NEW FINDINGS ON BEES, CROP POLLINATION AND ENVIRONMENT

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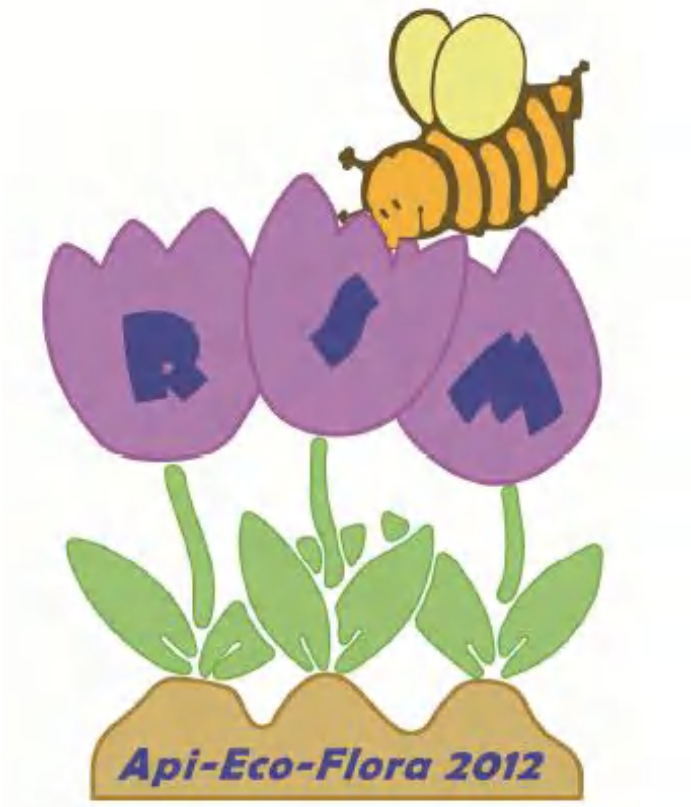
TWO THINGS FIRST :

80 POSTERS on display today
on bees, pollination, bee flora

Please fill in the SURVEY !

1st ApiEcoFlora Symposium

Republic of San Marino
4th - 6th October 2012



Symposium aim

ApiEcoFlora aims at exploring avenues for improving the dialogue between researchers, beekeepers and plant breeders by reporting on the most recent studies and advances in the areas of bees, environment and identifying the main challenges for sustainable beekeeping, crop production and plant breeding.

The main topics of **ApiEcoFlora** will include:

- Drivers of change in pollinator populations;
- Pollinator-plant interactions in changing landscapes;
- Use of wild and managed pollinators in agriculture and orticulture;
- Towards sustainable beekeeping and honey production.

For each main topic there will be a dedicated working session and ensuing open debate meetings.

www.apiecoflora.com

Environment, pollinators and pollination

Decision-Making (Policy Economics)

pressures

Pollinator-plant communities

Pollination Services & Honey production

Value of products

Environment, pollinators and pollination

Decision-Making (Policy Economics)

A

pressures

Pollinator-plant communities

B

Pollination Services & Honey production

C

Value of products

D

A How environment affects bees

B Bees as food producers

C Bees making money

D How we can help bees

A How environment affects bees

This session :

Herbert: Agro-chemicals affect learning

Magalhaes: Heavy metals and bees

Medan: Do honeybees affect wild bees?

Yesterday :

