

AGRI-

probe

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Research and news magazine of the Western Cape Department of Agriculture
Nuus en navorsingstydskrif van die Wes-Kaap Departement van Landbou
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**EKSTENSIEWE
BOERDERY:**
Navrae aan die
veldnavorsingspan

**MAINSTREAMING
SUSTAINABILITY**
and Optimising
Resource-use Efficiency

Is it true that all
**COMMERCIAL
FARMERS**
are getting richer?

Wes-Kaapse
navorsers kuier by die
OEWERKONYNE
in die Noord-Kaap!

Welcome to our Wonders of Natural Resources edition! With COP17 just around the corner, it is only appropriate that we shine the light on the gifts of the earth and exactly what we do to conserve them for our future generations. Once everyone starts to realise that we are merely borrowing this planet from our children, more people will hopefully try to protect it.

To ensure that we give you some of the best information there is to offer on natural resource management we have invited a guest writer from the Department of Environmental Affairs and Development Planning to enlighten you on the topic of mainstreaming sustainability and optimising resource-use efficiency. But how do we turn theory into practice? An article on developing an operational remote sensing system for monitoring of efficient crop water of grapes in the Western Cape Province shows how to increase agricultural production while reducing water consumption. A practical look at managing a scarce and highly sought-after resource like water.

With water and soil being two of the most critical natural resources in Agriculture we take you on a journey to the Hex River and give you a glimpse of the vast progress we are making with river protection works and clearing of alien vegetation. The theme of natural resources is solidly grounded in articles on conservation agriculture, crop rotation and soil research.

Furthermore, our journal offers you meaty articles on medicinal plants, kikuyu-ryegrass pastures and biofuel production.

Don't miss our articles on the Fynbos Conservation Awards that were handed out at the annual C.A.P.E. conference and the winners of our Extension- and Advisory awards which was the highlight of this year's Departmental Extension- and Advisory Symposium. These are the people whose actions speak much louder than words and our Planet are truly blessed to have them around.

Ending on a very high note, we bring you all the detail around the recent SAIGA Awards, which crowned the Department of Agriculture as the best department (provincially and nationally) in the country! It sure is no mean feat and the Department as a collective can take credit for this highly acclaimed accolade.

Enjoy the read!

Petro

Petro Van Rhyn
Head of Communications
Department of Agriculture, Western Cape



“DON'T IT ALWAYS SEEM TO GO THAT YOU DON'T KNOW WHAT YOU'VE GOT TIL IT'S GONE. THEY PAVED PARADISE AND PUT UP A PARKING LOT”

JONI MITCHELL

AgriProbe

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If you need any of the articles in this magazine in any other of the official languages of the Western Cape, we would be happy to arrange a translation for you. Please contact the editor on Tel: 021 808 5008.

Indien u enige van die artikels in hierdie tydskrif in een van die ander amptelike tale van die Wes-Kaap benodig, kan u ons gerus kontak om die vertaling daarvan te reël. Kontak die redakteur by Tel: 021 808 5008.

Ukuba ufana naliphina inqaku elikule magazini ngolunye ulwimi olusesikweni kwilwimi zeNtshona Koloni, siya kukulyngiselela uguqulelwimi lenqaku elo. Nceda ke uqhagamshelane noMhleli kule nombolo yomnxeba 021 808 5008.



Message from Gerrit van Rensburg, Minister of Agriculture and Rural Development

WESTERN CAPE STRATEGIC OBJECTIVES

The Western Cape Government has set itself the very ambitious target of being the best run local government in the world. Some might say this is too ambitious and unattainable. We prefer to say if you do not aim high you will always shoot low. On the other hand it is also easy to make lofty pronouncements on where you wish to go, but it is something altogether different to actually doing it.

In order to achieve this goal, we have set ourselves 11 strategic objectives. If we can be successful with the 11 objectives, we should be within reach of our ultimate goal and objective number 12: To be the best run local government in the world. Agriculture plays an important role in a number of these objectives.

Objective number 1 states that we should focus on economic growth in order to create jobs and to reduce poverty in our province. This is the foundation from where everything else will happen. Agriculture is already a crucial part of the Western Cape Economy, and will play a leading role in this objective.

Objective number 7 promotes our natural resources and the optimal usage thereof. As agriculturalists, we make our living from nature. Farmers and farm workers are custodians of our natural resources, and are key role players when the protection of the environment is concerned.

Objective number 11 focus on our rural areas, and the challenges associated with development in our countryside. Our rural towns are often agricultural hubs with support services and economic linkages for the primary produce coming from the surrounding farms. This means that any rural development initiative in the Western Cape will be depended to some degree on agricultural activities.

Agriculture also influences other objectives in a less direct, but still fundamental, manner. For instance, objective number 3 speaks to infrastructure development. Objective number 8 addresses the challenges of poverty and social cohesion. With 120 000 farm workers in our province, agriculture will play a very important role regarding this aspect as well.

As employees of the Department of Agriculture we should remember that our work in the agricultural sector is important, because the sector is important to the well being and future prosperity of the Province. If we do our bit properly, we are bringing the Province one step closer to that ultimate goal: To be the best run local government in the world.

THE PROVINCIAL STRATEGIC PLAN

Joyene Isaacs
Head of the Department



The vision of the Provincial Strategic Plan is 'An open opportunity society for all' in the Western Cape. This Plan encompasses 12 strategic objectives, which describes the policy direction and the key interventions.

Each of these Provincial Strategic Objectives (PSOs) is developed to highlight the challenges for progress in the Province, the need to work transversally within and between departments and across governmental spheres as well with business, labour and civil society and the key interventions required.

These PSOs are linked to the national outcomes as well, which facilitates the reporting requirements but allows for the alignment of both national and provincial outcomes. Below is the list of the PSOs and National Outcomes:

National outcomes

1. Improved quality of basic education
2. A long and healthy life for all South Africans
3. All people in South Africa are and feel safe
4. Decent employment through inclusive economic growth
5. A skilled and capable workforce to support an inclusive growth path
6. An efficient, competitive and responsive infrastructure network
7. Vibrant, equitable and sustainable rural communities with food security for all
8. Sustainable human settlements and improved quality of household life

9. A responsive, accountable, effective local government system
10. Environmental assets and natural resources that are well protected and continually enhanced
11. Create a better South Africa and contribute to a better and safer Africa and World
12. An efficient, effective and development oriented public service and empowered, fair and inclusive citizenship

Provincial Strategic Objectives

1. Increasing opportunities for growth and jobs
2. Improving education outcomes
3. Increasing access to safe and efficient transport
4. Increasing wellness
5. Increasing safety
6. Developing integrated and sustainable human settlements
7. Mainstreaming sustainability and optimizing resource-use efficiency
8. Increasing social cohesion
9. Reducing and alleviating poverty
10. Integrating service delivery for maximum impact
11. Creating opportunities for growth and development in rural areas

To put these National Outcomes and Provincial Strategic Objectives in the Department of Agriculture's context a summary in tabular format is presented to highlight the synergies and complementarity.

