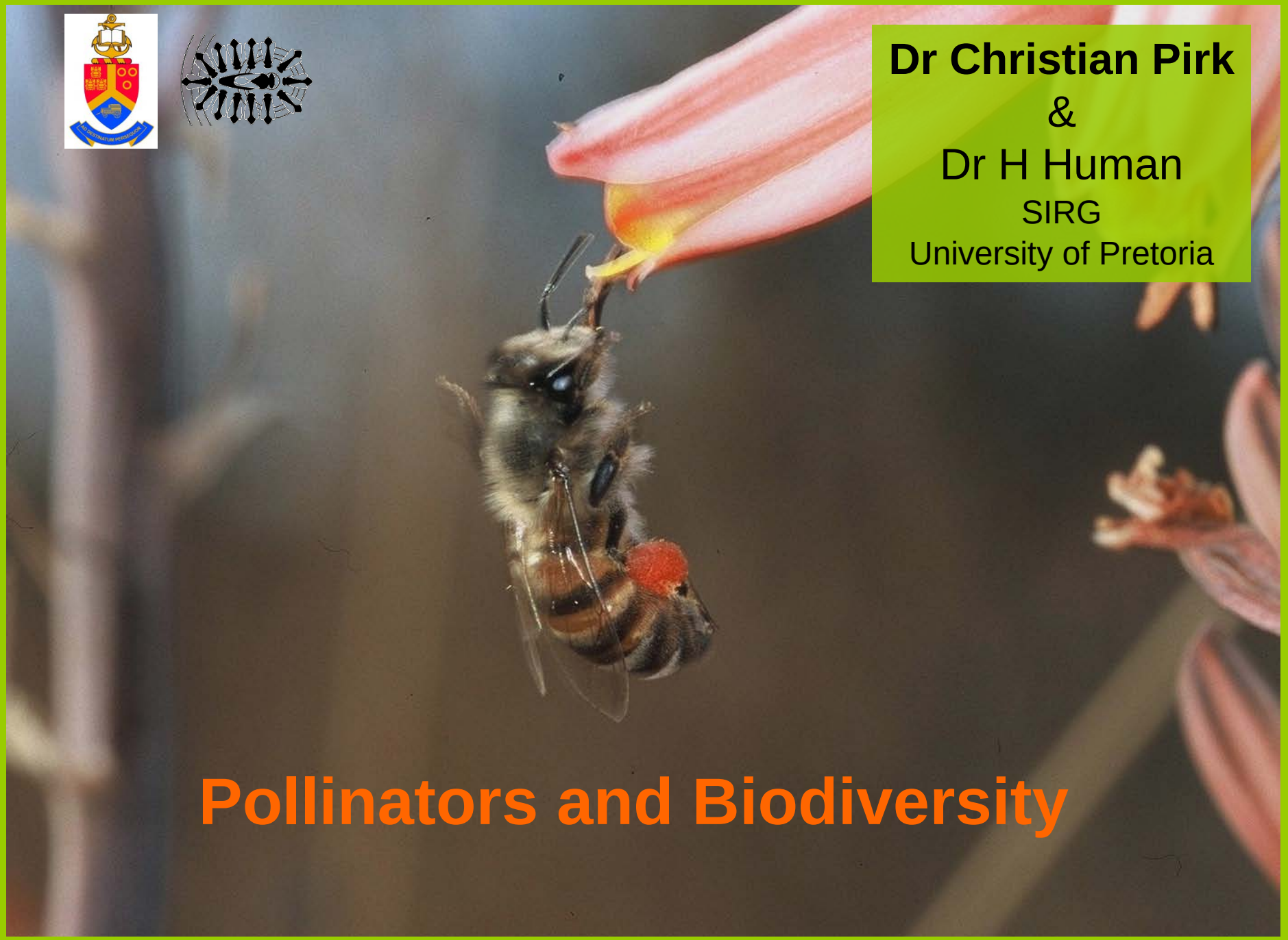

Dr Christian Pirk
&
Dr H Human
SIRG
University of Pretoria

Pollinators and Biodiversity

33% of crops depend on pollinators

85% of all plant species depend on pollinators

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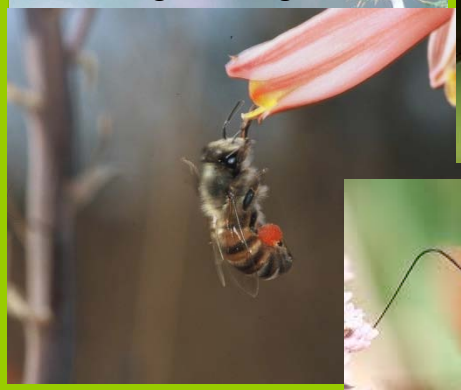
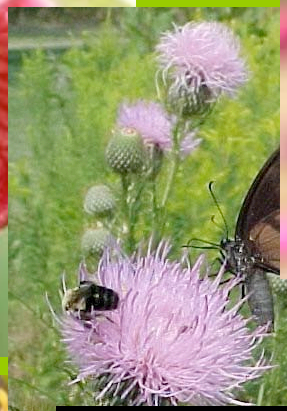
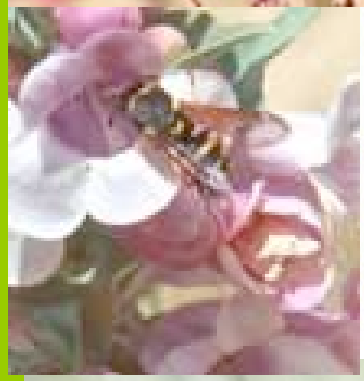