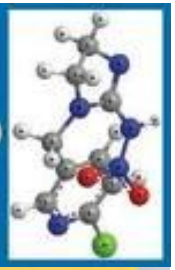
Bee Flora changes

Nectar flow changes

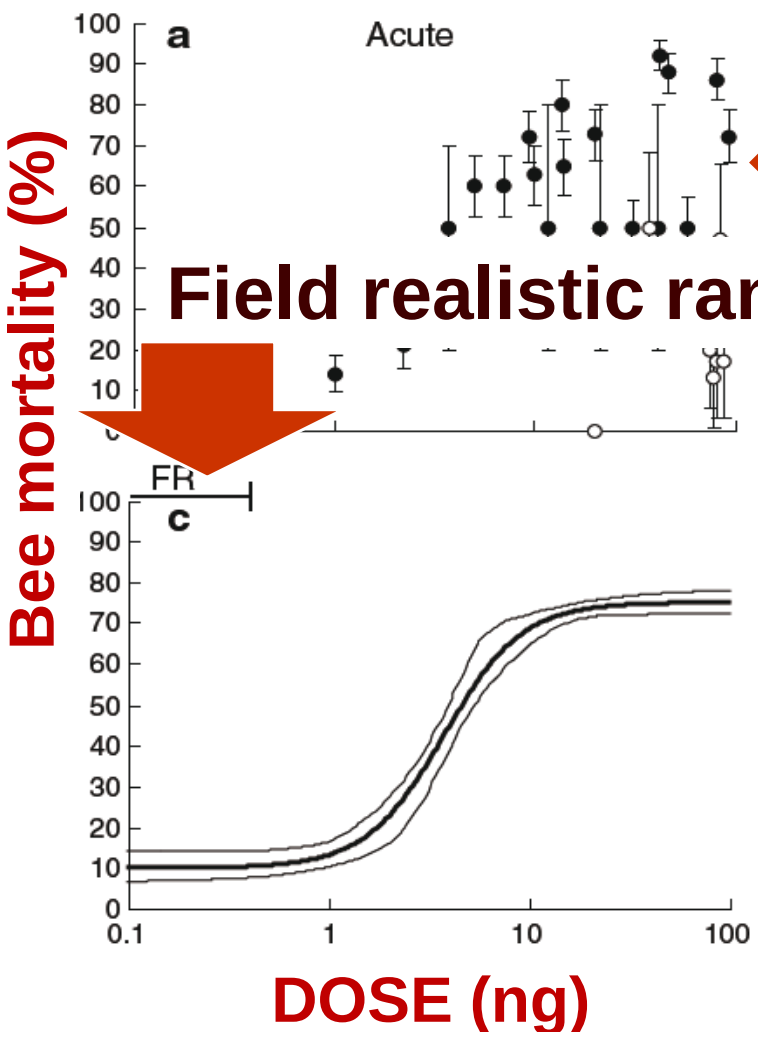
A

How environment affects bees

IMIDACLOPRID



Meta-analysis by James Cresswell (UK)



All studies compared

Field realistic range

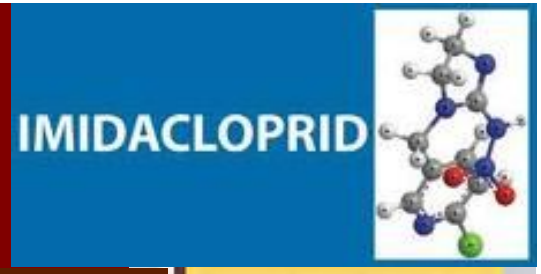
At 1.5ng: mortality goes up

At 10ng 75% of bees dead

Ecotoxicology (2010) 20:149-157

A

How environment affects bees



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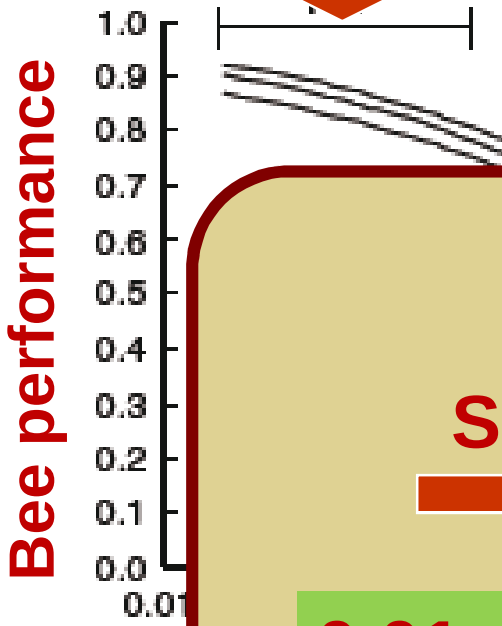
Field realistic range