DEPARTMENTAL THEMES	NATIONAL OUTCOME	PROVINCIAL STRATEGIC OBJECTIVE
Rural Development	NO 7: Vibrant, equitable and sustainable rural communities with food security for all	PSO 11: Creating opportunities for growth and development in rural areas
Market Access for all Farmers	NO 4: Decent employment through inclusive economic growth NO 7: Vibrant, equitable and sustainable rural communities with food security for all	PSO 1: Increasing opportunities for growth and jobs PSO 11: Creating opportunities for growth and development in rural areas
Revitalisation of Extension	NO 7: Vibrant, equitable and sustainable rural communities with food security for all	PSO 9: Reducing and alleviating poverty PSO 11: Creating opportunities for growth and development in rural areas
Increase Agricultural Production	NO 4: Decent employment through inclusive economic growth NO 7: Vibrant, equitable and sustainable rural communities with food security for all	PSO 1: Increasing opportunities for growth and jobs PSO 9: Reducing and alleviating poverty PSO 11: Creating opportunities for growth and development in rural areas
Human Capital Development	NO 5: A skilled and capable workforce to support an inclusive growth path	PSO 1: Increasing opportunities for growth and jobs PSO 11: Creating opportunities for growth and development in rural areas
Research and Technology	NO 4: Decent employment through inclusive economic growth NO 5: A skilled and capable workforce to support an inclusive growth path NO 7: Vibrant, equitable and sustainable rural communities with food security for all NO 10: Environmental assets and natural resources that are well protected and continually enhanced	PSO 1: Increasing opportunities for growth and jobs PSO 7: Mainstreaming sustainability and optimizing resource-use efficiency PSO 11: Creating opportunities for growth and development in rural areas
Natural Resource Management	NO 4: Decent employment through inclusive economic growth NO 7: Vibrant, equitable and sustainable rural communities with food security for all NO 10: Environmental assets and natural resources that are well protected and continually enhanced	PSO 7: Mainstreaming sustainability and optimizing resource-use efficiency PSO 11: Creating opportunities for growth and development in rural areas

DEPARTMENTAL THEMES	NATIONAL OUTCOME	PROVINCIAL STRATEGIC OBJECTIVE
Farm Worker Development	NO 7: Vibrant, equitable and sustainable rural communities with food security for all	PSO 9: Reducing and alleviating poverty PSO 11: Creating opportunities for growth and development in rural areas
International Cooperation	NO 11: Create a better South Africa and contribute to a better and safer Africa and World	PSO 1: Increasing opportunities for growth and jobs PSO 11: Creating opportunities for growth and development in rural areas

PSO 11 deals with the key interventions identified for the agricultural sector and rural areas, and these are presented below. Obviously the Department does not operate in isolation and participate in the Economic and Infrastructure Strategic Group of the Province, but has a vested interest in the Social and Governance Strategic Groups as well.

As mentioned above, the need to work transversally is highlighted, and this means by way of example:

Agriculture requires natural resources to 'do business' but because PSO 7 deals with the "Mainstreaming sustainability and optimizing resource-use efficiency" the natural resource management will be discussed, debated and reporting under this PSO, with the officials of the Department actively participating.

The table below details the focus areas of the Department, the strategic goals as contained in the Annual Performance Plan and Strategic Plan of the Departments as well as the links with the Provincial Strategic Objectives.

DEPARTMENTAL THEMES	STRATEGIC GOALS	PROVINCIAL STRATEGIC OBJECTIVE
Rural Development	The development of selected rural nodes to facilitate their socio-economic growth in the constraints of a sustainable future	PSO 11: Creating opportunities for growth and development in rural areas
Market Access for all Farmers	Support the agricultural sector to at least maintain the 20,8% export contribution the Province made towards the country profile for the next 5 years	PSO 1: Increasing opportunities for growth and jobs PSO 11: Creating opportunities for growth and development in rural areas
Revitalisation of Extension	Ensure that at least 60% of all agricultural land reform projects in the Province are successful over the next 5 years Collaborate with farmers and industries to support the sector to increase agricultural production (primary provincial commodities) by at least 10% over the next 10 years	PSO 9: Reducing and alleviating poverty PSO 11: Creating opportunities for growth and development in rural areas
Increase Agricultural Production	Ensure that at least 60% of all agricultural land reform projects in the Province are successful over the next 5 years Collaborate with farmers and industries to support the sector to increase agricultural production (primary provincial commodities) by at least 10% over the next 10 years	PSO 1: Increasing opportunities for growth and jobs PSO 9: Reducing and alleviating poverty PSO 11: Creating opportunities for growth and development in rural areas
Human Capital Development	An enabling environment to ensure the sustainability of the agricultural sector and to ensure the implementation of the strategic goals	PSO 1: Increasing opportunities for growth and jobs PSO 11: Creating opportunities for growth and development in rural areas
Research and Technology	Support the agricultural sector to at least maintain the 20,8% export contribution the Province made towards the country profile for the next 5 years Ensure that at least 60% of all agricultural land reform projects in the Province are successful over the next 5 years	PSO 1: Increasing opportunities for growth and jobs PSO 7: Mainstreaming sustainability and optimizing resource-use efficiency PSO 11: Creating opportunities for growth and development in rural areas
Natural Resource Management	Collaborate with farmers and industries to support the sector to increase agricultural production (primary provincial commodities) by at least 10% over the next 10 years Protect, enhance and promote the use of our natural resources in a sustainable manner (within the constraints of climate change) to ensure food security	PSO 7: Mainstreaming sustainability and optimizing resource-use efficiency PSO 11: Creating opportunities for growth and development in rural areas
Farm Worker Development	Support the agricultural sector to at least maintain the 20,8% export contribution the Province made towards the country profile for the next 5 years	PSO 9: Reducing and alleviating poverty PSO 11: Creating opportunities for growth and development in rural areas
International Cooperation	Support the agricultural sector to at least maintain the 20,8% export contribution the Province made towards the country profile for the next 5 years	PSO 1: Increasing opportunities for growth and jobs PSO 11: Creating opportunities for growth and development in rural areas

CAPE FYNBOS CONSERVATION Awards 2011

Petro van Rhyn
Head of Communications
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Fitr: Chris Martens, Minister Gerrit van Rensburg, Wim Filmlter (on behalf of Marina Eihlers), Johan van Biljon and Minister Anton Bredell

In June the third annual Fynbos Conservation Awards were awarded through the Cape Action for People and the Environment (CAPE) partnership programme. The awards recognised individuals' outstanding contribution or achievement amongst their peers in the broad biodiversity conservation community. It also showcased successful or innovative work by the conservation sector.

