MANAGED BEES ACROSS LARGE LANDSCAPES IN SOUTH AFRICA...
The Global Pollination Project and Honeybee Forage Project

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Global Pollination Project
Sites in SA

- Payment for mgd bees
- Export regs!
- Attractive to pollinators

Biodiversity Hotspot!

Springbok Flats
sunflowers

- No payment for mgd bees
- Vast landscapes
- Attractive to pollinators

Biodiversity Hotspot!

Boland, Koue Bokkeveld & Langkloof apples

- Payment for mgd bees
- Valuable export crop
- Attractiveness variable

Biodiversity Hotspot!
Some findings: apples

Importance of wild versus managed pollination
Madelé Mouton MSc Stellenbosch University (2010)
No difference in fruit set, but orchards using only wild bees had significantly lower seed-set. Therefore managed pollination is very important (export!)

Deficit work
- Difficult to determine due to thinning, and no deficit due to current practices of bringing in managed bees

Pan trapping monitoring
- Very low catches in orchards
- Sampling in natural veg very different composition (monkey beetles!)

![Graph showing pollinator counts in apples](image)
Some findings:
hybrid onion seed

Mariëtte Brand  PhD student Stellenbosch University (2012)
- Honeybees 90% of insect visitors seen foraging
- Pan trapping resulted in 40 other species recorded, and difference in composition between years

Deficit work
Limited numbers of non-honeybee visitors on crops
Farmers use mngd honeybees (mostly commercial) – no deficit

Pan trapping monitoring
2yrs to date – honeybees 80% of all bee spp; \( \frac{1}{3} \) non-apis community
Will do 2 more years of pan trapping
Some findings: sunflowers

Awraris Shenkute (MSc 2009) – behavioural response
- ↓ abundance with ↑ distance from natural habitat
- Inter-species competition could increase cross-pollination

Gebreamlak Tesfay (MSc 2009) – mgd bees to yield & quality
- managed bees ↑ seed quality & quantity, but management needed

Papers (Dr Luisa Carvalheiro):
- Natural and within-farmland biodiversity enhances crop productivity (sunflowers) – Ecology Letters

Deficit work
Honeybees major pollinator, but less management
Sunflower fields important resource for beekeepers

Pan trapping monitoring
Low capture, done 2 yrs, 1 more year
What now?

Two fundamental findings have resulted in paradigm shift in S. Africa:
1. Yields wrt pollination issues not a worry for farmers, i.e. no pollination deficits
2. Pollination management is considered to be near optimal using mgd honeybees

Managed Honeybees:
Relatively cheap, dependable resource; effective pollination strategy with large numbers brought in for short periods.
Not same scale problems as in Europe and North America.

But: SUSTAINABILITY of POLLINATION SERVICES (wild&mgd)?
Next logical question: what is the ECOLOGICAL INFRASTRUCTURE that supports this pollination service? (resources across landscapes)
Honeybee Forage Project

Working for Water funding; 2011-2013

- Relative importance of forage resources
- Spatial data of forage resources
- Alternative forage resources
- Optimal forage management
- Supply and demand of honeybees in SA

Allsopp’s chocolate cake
Honeybee Forage Project

James Hutton-Squire (MSc Stellenbosch University) “Historical and current relationship between the honeybee (Apis mellifera) and its forage in South Africa”

- Top forage species used by SA Beekeepers (historically, currently)
- Categorise forage according to growth form (possible uses)
- Spatial Online Forage Maps

Tlou Masehela (PhD Stellenbosch University) “Ecosystem services that support managed honeybees in South Africa: their availability, importance, current use patterns, potential for enhancement and management”

- Comprehensively document South Africa’s current & potential honeybee forage resources.
- Outline the importance of Ecosystem Services that support managed honeybees
- Assess and evaluate the supply and demand of honeybees for pollination
- Provide means and ways to best maximise, manage and ensure the sustainable use of these resources

Annalie Melin (PhD University of Cape Town) “Understanding the landscape requirements for pollination services derived from managed honeybees”

Management of the pollination service and the ecological infrastructure that supports the service is best considered in two regions:

Two sub-species: *Apis mellifera capensis* / *A.m. scutellata*

Indigenous → wild & managed populations the same

Trapping + absconding!

- Profiles of beekeepers and farmers in the two regions (capensis done)
- Desktop research about two regions
- Bring together results of all research
- Not easy!!
Capacity Building

Undertook capacity needs assessment through survey & curricula analysis

Working with 6/7 institutions: “train trainers”

Various levels: High School/College/University

Materials:

- About the projects brochure & poster
- “Pollinators in Africa” booklet
- “Pollinators of SA Crops” Poster
- Guest lectures and talks (ongoing)
- DVD with film and associated activities (2013)
- Book: “Beeplants of South(ern) Africa” (early 2014)
- Booklet (end 2014 – translation of management consideration)

+ Observation hive project (?)
+ CapeNature Factsheet 2013/4
+ forage maps, calendars, seed packets – what to plant, when, where
Public Awareness

Conferences/speaking opportunities:
• Conservation conferences
• Beekeeper association meetings & BeeCon
• Farmers' meetings
• Provincial gov workshops (extension off.)

Press Release about the projects (July 2011)
• 3x newspapers articles  (Saturday Star + Volksblad + Sunday Times)
• 8x magazine/journal articles  (Farmer's Weekly, Veld & Flora, SA Bee, SA Fruit)
• 4x e-newsletter stories (CAPE, CAWC, WESSA, SANBI)
• 5x radio slots (702, Channel Africa, SAfm, RSG)
• 2x television interviews

Brochures, posters, Pollinators in Africa given out

Another press release planned for end 2013/early 2014 – results of James' MSc, hopefully start “plant bee-friendly” campaign

Global Pollination and Honeybee Forage Projects

SANBI's Ecosystem Services Programme under the Applied Biodiversity Research Division is implementing very interesting projects on pollination in crop agriculture and the honeybee.

Background & reason for our projects

Animal pollination is required for approximately one-third of human food consumed on the planet (many fruits and vegetables), and for the production of many fodder, seed, flower and oilseed crops. Insects, birds, bats, and other animals serve as pollinators while they forage for their own survival, consequently providing a free ecosystem service upon which we depend. Honeybees are a pivotal species in Africa as the most important generalist pollinator on the continent. Honeybees pollinate 40-70% of indigenous flowering plants and probably supply up to 90% of commercial pollination. About 50 crops in SA are insect-pollinated, with much of the service provided by beekeepers and their managed honeybees.

There is mounting evidence of a global “pollination crisis” with the mysterious disappearance in Europe and the USA of many honeybee colonies and the isolation of beekeeping colonies on the continent due to increased geographic isolation. SANBI is committed to the conservation, sustainable use and management of pollinator species and ecosystems for the continued provision of ecosystem services.
Mainstreaming

Policy in South Africa complex and challenging, set systems and timeframes. Practice is hard to change without very clear evidence and guidance — and also when science is relatively slow.

Need high-level “champions” as awareness on pollination/pollinator issues low.

Designing an “Impact Pathway” — science uptake and utilisation

- **Building understanding** of honeybees as important crop pollinators (policy makers, educators, general public)

- **Protection of existing forage resources** for honeybees: management of eucalypt, indigenous and crop forage; access to unusable forage (policy makers, forestry industry, private landowners, managers of public land)

- **Establishment of new small-scale forage resources** for honeybees through exploring potential to grow forage on public and private land (managers of public land, forestry industry, landowners, urban greening programmes, general public)
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