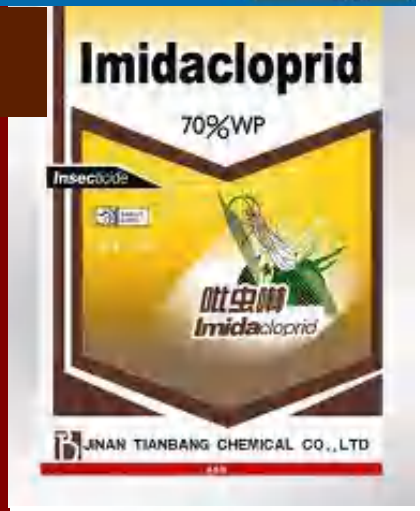


Curve from all studies pooled

Mortality

Sublethal effects

0.01 – 0.1 – 1 – 10 – 100 ng



Ecotoxicology (2010) 20:149-157

B

Bees as food producers

Bees making money

C

This session :

Imperatriz-Fonseca: Stingless bee pollinators

Aizen : Global pollination crisis ?!

Azzu FAO Pollination project

Yesterday : Eggplant, apple pollination
pollination in Korea

Tomorrow : Stingless bee symposium !

Cervancia: stingless bees and pollination

All about Honey Money: Economy plenary

B

Bees as food producers

Bees making money

C

72% of crop pl… …d pollination

35% of human fo… …for pollination

KLEIN et al. 2009

Total v… …vice:

GALLAI et al. 2009

H…

Potts et al. unpubl.

B

Bees as food producers

Bees making money

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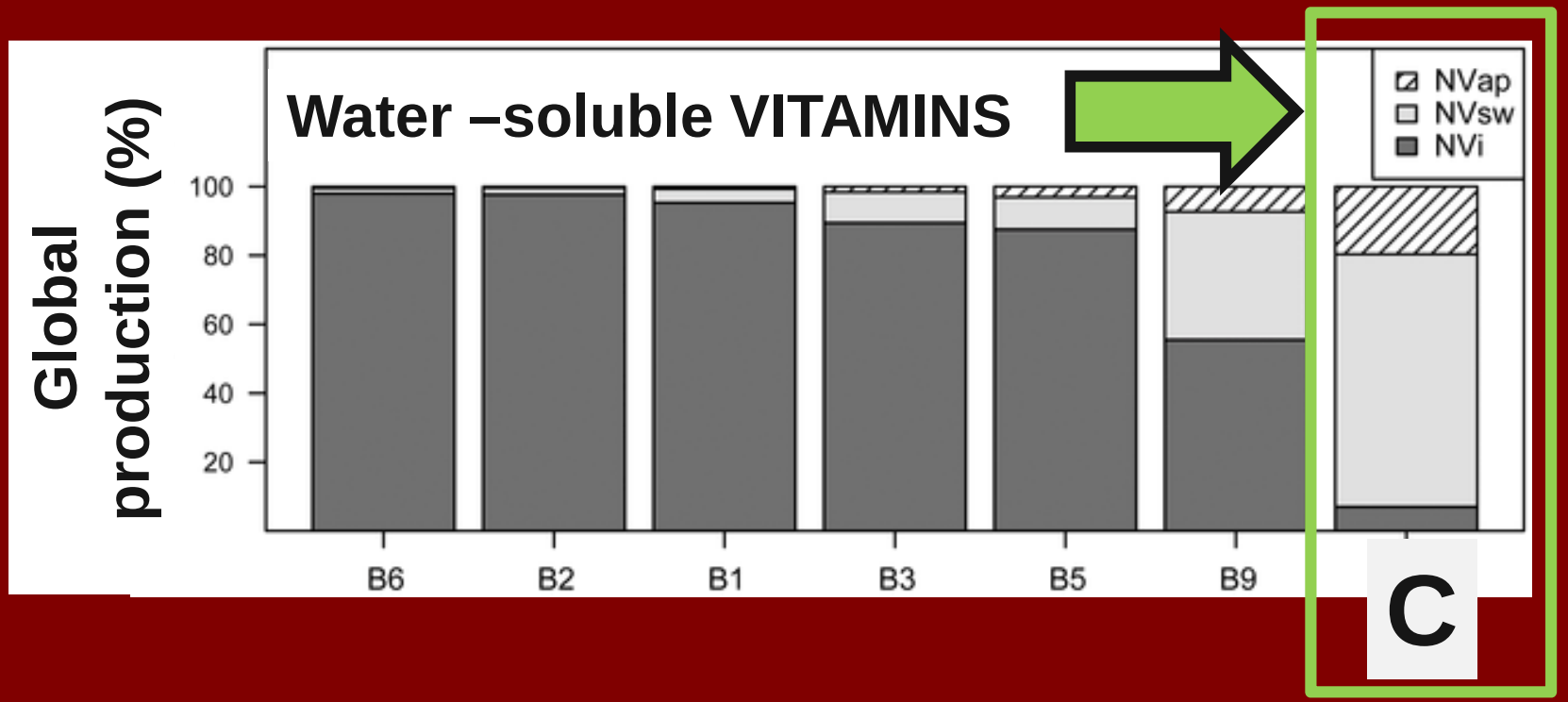
Meta-analysis by Eileen Eilers et al.