The awards highlighted individual achievements in working towards the goal of the CAPE partnership programme that "by the year 2020, the cooperation of capable institutions ensures that the biodiversity of the CFR is conserved, sustainably utilised and effectively managed, delivering significant benefits to the people of the region in a way that is embraced by local communities, endorsed by government and recognised internationally."

The evening event at Delvera Farm included addresses by the Western Cape Minister of Agriculture and Rural Development, Mr Gerrit van Rensburg as well as the Western Cape Minister of Local Government, and Environmental Affairs and Development Planning, Mr Anton Bredell.

Minister van Rensburg thanked farmers in general for providing food, creating employment and leading the way regarding the protection of the environment. "Thank you for caring for nature, even during times when it is difficult to care for your family." He also thanked the Department of Agriculture, Western Cape for the excellent work they are doing in terms of relevant research to increase agricultural yields, but with fewer inputs.

Minister van Rensburg reiterated that "in the Western Cape, the largest slice of our biodiversity is in the hands of our farmers. It is therefore imperative to have a good working relationship with this sector, as we need to work side by side in order to protect our biodiversity on working farms. And we are already doing that." Minister van Rensburg mentioned the Landcare Programme responsible for recovering river embankments, working in partnership with land owners; the adaption of no-tillage practices, strongly advocated by the Western Cape Department of Agriculture (currently between 250 000 and 300 000 hectares of dry land crops are being cultivated in this way in the Western Cape); crop rotation and supporting the newly established body, Conservation Agriculture Western Cape, an initiative driven by farmers.

"A key joint initiative between conservation and agriculture is committing to Biodiversity Best Practice for farmers", said Minister Bredell. He continued by saying that "this project collated, developed and proposed a set of practical guidelines aimed at steering farming operations towards conservation of biodiversity and sustainable agricultural practices, including the protection of sensitive vegetation types, adherence to national legislation governing the management of natural resources, the establishment of core corridors and the sustainable utilisation of groundwater."

Minister Bredell also regards the new "Western Cape Game Relocation Policy" as a highlight in terms of the conservation of biodiversity, and also because it encourages the further growth of the "green" economy in the Western Cape. "This policy document was a direct result of Cape Nature's excellent capability to negotiate with the industry and work in partnership with them.

In addition to contributing towards one or more of our government's twelve Strategic Objectives, the winners' achievements may also have contributed in the following ways:

- they were innovative and creative ideas
- they drew new communities into conservation efforts
- was voluntary work and/or work "beyond the call of duty"
- left a legacy in the field of biodiversity conservation or made a significant and lasting impact in a short space of time
- lead to the development of effective new tools
- made a contribution to transformation and capacity development in the sector.

The three award winners for 2011 were:

- **Chris Martens**, for innovation and leadership in stewardship in the Cape Floristic Region
- **Marina Eihlers**, for passionately inspiring learners in the Central Karoo
- **Johan van Biljon**, for leading conservation and outreach in the Cape Winelands

The 2011 CAPE Partners Conference themed Conservation and Agriculture: A Common Agenda is currently taking place at Elsenberg.

Through its partnership, CAPE is showing how development and sustainable natural resource management are crucial partners in a green economy, and how we can protect biodiversity and ecosystem services while promoting development, economic growth and sustainable rural enterprises.

The Conservation and Agriculture sectors are custodians of the natural resource base, upon which the wealth of many South Africans are built. Ecosystem services and biodiversity are the natural capital that underpins economic growth and development in the Cape Floristic Region. Functioning ecosystem services underpin the vision of a Green Economy, which is one that results in improved human well-being & social equity, while significantly reducing environmental risks & ecological scarcities.

Healthy ecosystems enable society to cope with a number of challenges. South Africa has developed a growing practice using ecosystem approaches to environmental management

and climate proofing, such as: Riparian areas being reforested to stabilize rivers under high flow conditions; Alien vegetation being removed to improve the quality and quantity of water to serve human needs; Wetlands being restored and conserved to protect their functional role as carbon sinks; protect us from natural disasters like floods, fires and coastal erosion.

Background information

The Cape Floristic Region

The Fynbos Biome, or Cape Floristic Region, is a very special place.

It is the smallest of the world's six floral kingdoms, found mostly within the Western Cape. It covers nearly 90 000 km², stretching from the Cederberg to the Nelson Mandela Metropole, in the area between the mountains and the sea. In this relatively tiny area, there are 9 600 recorded plant species, 70% of them found nowhere else on the planet. This very special place is also one of the world's Global Biodiversity Hotspots – the most remarkable places on earth that are also the most threatened.

The Cape Action for People and the Environment Partnership: CAPE

The CAPE partnership programme is a unique internationally acclaimed mechanism that is showing us how we can protect biodiversity and ecosystem services while promoting development and economic growth.

The partnership was created through a principal MOU that was signed in 2002. In this MOU, our Ministers of Natural Resource Management Agencies at National and Provincial levels (including DEA&DP who were then DECAS) committed to cooperate to achieve the objectives of the CAPE and to implement the CAPE Strategy as expeditiously and effectively as possible.

Most importantly, CAPE aims to conserve and restore ecosystem services so that sustainable development and sustainable rural enterprises can be supported.

River Protection Works in die Hex River

Rudolph Röscher
LandCare
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Management
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During the November 2008 floods severe damage to farming infrastructure has been experienced as well as extensive erosion alongside rivers in the Cape Winelands District. Almost 80% of all damages that were listed occurred alongside river systems. This was almost to be expected since the deepest and best soils are commonly found in the flood plain of rivers. These soils are the first to be developed for high investment long-term crops such as deciduous fruit. Very little space is left undeveloped between the agricultural land and the low flow edge of water position. There is little space for rivers to meander in without the banks being eroded. The traditional braided river structures have mostly disappeared as rivers have become channelised. The popular belief of land-users is that the position of the river must be forced to remain constant. Historically farmers have bulldozed sediment out of rivers to "open" them and used the material to create levees along the sides of the rivers to prevent the river from meandering into the orchards. Alien vegetation have infested riverbanks and displaced indigenous vegetation which was better adapted to controlling erosion and thus dramatically increased the instability of rivers.