Biodiversity of pollinators





Biodiversity of pollinators



> 30,000 bee species

numerous other hymenopterans

most of the 150,000 fly species

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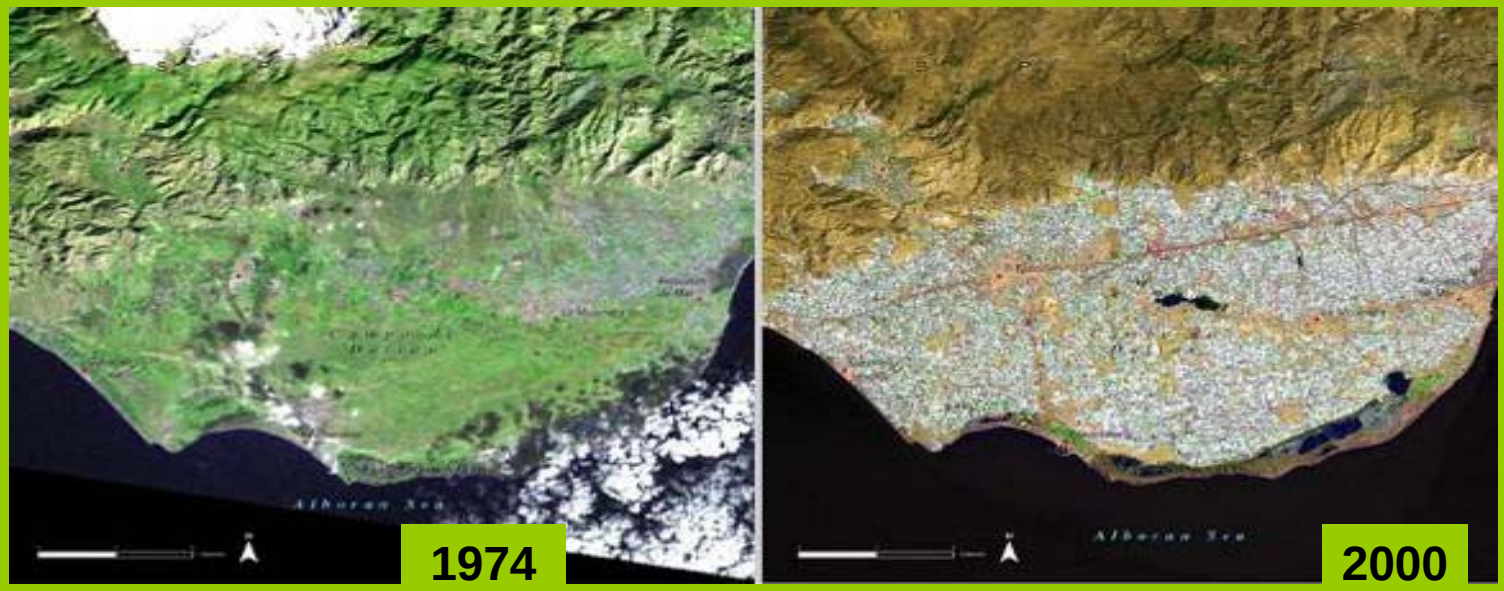
Honeybees - a major pollinator

FIGURE 1. Autochthonous subspecies of *A. mellifera*. Data from Fuchs, 1998a,b.