Do animal-pollinated crop provide unique diet elements compared to pollinator-independent crops?



Eilers et al. 2011 PLoS ONE 6(6): e21363

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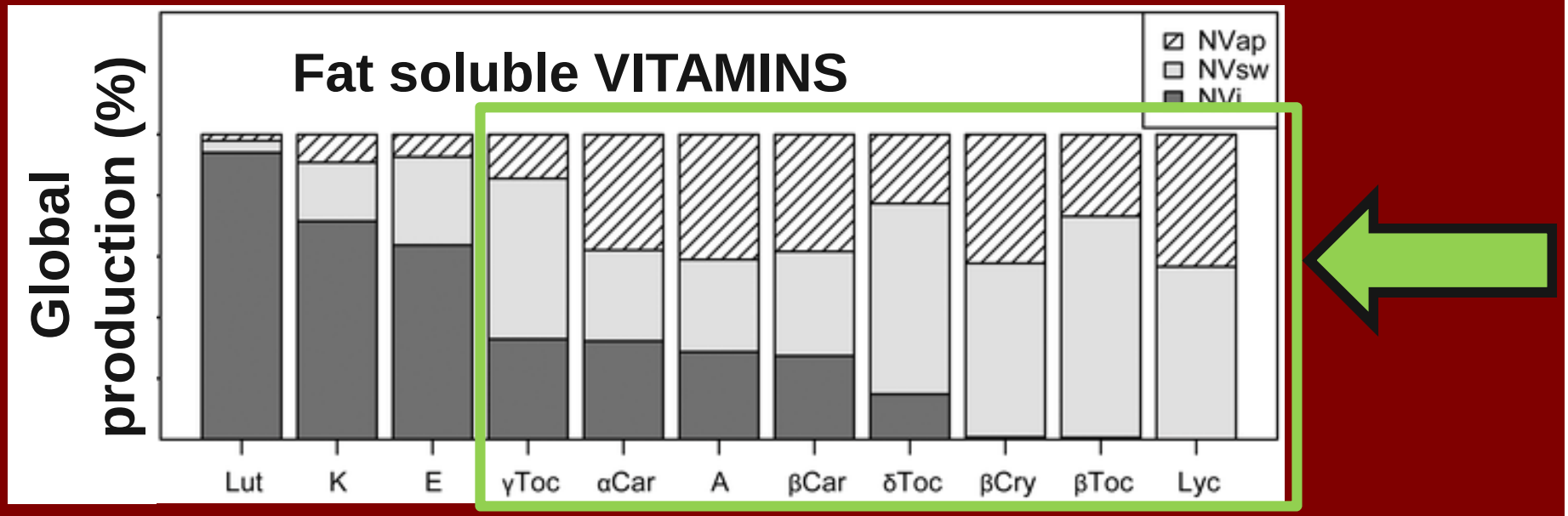


Vitamin A, β Tocopherol, Lycopene

Eilers et al. 2011 PLoS ONE 6(6): e21363

B

Bees as food producers

Bees making money

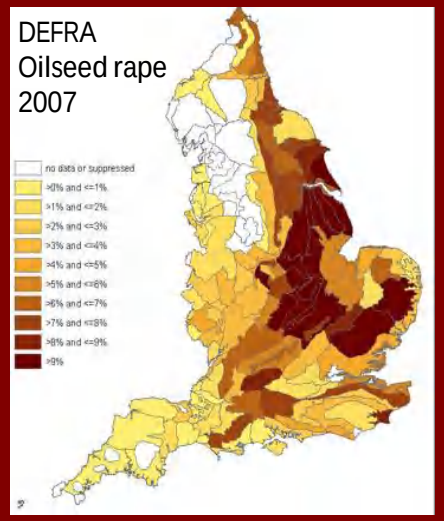
C

Study by Tom Breeze et al. (UK)

DO WE HAVE SUFFICIENT HIVES IN THE UK?