Since the flood and under the leadership of the Department of Agriculture's Sustainable Resource Management directorate several partners, including CapeNature, Agri WC, local irrigation boards and landowners created an Environmental Management Plan (EMP) for several rivers in the Cape Winelands. The EMP included the use of engineering groyne structures to stabilize the river banks and to clear alien vegetation and to restore indigenous vegetation.

The nature of groynes is such that if indigenous vegetation is restored in the spaces between the structures, it can eventually take over the function of river stabilisation. It also contributes significantly to the restoring of bio-diversity as a desirable variety of habitats get re-created along the river. The use of groynes is often referred to as "soft engineering".

One of the basic principles of planning groynes as erosion control works in a river system is to strive to achieve a situation where it is no longer necessary to bulldoze rivers (or in other ways to interfere with natural river processes) to keep floods from damaging agricultural land and infrastructure. This must be achieved by providing a reasonable width for a river system, removing alien vegetation and re-establishing indigenous vegetation, and where necessary, provide mechanical erosion protection structures.

It is essential to view the re-establishment of indigenous vegetation as an integral part of a river bank rehabilitation program. Reasons for establishing indigenous vegetation on the river bank are as follows:-

- By providing for the vegetating of the zone between the groynes, the designer not only roughens the riverbed hydraulically and reduces flow velocities, but also provides for the binding of the sediment within plant root matrices.

- Should the groynes be constructed with wire gabion baskets, although galvanized and possibly PVC-coated work as well, the wires will not last forever. By establishing a healthy vegetative cover the designer provides for the integrity of the riverbank after the structure has started to decay. For this purpose indigenous plant species have been proven to be far more effective for bank stabilisation purposes than alien species.
- Once the zone between the groynes has been vegetated, it is more likely to trap sediment than to release sediment during floods.
- Re-establishing river banks to indigenous vegetation contributes towards the ongoing process of restoring the ecology of the riverine habitat and biodiversity. This includes absorbing nutrients from the water, providing habitat, shelter and a base of the food chain for aquatic and other fauna and softening the impact of hard engineering.

To effectively re-vegetate the river bank, the bank has to be landscaped to a flat enough side-slope, preferably 1:3 or flatter, and at least to the 1:20 flood height. A suitably qualified botanist should recommend the choice and position of plants within different zones of the river bank.



During an informal information day several farmers and laborers received training on re-vegetation of river banks with indigenous plants. All the plants are from the Land-Care nursery where 6 women and 4 men are trained in nursery skills. Seeds and cuttings were harvested from the Hexriver and grown over 10 months at the nursery. During the farmers day 28 000 plants and thousands of seeds were re-established in between the newly constructed groyne structure in the Hex River.

Procedures to be followed when importing plants and plant products into South Africa



Before importing into South Africa, an importer should:

1. Find out the phytosanitary import conditions that apply to the commodity to be imported by consulting the Agricultural Pests Act, 1983 (Act No. 36 of 1983) or the National Plant Protection Organisation of South Africa (NPPOZA) within the Department of Agriculture, Forestry and Fisheries (DAFF).
2. Apply for an import permit from the DAFF if the commodity to be imported is not exempted from an import permit in terms of the Act referred to above. If the commodity to be imported is exempted from an import permit, ensure compliance with phytosanitary measures for such exemption.
3. When applying for an import permit, submit the completed application form together with proof of payment. The tariff information with regard to the issuance of import permits and the application form are available on the departmental website (www.daff.gov.za »Divisions »Plant health» Importing into South Africa).
4. Forward a copy of the import permit to the exporter or supplier in the exporting country to ensure that the consignment to be exported meets the phytosanitary import requirements of South Africa.
5. Ensure that the exporter or supplier presents the commodity to be imported to the National Plant Protection Organisation (NPPO) of the exporting country for phytosanitary inspection and certification where necessary in terms of the permit and/or exemption requirements.
6. Inform the exporter or supplier to send the original phytosanitary certificate with the consignment to South Africa (if a phytosanitary certificate is required).

Procedures to be followed when imported commodities arrive at the port of entry in South Africa:

1. South African Revenue Services (SARS) will detain the commodities for inspection.
2. DAFF inspector/s from NPPOZA will inspect the consignment together with the accompanying documents.
3. The following may happen following inspection of the imported commodities:
 - (a) If the consignment meets the import requirements, it will be released by the DAFF inspector/s.
 - (b) If the consignment does not meet the import requirements, risk management measures will be recommended whereafter a consignment may either be treated and released, sent back to the country of origin or destroyed. Once the consignment has been released by the DAFF inspector/s, the importer or his/ her agent must take the import documents to SARS for final release.

Postal address: National Plant Protection Organisation of South Africa (NPPOZA) • Department of Agriculture, Forestry and Fisheries • Directorate: Plant Health • Import Permit Office • Private Bag X14 • Gezina • 0031

Contact numbers: Tel +27 12 319 6102/ 6396/ 6130/ 6383 • Fax +27 12 319 6370 • E-mail JeremiahMA@daff.gov.za or AnitaSN@daff.gov.za or ShashikaM@daff.gov.za or BenJK@daff.gov.za

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agriculture,
forestry & fisheries

Department
Agriculture, Forestry and Fisheries
REPUBLIC OF SOUTH AFRICA



COLLEGE COUNCIL

A new council was appointed and will serve to promote the Elsenburg Agricultural College for the next three years. Their vision, mission and strategic objectives are:

Vision

The Vision is the continued advancement of Elsenburg Agricultural Institute as an agricultural and educational Centre of Excellence to the benefit of the broader agricultural community.

BACK (from left to right): Gerhard Martin, Dr George de Kock, Kosie Loubser
FRONT: Lizette Viljoen, Dr Christa van Louw (Chairperson), Prof Christo de Coning
ABSENT: Adv Mandla Mdludlu

Mission

- Promote sound integrated managerial and skills training in agriculture with advanced specialisation in area specific fields of excellence informed by industry and societal needs
- The role of the Institute is to provide quality professional and practical training informed by contemporary research through a market orientated approach in a developmental context

Strategic objectives

- Provide good strategic leadership and support to the Elsenburg College (now referred to as the Institute)
- Facilitate sound corporate governance with high levels of accountability, transparency and fairness
- Support transformation internally and externally in society
- Facilitate sound cooperative governance arrangements with high levels of co-operation between the government, private sector and civil society
- Further develop Elsenburg College as a Centre of Excellence as an Agricultural Training Institute, but also as a state of the art institution internationally with specific niche areas
- Promote Elsenburg College as an education institution with a clear agricultural focus.