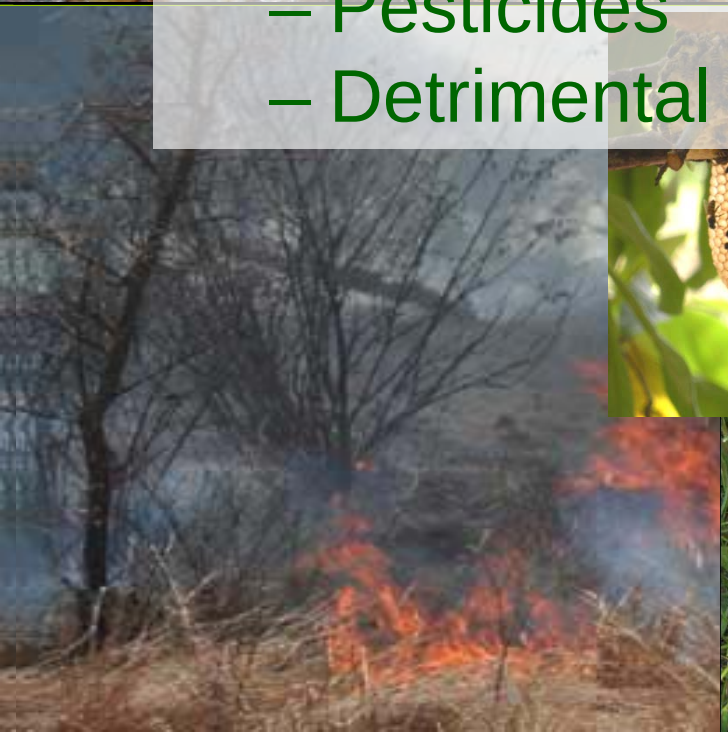
30 % of the food is pollinated by bees

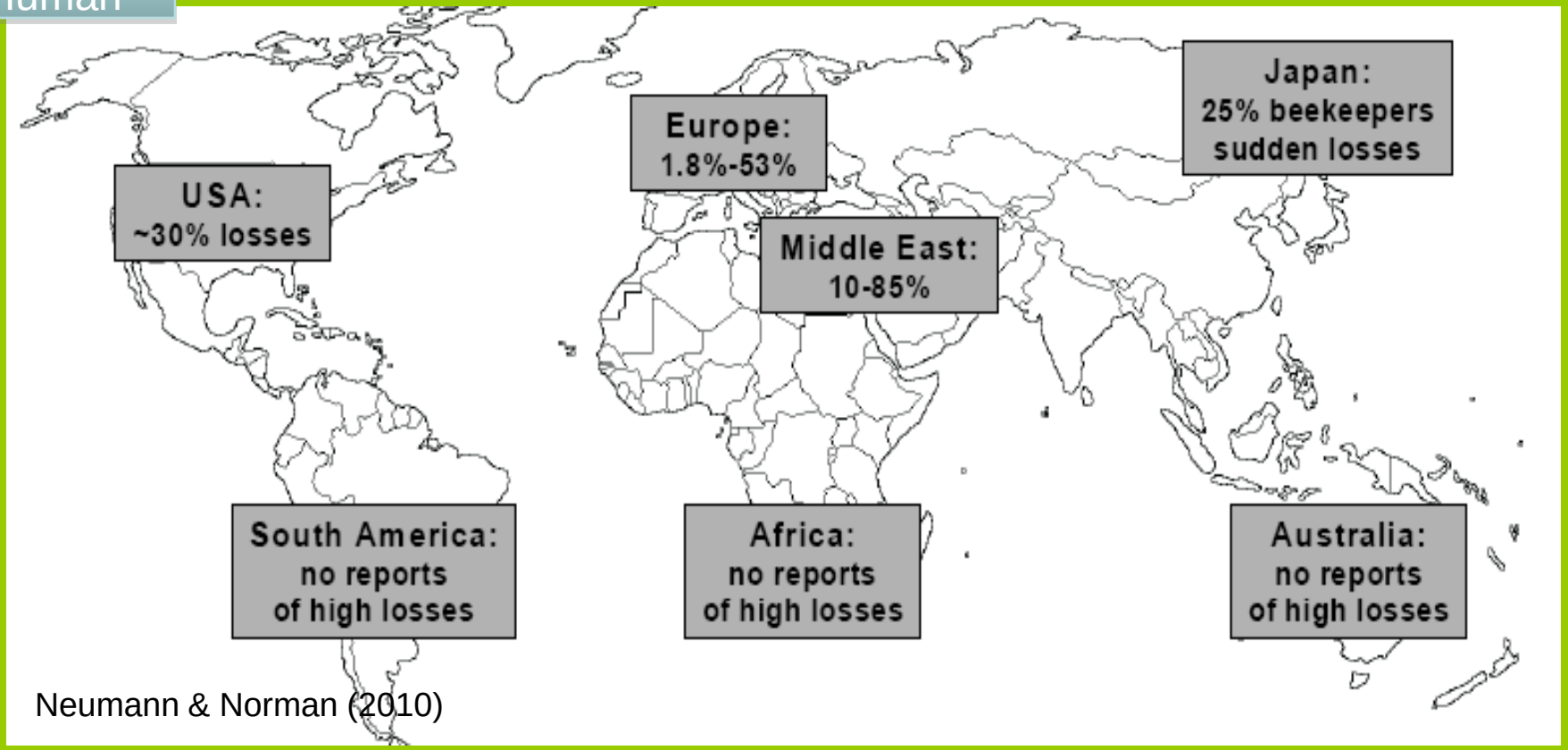
- Possible drivers for decline
  - Habitat loss due to intensive land use
  - Climate change