HIVE DENSITY RECOMMENDED

CROP TYPE



CROP AREA

Breeze et al. 2011 Agriculture, Ecosystems and Environment 142 (2011) 137– 143

B

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Bees making money

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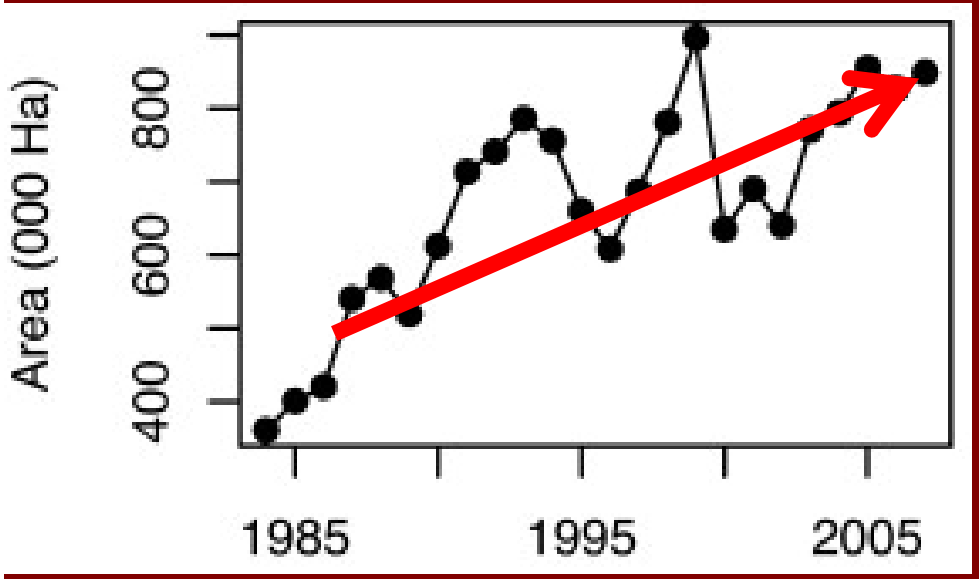
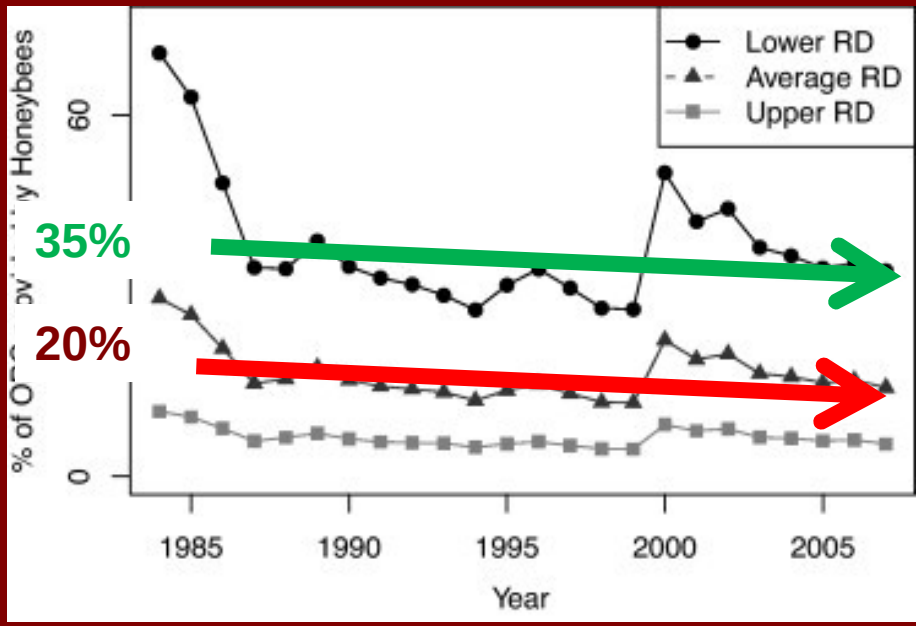
DO WE HAVE SUFFICIENT HIVES IN THE UK?