From left to right: Marius van Aswegen, Western Cape Department of Agriculture, Manager Financial Accounting; Gerrit van Rensburg, Western Cape Minister of Agriculture and Rural Development; Floris Huysamer, Western Cape Department of Agriculture, Chief Financial Officer. Front left: Joyene Isaacs, Head of Western Cape Department of Agriculture; Debbie Zana, Western Cape Department of Agriculture, Manager, Management Accounting.

Western Cape Department of Agriculture crowned as best Department in South Africa

Petro Van Rhyn
 Head of Communications
 Department of Agriculture, Western Cape



Winner award by scoring an impressive 96.55% for its Annual Report. This is the highest score recorded in the 10 year history of the Awards. The Western Cape Department of Agriculture also won the award for the best Provincial Department.

Gerrit van Rensburg, Western Cape Minister of agriculture and Rural Development said he is extremely proud of this achievement. "Being recognised as the best department in the country is an exceptional honour. This achievement reflects the hard work being done in the Western Cape Government

"The Western Cape Department of Agriculture was recently crowned as the best department in South Africa for its annual reporting by the South African Institute of Government Auditors (SAIGA). The Department competed against other provincial and national departments and walked away with the coveted Overall

BEWARINGS-LANDBOU KRY MOMENTUM

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Die foto van die komitee:

- Agter:**
 Francis Steyn (DLWK), Jacobus Human (boer), Abri Richter (boer), MG Lötter (boer), Johann Strauss (DLWK, sekretaris), Chris Cumming (gekoöpteerde lid)
- Voor:**
 Amelia Genis (Landbouweekblad), Sandra Lamprecht (LNR), Dirk Lesch (boer), Kobus Schonken (boer), Pieter Swanepoel (DLWK), Johannes Schoonwinkel (boer, voorsitter)
- Afwesig:**
 Prof Andre Agenbag (US), Junior Herholdt (boer)

Die belangrikheid om ons natuurlike hulpbronne te bewaar is 'n globale prioriteit. Dit is ons elkeen se verantwoordelikheid om ons deel te doen om te verseker dat ons kinders se kinders ook eendag die nut van ons hulpbronne het.

'n Besoek aan Argentinië in 2010 saam met Landbouweekblad het navorsers van die Departement van Landbou Wes-Kaap se oë laat oopgaan om te sien hoe boere en navorsers saamwerk in een gemeenskaplike vereniging om bewaringsboerdery in sy vele fasette te bestuur. Dit het gelei tot die stigting van 'n bewaringsbewerkingvereniging vir die Wes-Kaap op die 8ste Junie 2011. Die vereniging, wat voortaan bekend sal staan as Bewaringslandbou Wes-Kaap het ten doel om 'n brug te bou tussen boere, navorsers en landboubedrywe om sodoende bewaringslandbou in die provinsie te ondersteun en te laat uitbrei. Mnr Johannes Schoonwinkel, boer van Swellendam, is as voorsitter van die leidskategorie gekies. Die komitee is saamgestel om die vereniging se bedrywighede te koördineer en sodoende die vereniging verdere stukrag te gee.

Verskeie aksies word beplan vir die komende jaar, waaronder "groentoeë" na plase, 'n algemene jaarvergadering en konferensie

vroeg in Junie 2012. Daar word ook gekyk na die moontlikheid van die verskaffing van gratis opleiding van voorligters en plaaswerkers om sodoende die kennis uit te brei ten opsigte van aspekte soos bewaringsbewerking en die veilige gebruik van landbou chemikalië.

Samewerkingsooreenkomste met soortgelyke bewaringslandbou-organisasies in Australië, Argentinië en andere word ook ondersoek. Sedert die leidskategorie op die been gekom het, word 'n maandelikse nuusbald uitgegee waar praktiese aspekte van bewaringslandbou aangespreek word.

Die vereniging is oop vir enige iemand wat betrokke is in die landbou arena en bewaring van sy of haar natuurlike hulpbronne op die hart het. Belangstellendes kan die vereniging se sekretaris, Dr Johann Strauss, skakel vir inskrywingsvorme of om meer uit te vind aangaande die vereniging.

Die vereniging dra ook sy dank hiermee oor aan Landbouweekblad wat hierdie inisiatief ondersteun en wye publisiteit aan sy aksies gee.

and also at the Department of Agriculture. This award was earned through the Departments culture of relentless drive to keep on improving".

Van Rensburg said this award is also reflected in the manner in which the Department goes about its day-to-day business. "An organisation that is excellent in its reporting and accounting activities must also be excellent in rolling out its services at grass roots level. This is true for the Western Cape Department of Agriculture"

The Western Cape Department of Agriculture was praised by the Executive President of the SAIGA awards, Professor Dieter Gloeck, for its commitment to effective and accountable reporting.

The Southern African Institute of Government Auditors (SAIGA)

introduced important awards in the public sector ten years ago to recognize the pursuit of excellence in annual reports published by national and provincial departments.

The Annual Public Sector Reporting Awards produces 12 awards in total:

- One for the best report of a national department
- One for the best provincial department (for each of the nine provinces)
- One for the most consistent highest score over the last three years
- A twelfth award is made for the Department obtaining the overall highest score.

Wes-Kaapse navorsers kuier by die OEWERKONYNE in die Noord-Kaap



'n Navorsingsgroep van die Instituut vir Plantproduksie en Nortier Navorsingsplaas het in Junie 'n besoek aan die Oewerkonynhabitat-rehabilitasieprojek op Loxton in die Noord-Kaap gebring op uitnodiging van Ryno Erasmus, 'n senior veldbeampte (Foto 1). Die projek, wat deel vorm van die Oewerkonyn Werkgroep, onder beheer van die Trust vir Bedreigde Natuurlewe, bedryf hier 'n kwekery waar hulle saad en plante inheems tot die habitat van die Oewerkonyn vermeerder. Hierdie plante en sade word dan weer gebruik om gedegradeerde Oewerkonynhabitate te rehabiliteer op plase waar boere wel 'n rol wil speel in die bewaring van die konyne. 'n Verdere oogmerk is ook om bykomende korridors te skep tussen die bestaande gunstige habitate wat geïsoleer van mekaar geleë is, om sodoende migrasie en oorlewing van die Oewerkonyn te bewerkstellig, veral in die lig van verwagte klimaatsverandering in die streek.

