

Global Pollination Project and Honeybee Forage Project South Africa

Implemented by the South African National Biodiversity Institute (SANBI) as part of the GEF/UNEP/FAO Global Pollination Project (GPP), also entitled "Conservation and Management of Pollinators for Sustainable Agriculture through an Ecosystem Approach"

Profile: Dirk Daling – Sunflower Seed Farmer



Dirk Daling admiring his new seed maize crop

Introduction

The purpose of the case studies/profiles of the GPP is to showcase practices that have a different approach and are therefore of interest and possible value. In the South African project, farmers and beekeepers are reliant on and work with honeybees. Farmers utilise honeybees for pollination of their crops and commercial beekeepers use honeybees to provide pollination services and/or to make honey. The way farmers or beekeepers utilise honeybees has often been developed individually through years of learning and experience. While the different practices discussed in the profiles are not scientifically proven to have benefits (such as increasing agricultural yield or promoting pollinator conservation), they mean something to the individuals in the profile and may inspire people in the sector to explore alternative practices and possibly result in scientific research being undertaken. It is through the exploration of a range of different practices that lessons may be learned and applied at wider scales to benefit both agricultural and environmental conservation considerations.

Many farmers and beekeepers in South Africa undertake innovative practices relating to pollination issues, and it is unfortunate that we cannot profile more. We hope that the profiles/case studies that we have chosen to present here are understood as being just some of the many interesting practices that could inspire discussion and consideration, and not as the championing of any particular practice or person.

The reason we chose to profile Dirk Daling is that he has some unusual practices on his farm that allow him to make better use of rain water. Sunflower seed farmers in his area are all heavily reliant on rain water for their crops to grow, as the dominant method of cultivation is dry-land agriculture.

The Project Management Unit of the GPP in South Africa interviewed Dirk Daling on 6th November 2013 at his farm "Turfpan" in Settlers near the town of Bela-Bela in the Limpopo Province of South Africa. Additionally, South African GPP fieldwork for monitoring and deficit research has taken place on Dirk's farm.

This document is structured in such a way as to tell Dirk's story in his own words. A short "lessons learned" section at the end discusses some of the possible implications of Dirk's practices.

Disclaimer: the practices discussed in this document have not been scientifically proven. This profile is therefore intended as an anecdotal account from which readers may draw their own conclusions.

Dirk's farm history

Dirk Daling studied Agricultural Engineering at university. He and his brothers inherited the farm from his father, who was a sunflower seed production farmer, in 1984.



Planted rows in sunflower field (photograph Dirk Daling)

The farm is 2,500 hectares under crops, with the whole farm being just over 3,000ha (cattle utilise the wetter areas that cannot be ploughed for grazing). When the price was favourable, he also planted cotton; however, this required the use of organophosphates (spraying every two weeks), which definitely caused a decrease in bird life on the farm. When the price of cotton decreased, Dirk went back to planting sunflower seed, sorghum and maize. He is satisfied with his crop rotation practices of sunflowers and maize, and currently plants about $\frac{2}{3}$ sunflowers to $\frac{1}{3}$ maize as he realised he needed more material on the ground to be turned back into the soil when he used to plant 80/20 in favour of sunflowers. Sunflower production does not leave enough material on the land.

Dirk's farming system

Dirk noted that he does not have any major problems in terms of pollination, as the real problem in sunflower oilseed farming is the droughts (only some portions of the farm are under irrigation – the seed maize crop, which is 110ha). Dirk approximates that 80% of his problems with yield are to do with rainfall, while only 20% are connected to pollination and/or other issues. Dirk commented that the farmers who grow the original sunflower seed (seed multipliers) are very concerned about pollination and often pay for the pollination service. But the seed-for-oil farmers, such as Dirk, do not feel they are dependant enough on the pollination service to pay for it. He said that beekeepers do bring their hives and put them around his fields during the sunflower flowering period, as they value the honey from the sunflowers. He mentioned that the relationship between him and some of the beekeepers (approximately one or two each year) is a mutual one where beekeepers bring their hives to work the sunflowers, and provide him with a few jars of honey. He does not communicate in person with the beekeepers, but sometimes talks to them over the telephone. Dirk noted that he has occasionally had to ask some unknown beekeepers to leave the farm, as he does not like too many beekeepers at one time. He noted that competition between the beekeepers for spaces to leave their hives is fierce. When asked about whether he is concerned about corridors for wild pollinators on his farm, Dirk said he is not really worried about such things as pollination is an issue only contributing to less than 20% of potential yield problems. He noted that his field sizes are determined by the natural landscape and wetland areas, not due to requiring corridors for pollinators.