INSECT-POLLINATED CROPS



What honeybees can pollinate



Breeze et al. 2011 Agriculture, Ecosystems and Environment 142 (2011) 137– 143

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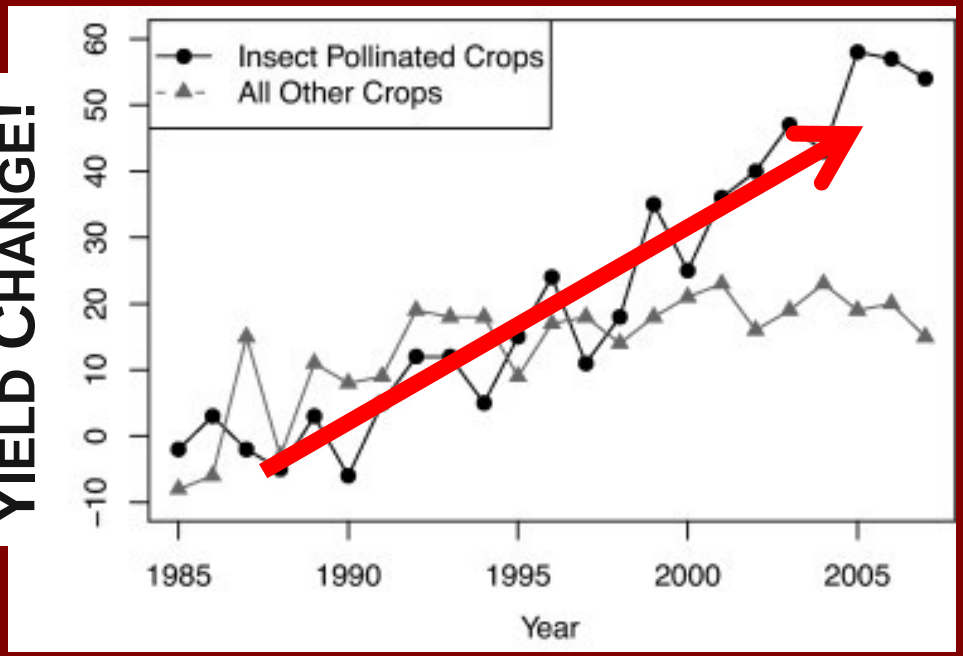
DO WE HAVE SUFFICIENT HIVES IN THE UK?

BUT …YIELD INCREASING !



Honeybees decline no problem for yield in UK

Other pollinators might provide pollination

Conserve and managed both wild pollinators and managed bees

Breeze et al. 2011 Agriculture, Ecosystems and Environment 142 (2011) 137– 143

D How we can help bees

This session :

Imperatriz-Fonseca: Bee management

Azzu: Integrated Pollinator management

Roberts: Red Lists for pollinators

Yesterday :

Natacha Chacoff: conservation for pollination

Tomorrow : **Stingless bee symposium !**

D

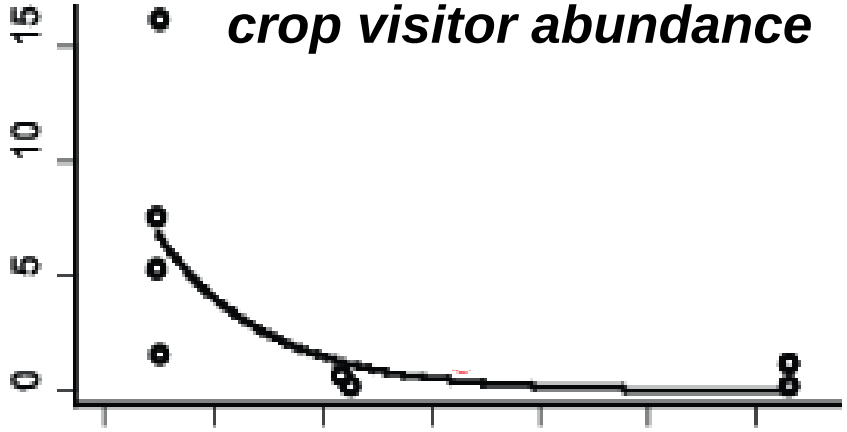
How we can help bees

Study by Luisa Carvalheiro et al. 2011

Can weeds in crops improve pollinators and pollination?