Die projek kweek plante van ongeveer 10 verskillende plantspesies eie tot rivieroewerhabitat en hoofsaaklik van die meer smaaklike en meerjarige plante, wat nie maklik op hul eie vestig in versteurde gebiede nie. Dit sluit in Klappiesbrak, Draaibos, Kapokbos, Ganna en Ankerkaroo/Skaapbos. Die saad is aanvanklik in die veld geoes en dan in saadbakke en saailaai by die kwekery gesaai. Vandaar word hulle uitgeplant in plantsakkies (Foto 2) en dan in die veld waar die groepie spesifieke rehabilitasieprojekte aanpak. In sommige gevalle kry die boere plantjies by die kwekery en doen self die rehabilitasie werk op hulle plase met aanbevelings van die veldbeampte. Intussen is 'n stuk grond skoongemaak by die kwekery en bogenoemde plante aangeplant om saad te voorsien vir die projek (Foto 3). Huidiglik is die kwekery nog 'n klein projek, maar is besig om uit te brei soos meer grond-eienaars bewus raak van die beskikbaarheid van plante en die diens wat hulle lewer en ook betrokke wil raak in die bewaring van die Oewerkonyn.

Die Oewerkonyn is 'n krities bedreigde spesie wat baie habitat-spesifiek is en waarvan die getalle baie laag is. In die afgelope 30 jaar is hulle slegs 300 keer gesien oor die hele verspreidingsgebied. Hulle kom voor in rivieroewerhabitat waar Gannas dominant is en waar die veld nog in 'n goeie, onversteurde toestand is. Hierdie tipe habitat is egter baie beperk en grootliks versteur. Hulle verspreidingsgebied strek huidiglik van min of meer Victoria-Wes in die ooste tot by Touwsrivier in die weste en van Loxton in die noorde tot by Montagu in die suide. Die Oewerkonyn teel egter geensins aan soos die spreekwoordelike konyne nie! Hulle kry slegs een kleintjie per jaar en leef ook net 3 tot 4 jaar, wat hulle nog meer vatbaar maak vir uitsterwing.

Die Oewerkonyn het kenmerkend 'n wit kring om die oog, wat by geen ander hase of konyne gevind word nie en hulle het ook geen wit op die res van hulle lyf nie (Foto 4). Die werkgroep maak

grootliks staat op mense wat aanmeld indien hulle 'n Oewerkonyn sien, so lesers kan hulself vergewis van die kenmerke van die konyne om sodoende moontlike verskynings te kan aanmeld. Selfs konyne wat op paaie doodgery word, kan ondersoek word om vas te stel of dit 'n Oewerkonyn was, wat 'n aanduiding kan gee van die omvang van die huidige verspreidingsgebied.

'n Belangrike aspek van die besoek was ook die uitruiling van inligting, aangesien die Departement van Landbou Wes-Kaap'n soortgelyke kwekery bedryf op Worcester Veldreservaat en bykomend ook nou besig is met die ontwikkeling van 'n kwekery op Nortier navorsingsplaas by Lambertsbaai. Die Worcester Veldreservaat was ook destyds betrokke by die aanvanklike opleiding van die personeel van die Oewerkonyn kwekery.

Vir meer inligting rakende die Oewerkonyn en verwante projekte, kontak Ryno Erasmus by rnoe@ewt.org.za. Vir meer inligting rakende die kwekery by Worcester Veldreservaat, kontak Hannes Botha by 023 347 1121 en vir die Nortier Navorsingsplaas, kontak Christie Rheeder by 083 641 0703.



Developing an OPERATIONAL REMOTE SENSING SYSTEM for monitoring of efficient crop water use of grapes in the WESTERN CAPE PROVINCE

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1 Introduction

Availability of water resources and good water management practices are well acknowledged global challenges for the years to come. These issues are particularly acute in dry countries. In South Africa, water is a critical resource and there is strong competition between the urban, industrial and agriculture sectors. In the Western Cape, it is estimated that irrigated agriculture is responsible for 43 % of the water usage from surface water resources. There is thus a need to ensure the efficient use of irrigation water. Because of increased demand and competition for limited water resources, the challenge is to increase agricultural production while reducing water consumption.

The production of table and wine grapes represents a major sector in the Western Cape and therefore optimal use of irrigation water in this sector is of importance. A number of information sources can facilitate this. The utilisation of satellite earth observation data has already proved to be successful in assessing water use and water use efficiency of vineyards in the Western Cape province of South Africa in a previous project. These information sources also have the potential to assist farmers in optimising the use of irrigation water, if produced at frequent intervals over the grape producing season. A demonstration project was launched to do that - provide farmers and irrigation consultants with frequent updates on crop water status, growth and nitrogen status. The operational system that delivers this information during the demonstration project integrates information derived from satellite earth observations and in situ measurements into maps and graphs. The information was disseminated through a website and SMS services.

Evapotranspiration (ET) refers to two separate processes – (1) transpiration losses by vegetation and (2) evaporation of water from surfaces (soil, plant-intercepted, water bodies). Irrigation application is the amount of irrigation water applied to a block (intentional water use).

2 Goal and Objectives

The goal of the project was to test an operational service that has the potential to improve the water use efficiency of table and wine grapes produced in the Western Cape, South Africa. This operational service was to provide online (web-based) access to information relating to crop water, growth and nitrogen status, for the period 1 September 2010 to 30 April 2011 for all major grape producing areas of the Western Cape.

Specific objectives were to:

- Provide weekly updates of spatial information in the form of maps on parameters such as crop growth, evapotranspiration and evapotranspiration deficits and crop nitrogen status for irrigation blocks and farms,
- Forecast soil moisture change over a five day period after satellite image acquisition for a selected number of irrigation blocks of participating farmers, and
- Disseminate this information through a website (www.Grapelook.co.za) accessible to all (farmers, irrigation consultants, etc.).

The study area covers vineyards (1) around the towns of Stellenbosch, Somerset West, Paarl, Wellington and Franschhoek in the Berg River catchment; (2) around Worcester and De Doorns in the Breede River catchment; and (3) around Citrusdal, Vredendal and Klawer in the Olifants/Doorn River catchment.

