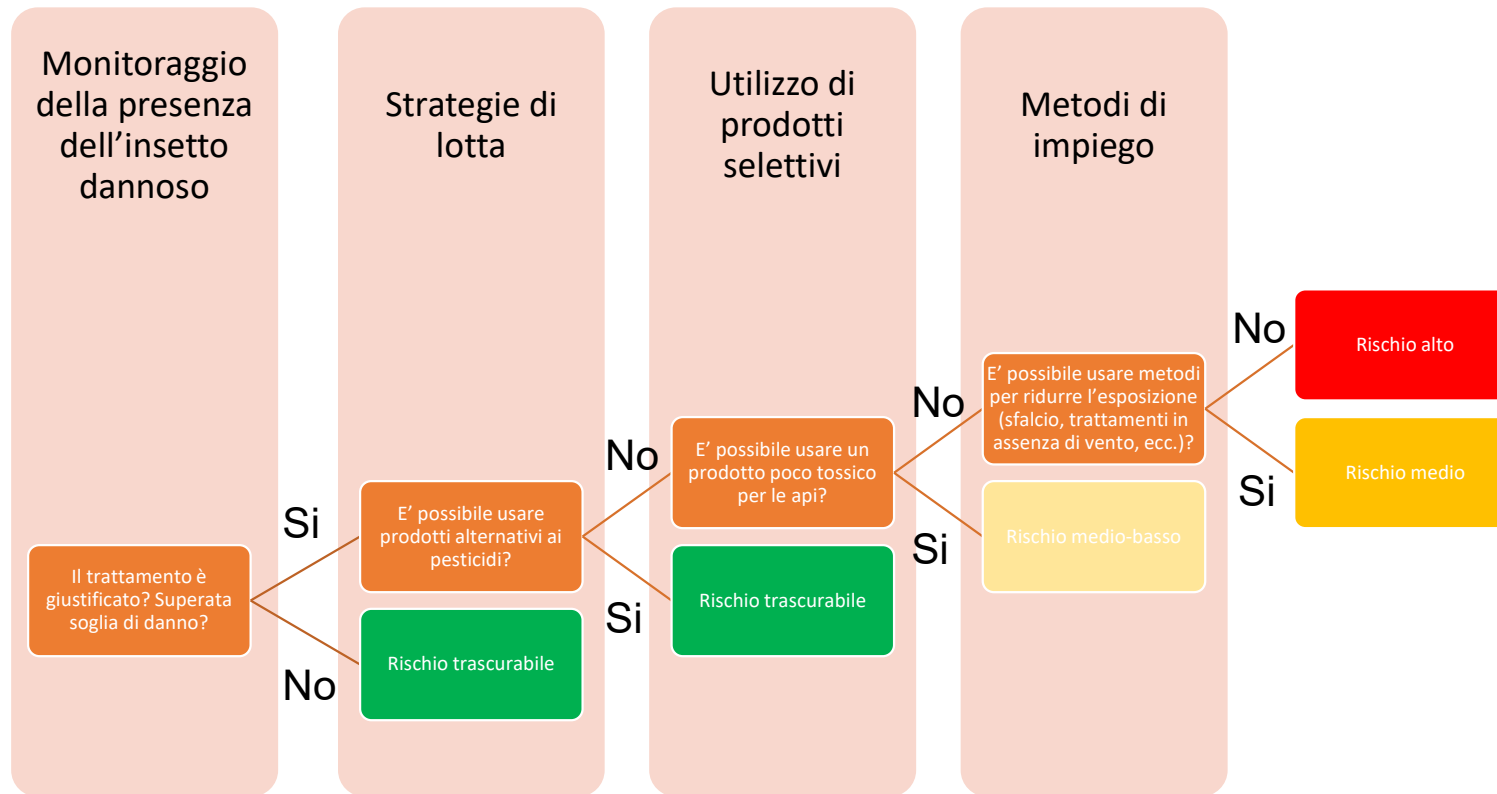


Figure 1. The framework of IPPM seeks to balance the management of pest insects, weeds, and diseases with that of pollinators and crop pollination. The placement of actions within the IPPM hierarchy is based first on their potential to facilitate dual benefits for pollination and pest control, alone or when used in combination with other actions, relative to their potential to show conflicts, and second in relation to whether they are usually applied in a manner to prevent yield gaps occurring (e.g., promotion of wild beneficial organisms), rather than in a curative manner (e.g., application of managed beneficial organisms) once action threshold is already surpassed. Thus, foundational actions in the IPPM framework (darker colours) provide a generally more favourable basis for the long-term prevention of pest- and pollinator-imposed yield gaps than lower-priority actions towards the tip (lighter colours), which should ideally see more sparing use.

Dall'IPM all'IPPM



Dall'IPM all'IPPM

Scelta dei prodotti fitosanitari da usare



TOSSICITÀ ■ ALTA ■ MEDIA ■ BASSA

SOSTANZA ATTIVA	AZIONE	DL ₅₀ TOPICA/INGESTIONE (µg/APE)		
		<i>Apis mellifera</i>	<i>Bombus terrestris</i>	<i>Osmia spp.</i>
Abamectina ^{1,2}	insetticida, acaricida	0,001	0,07	
Acetamiprid ^{1,2}	insetticida	8,09	22,2	1,72
Acido gibberellico	erbicida, regolatore di crescita delle piante	>25		
Aclonifen	Erbicida	>100		
Acrinatrina	insetticida, acaricida	0,077		
Alfa-cipermetrina	insetticida	0,033	>0,29	0,25
Ametoctradina	fungicida	>100		
Amidosulfuron	erbicida	>100	>100	
Aminopiridid	erbicida	>3,13		
Amisulbrom	fungicida	>100		
Azadiractina	insetticida, fungicida, acaricida	8,1		
Azimsulfuron	erbicida	>25		
Azoxystrobin	fungicida	>25		
Bacillus amyloliquefaciens FZB24	fungicida	>6000 CFU/ape*		
Bacillus amyloliquefaciens MBI 600	fungicida	>100 CFU/ape*		
Bacillus amyloliquefaciens subs. plantarum	fungicida	>320 CFU/ape*		

<https://www.informamiele.it/pubblicate-le-tabelle-tossicita-delle-sostanze-attive-impiegate-in-agricoltura-nei-confronti-delle-api.html>

L'apicoltura intensiva


- Mantenere famiglie forti dal punto di vista sanitario;
- Evitare l'uso di prodotti chimici per la lotta alla varroa;
- Non saturare l'ambiente con un numero eccessivo di alveari

Pesticide	Class*	2009 (%)			2010 (%)			2012 (%)	2013 (%)	2014 (%)
		Api	Cera	Pane d'api	Api	Cera	Pane d'api	Pane d'api	Pane d'api	Pane d'api
Acrinathrine*	PYR	1.5	6.0	10.0	3.7	8.6	5.1	1.9	5.7	8.2
Chlorfenvinphos*	OP	1.5	18.1	3.3	3.7	9.5	5.1	28.8	37.7	32.8
Coumaphos*	OP	16.2	31.2	28.3	7.4	28.1	14.4	11.5	0	42.6
Fluvalinate	PYR	14.7	29.6	15.0	18.5	39.5	27.1	28.8	62.3	31.1

*Non consentiti

Se le api stanno bene lo stiamo anche noi e
l'ambiente che ci circonda!





Grazie per l'attenzione

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