As his cattle graze the natural areas in between the crops, Dirk also pays attention to issues such as bush encroachment. He noted that managing the natural areas for grazing allows other issues, like birdlife, owls (that control rodents) and pollinators, to fall into place. Dirk stated that his natural areas on the farm are important to him as he enjoys the wildlife on the farm. He

considers that most of the sunflower farmers realise the importance of the natural areas, and realise that the use of chemicals is a last resort to control pests.

Dirk employs 40 permanent labourers and brings in 60 seasonal labourers for manual work, such as weeding or to pull out the flower head of the seed maize. Dirk is a member of the Springbok Flats Farmer Association and the local farmers use this forum to share information on their farming practises. According to Dirk, pigeons in the area are a problem because they feed on sunflower seeds – and he would like the farmer association to discuss this issue. Commando worms can also become a problem, but then can be controlled by the escalation of birds (which he has seen as a result of less pesticide use).

With regards to the water issue, Dirk said that one of his first concerns when taking over the farm was the large run-off of rain water. As the composition of the soil is clay, when the soil is dry it shrinks and is compacted and when wet it swells and becomes uncompact. Infiltration by water can be very slow and, as the most common rainfall is in thunder showers or large volumes at a time, the challenge is that this type of rainfall results in too much run-off and too little retention. Dirk therefore invented a ploughing implement to create small dirt walls within a row to collect small pools of water (or 'dammetjies') to retain the water for a much longer period and drastically reduce run-off. Tilling and the creation of the 'dammetjies' occurs in one action. Dirk decided not to patent his design, and does not hire it out to other farmers, but several neighbours have asked Dirk to share the design and are building their own similar implements.



*Dirk's invention creating 'dammetjies' (little dams) to retain run-off water
(photographs by Dirk Daling)*

Dirk always waits for the soil to be very moist before he starts planting. Some herbicides are used just before planting on the row ridge. When the sunflowers are 30cm high, Dirk weeds by tilling, and makes more 'dammetjies' (pools/small dams). After 120 days from seeding he starts harvesting. The 'dammetjies' are approximately 2.5m long and there ends up being approximately 4,000 'dammetjies' per hectare.

Dirk's Vision – challenges and opportunities for wider adoption

According to Dirk university only stimulates a way of thinking but does not necessarily teach you how to do things. He has had good success with designing his own implements to solve problems he sees on the farm, and the 'dammetjie' implement certainly has potential for wider adoption. While Dirk understands the trends towards no-till agriculture, he noted that when done incorrectly no-till can cause more damage to the soil and cause serious erosion problems in the sunflower landscape.

With regards to pollinators, he is realistic about the fact that humans need to conserve bees and ensure habitat is preserved. An idea for the future is to place old tyres around his fields for bees to nest in, to thereby improve habitat on his farm for honeybees.

Dirk, along with many other farmers, has unanswered questions in relation to pollinators. He believes that the pollination service should be more organised, but that there is a lack of information to do so. Information such as where to place hives around the fields, how far apart, how many hives per hectare, etc. is required. Experimenting with these issues is very challenging and therefore such experiments have not yet been conducted in the sunflower region.

Lessons Learnt:

While Dirk himself does not specifically provide lessons regarding pollination issues, the understanding of his entire farming system provides the following lessons:

- Many solutions to problems in agriculture can be found through innovative thinking and practical experimentation, and such information does trickle to other farmers in the area (i.e. the 'diffusion of information' system of learning is still very active, even in today's sophisticated world).
- Much more research is needed regarding the managed pollination service in a large-scale monoculture crop system that does not pay for pollination, but is attractive to pollinators. Issues such as honeybee hive density and distribution throughout the fields to be investigated.

This profile will be linked to the management consideration for pollination services in South Africa document that will be available towards the end of the project