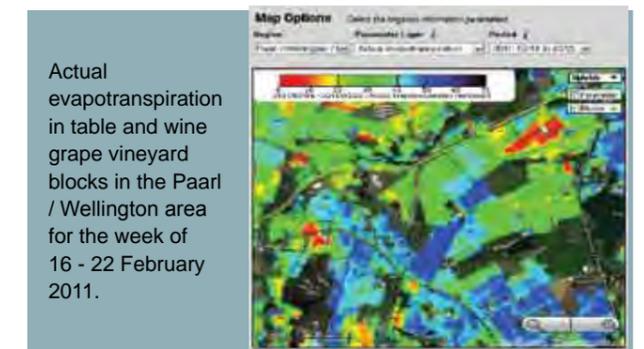
3 Information provided on the website

The following information was provided through parameter maps on a weekly basis to everybody visiting the web site

- Actual evapotranspiration [mm/week]
- Evapotranspiration deficit [mm/week]
- Crop coefficient
- Biomass production [kg/ha/week]
- Biomass water use efficiency [kg/mm/week]
- Leaf area index
- Nitrogen content [kg/ha]
- Aspect

In addition site specific information a forecast was provided for the vineyard blocks of the participating farmers. These forecasts contained information on:

- Soil moisture available in root zone (mm or %)
- Transpiration deficit (mm/day or %)
- Irrigation water requirements (mm/day)



4 The way forward

The Grapelook website ran in a demonstration, though fully operational mode, from 1 September 2010 until 30 April 2011. In this demonstration phase it was proved that this approach and the accompanying technology could be applied on a weekly basis and that the end-users were interested in the information posted on the website. This information can be used to increase the water use efficiency of irrigation farmers and thus contribute to ensure sustainable farming in our province whilst contributing to the objective to save 10% of irrigation water use by 2014.

It is planned to have the website operational again for the 2011/12 irrigation season and to also include other crops such as a deciduous fruit.

Invloed van grondbewerking en wisselbou op gewasresidu oordrag en persentasie bedekking

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Gedurende 2007 is 'n langtermyn studie begin waarin gepoog word om die effek van grondbewerking en wisselbou op die chemiese, fisiese en biologiese eienskappe van grond te kwantifiseer. Deur parameters te identifiseer wat die volhoubaarheid van grondbenutting beïnvloed, kan wetenskaplik gefundeerde bestuursnorme ontwikkel word om te verseker dat grond as natuurlike hulpbron bewaar word. Hierdie studie is gebaseer op verminderde bewerking, stoppelbewaring en wisselbou en die invloed daarvan op grond as natuurlike hulpbron. Die graad van versteuring word bewerkstellig deur vier bewerkingstelsels. Die stelsels wissel tussen geen versteuring (zero-bewerking) en maksimum versteuring waar 'n ploegaksie in Mei volg op 'n tandbewerking in Februarie/Maart waarna geplant word (konvensionele stelsel). Twee ander bewerkingstelsels, naamlik geen bewerking (maksimum 20% versteuring met plant) en minimum bewerking (een ligte tandbewerking in Februarie of Maart gevolg deur plant) word ook by die studie ingesluit. Gewasse word in 'n vierjaar siklus verbou as koring monokultuur (WWW), koring-medic/klawer (WMC) en koring-canola-koring-lupien (WCWL) stelsels. Hierdie stelsels word te Langgewens en Tygerhoek navorsingsplase van die Departement van Landbou Wes-Kaap ondersoek en kommersiële implemente word gebruik om die behandelings toe te pas en die gewasse te bestuur.

Bedekking 'n belangrike komponent van bewaringsboerdery

Een parameter waaraan die sukses van bewaringsbewerking gemeet kan word, is die persentasie bedekking van die grondoppervlakte met gewasresidue (plantresidue bestaande uit stoppel en gewasreste) soos bepaal direk na plant. Die bedekking gee 'n goeie aanduiding van die hoeveelheid plantmateriaal wat tussen seisoene oorgedra word. Dit is algemeen bekend dat plantresidue op die grondoppervlak waterinfiltrasie verhoog en dus ook sal bydra om gronderosie te beperk. Meer grondwater sal ook beskikbaar wees vir die gewas wat verbou word. Plantreste op die grondoppervlak beperk verder ook die negatiewe impak van die vallende reëndruppels wat tot toeslaan of korsvorming mag lei. Korsvorming kan opkoms en gaswisseling nadelig beïnvloed en dus ook gewasprestasie. Bewaringsbewerking het dus gewoonlik tot gevolg dat groter hoeveelhede biomassa (wortels ingesluit) geproduseer word. Die gevolg hiervan is potensiele verhogings in grondkoolstofvlakke, 'n belangrike eienskap van produktiewe grond.

In die verlede was groot hoeveelhede stoppel tydens die plantproses 'n probleem met planters wat nie die stoppel kon hanteer nie. Daar was dus op groot skaal ontslae geraak van stoppel, hetsy deur te brand, baal, beweiding asook inwerk deur ploeg of sny-aksies. Met bogenoemde bestuurspraktyke is die koolstofinhoud van die grond laag gehou as gevolg van die min organiese reste of waar grond bewerk is, die versnelde afbraak van organiese koolstofbronne.



Foto 1: Planters is beskikbaar wat enige saad effektief in grondwatbedek is met groot hoeveelhede plantreste kan plant. Hier word die AUSFLOW gebruik om direk in koringstoppelin die geenbewerkingstelsel te plant. Links van die planter kan die onversteurde stoppel van die vorige jaar se koring, waarindirek geplant word, gesien word.



Foto 2: Die zero bewerking plant aksie. Let op dat geen versteuring van die grond agter die planter waarneembaar is nie.



Foto 3: Die tand implement wat gedurende Februarie/Maart in die minimum en konvensionele bewerkingstelsels gebruik word.

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Some insights into the Medicinal Plants Industry in the Western Cape

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1. Introduction

The lack of support in the commercialisation of the medicinal plants industry is reported as a major challenge by people involved in trade. As a result, these people lose the potential benefits they may enjoy from trading with these plants. In the Western Cape, the medicinal plants industry approached the Provincial Department of Agriculture to assist in addressing some challenges the industry face. Due to the lack of information the Department decided to initiate a study aimed at gaining some first hand information about the industry.

The study was conducted in the Western Cape Province. The aim of this research study was to gather information about the medicinal plants industry. The information received in this study would be the initial thrust used to develop a support strategy, provide advice and identify some marketing opportunities to medicinal plant farmers in the Province. The Department of Agriculture (DoAWC) started with its research mid-2010. It involved obtaining as much information as possible on the medicinal plants industry. This article contains some relevant primary and secondary information that relate to medicinal plants farming in South Africa, specifically in the Western Cape Province. It serves as a guide as to how the DoAWC and other stakeholders could support the medicinal industry in the Western Cape.