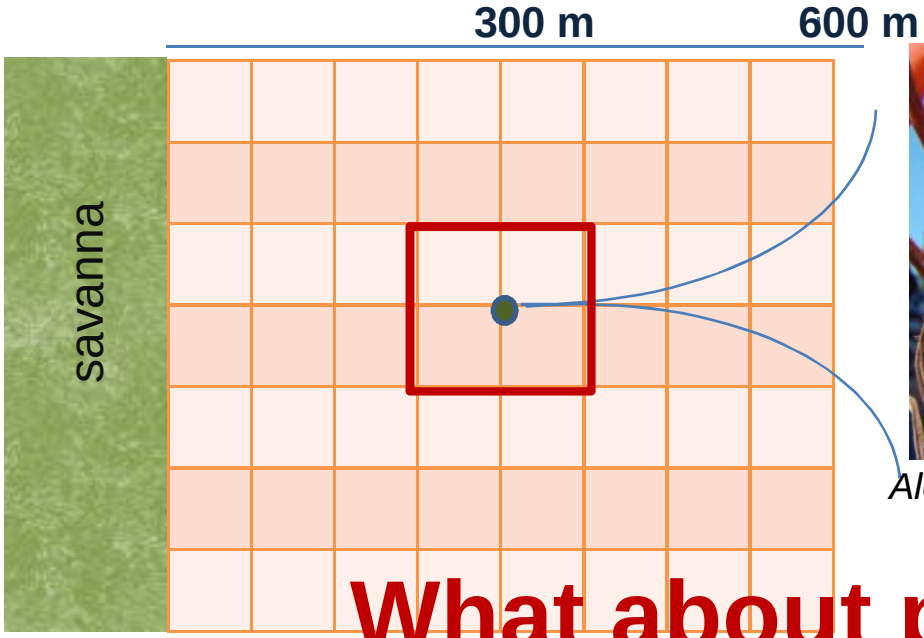
NE Limpopo, South Africa

Carvalheiro et al. (2011) Natural and within-farmland biodiversity enhances crop productivity. *Ecol. Letters*



↑ Plant diversity

↑ Visitors to the crop (abundance & diversity)



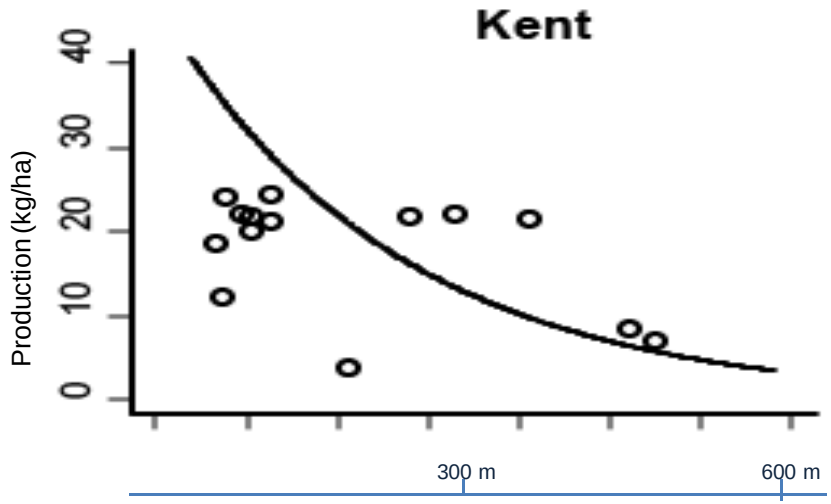
Aloe greatheadii *Barleria obtusa* **25 m²**

What about production ?

Carvalheiro et al. (in prep) Enhancing native floral diversity within farmlands benefits pollination services in large agriculture fields – an experimental approach

How flower visitor abundance and diversity affect crop productivity? **- Mango**

Example from organic farms:



Weeds increase mango production

Aloe greatheadii

Barleria obtusa

25 m²

Carvalheiro et al. (in prep) Enhancing native floral diversity within farmlands benefits pollination services in large agriculture fields – an experimental approach

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Pollinator-plant communities

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Pollination Services & Honey production

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Value of products

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Thank
you