- Up to 30% of natural habitat in the Cape floral region could be lost in next 20 years due to:
  - urbanisation
  - agricultural land use
  - climate change


- Possible drivers for decline
  - Globalization & introduction of foreign species eg: *Varroa destructor* & AFB
  - Pesticides
  - Detrimental beekeeping practices



Neumann & Norman (2010)

- High colony losses have become a general rule, yearly occurrence
- Result of several contributing factors

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- Decline of honeybees in the USA, CAN, Mexico to the levels of 1950s.
- Relationship between pollinator decline and plant species decline in NL, UK.

Parallel Declines in Pollinators and Insect-Pollinated Plants in Britain and the Netherlands

J. C. Biesmeijer,[1*] S. P. M. Roberts,[2] M. Reemer,[3] R. Ohlemüller,[4] M. Edwards,[5] T. Peeters,[3,6] A. P. Schaffers,[7] S. G. Potts,[2] R. Kleukers,[3] C. D. Thomas,[4] J. Settele,[8] W. E. Kunin[1]

www.sciencemag.org SCIENCE VOL 313 21 JULY 2006

- Pollination services of crops 150 billion Euros
- 3 Billion worth of crops in the US (wild native bees)
- Value of the deciduous fruit industry 500 million USD

Valuing Insect Pollination Services with Cost of Replacement

Mike H. Allsopp[1], Willem J. de Lange[2], Ruan Veldtman[3]*

- Biodiversity enhances productivity (Sunflower pollination South Africa)

Luísa Gigante Carvalheiro,[1,2]* Ruan Veldtman,[1,3] Awraris Getachew Shenkute,[2] Gebreamlak Bezabih Tesfay,[2] Christian Walter Werner Pirk,[2] John Sydney Donaldson[1,4] and Susan Wendy Nicolson[2]

ECOLOGY LETTERS

Ecology Letters, (2011) **14**: 251–259 doi: 10.1111/j.1461-0248.2010.01579.x

Natural and within-farmland biodiversity enhances crop productivity

Conservation of natural patches combined with promoting flowering plants within crops can maximize productivity and, therefore, reduce the need for cropland expansion, contributing towards sustainable agriculture.

- The fate of many plants and pollinators will depend on preserving their mutualistic relationships with each other and within the web of organisms that affect plants and pollinators.
- Total pollination failure of crops
- or one has to rely more on managed pollinators
- Will also result in an impoverished food parcel: vegetables, nuts, fruits and stimulant crops will be most affected resulting in vitamin & mineral shortages

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Thank you
Dankeschön
谢谢
Dankie