2. Literature review

Herbal medicine is the oldest form of healthcare known to mankind and has been used by all cultures throughout the history around the globe. Currently, it is estimated that more than 25% of almost all modern medicine are directly or indirectly derived from medicinal plants. The World Health Organisation estimated that more than 80% of populations in developing countries depend primarily from traditional medicine for health care needs (Loundou, 2008).

Beside, the provision of health care needs, the industry plays an important role in job creation in South Africa. The FAO (n.d) implies that the collection of medicinal plants provides complementary sources of cash for many extremely poor households worldwide. It is estimated that there are about 133 000 people employed in the medicinal plants trade (Mander et al., 2006).

The demand for medicinal plants is increasing and predicted to remain high in the future. The demand for certain plants exceeds the supply, with traders reporting acute shortages and price increases (Dold & Cocks, 2002). In order to meet the demand and consistency of supply for medicinal plants, Sher et al., (2010) suggested that the cultivation of plants should be considered. This is supported by the supply of medicinal plants that is declining. According to Mander (1998) this decline in supply is associated with significant economic and welfare losses when considering the large number of people who either consume or trade indigenous medicinal plants.

The industry supplies both local and international markets. The local market includes street traders, supermarkets, local communities and pharmaceutical companies (Mander, 1998). Internationally, the most important import countries include Hong-Kong, USA, Spain, Korea, France, China, Italy Pakistan, Spain, United Kingdom and Malaysia. The export countries include China, Hong-Kong, India, Mexico, Germany, USA, Egypt, Bulgaria, Chile, Morocco, Albania and Singapore (Lange, 2006).

In the Western Cape it was estimated that more than 170 species were recorded to be traded or consumed. The bulk of these species is sourced in its natural habitat and is harvested on monthly basis (Loundou, 2008). Moreover, it was also revealed that the Western Cape is contributing in the world supply with plants such as Buchu, Hoodia e.t.c. but due to a lack of policies and proper marketing strategies the plants do not stay long in the international markets. In case of Hoodia the species enjoys good acceptance internationally but due to the lack of proper marketing some sub-standard products were supplied to markets and this ruined the reputation of the South African medicinal plant industry.

3. Research Methodology

The analysis in this study is based on the results of both primary and secondary data that was collected through a literature review as well as in-depth interviews with farmers in Franchhoek. The literature was collected to get an idea of the work already done within this topic and to identify possible information gaps. The data was collected from libraries, the internet and published articles. The interviews were conducted with a sample of three farmers in Franchhoek. The interviews were audio taped and lasted on average 20 minutes per interview. A semi structured questionnaire was used to collect the primary data.

The taped data was then downloaded to a software system and full transcripts of the interviews were made. From this a summary was drawn. A report was then written from the summary that was developed from the full transcription.

4. Research results

This section briefly provides the results of the interviews taken with medicinal plants growers in Franchhoek. It will highlight the challenges and the opportunities that the growers are facing in this industry.

The growers revealed that the trading of medicinal plants is their primary source of income. They indicated that the failure of medicine farming can result in severe poverty to producers. The respondents indicated some challenges they face that may lead to the failure of this industry in the Western Cape. These challenges included a lack of resource (production, financial), unavailability of skills, lack of production know-how, lack of government support and a lack of transport.

4.1 Lack of Production resources

All respondents mentioned some equipment that they lack in order to produce their products namely agricultural land, spades, forks, rakes, water, side netting, scissors, tractors, compost, hormone powder and weed eaters. In addition, one respondent suggested that compost and hormone powder are crucial when a farmer intends to produce Lavender and Malpha on a bigger scale.

All respondents also mentioned that it is very difficult to access land resources. The demand for medicinal plants is very high and forces the farmers to produce more but due to a lack of land, the farmers find it difficult to meet this growing demand.

4.2 Lack of Financial resources

All the respondents disclosed that their main problem is the unavailability of financial resources. They complained that it is difficult to access financial markets due to their capacity and ability to refund to refund financial institutions. They further mentioned that this makes it difficult to pay for inputs and all other business operations.

4.3 Unavailability of skills

It was clear from all respondents that the unavailability of skills is another challenging factor hindering the operations of medicinal plants farmers. The respondents mentioned among other the lack of skills such as production skills (specifically medicinal plants), processing skills, marketing skills, business management skills, communication skills, negotiation skills, leadership skills, conflict resolution skills and financial recording skills. Two respondents further mentioned that the lack of financial management and computer literacy skills forces them to keep records manually and this sometimes makes them lose the information since it is difficult to keep papers.

4.4 Lack of Transport

Moving the product from the farm to the market is the responsibility of the farmers. They mentioned that some markets come and collect the products at the farm but they charge the farmers for this service. In most cases if the farmer does not have transport means, the farmer ends up suffering financially from the high cost of transportation.

All respondents mentioned that transport is one of the major challenges that burden them. It was also mentioned that some of markets are approximately 600 kilometres far from the farmers and this makes it difficult to transport the product. In some cases, the marketing agreements are reached with the markets but due to a lack of transport the products end up not being delivered. Moreover, the respondents said that it would be a very big relieve if they can access affordable transport.

5. Conclusion

The paper revealed that the medicinal plants industry has the potential to change the lives of South African citizens as it provides complementary income opportunities and opens business opportunities for those involved in trade. It also provides complementary medicines especially to rural communities.

Although the industry shows these promising benefits, the growers are challenged by a general lack of resources, skills and support from government institutions. This becomes problematic to people who depends on traditional medicine as they fail to produce and maintain their income earning opportunities. It is therefore, recommended that further research should be conducted especially in the area of marketing possibilities as well economic viability studies of the major medicinal plants species.

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A soil quality assessment framework for kikuyu-ryegrass pastures

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Introduction

Agricultural soil has always been assessed visually classifying it as good, poor, productive or degraded soil. Historically, soil quality has been linked to productivity of crops and emphasis fell on the impact of management and not necessarily on soil quality per se. Modern science is pertinent in almost all functioning systems on earth, equally pertinent on soil and soil functioning. Southern Cape farmers and researchers recognize the importance of a science-based means to predict soil quality and expressed the need for detailed research in this field. In order to manage, maintain or enhance soil to an acceptable condition to be used by future generations, there should be a scientific definition of soil quality, broad enough to include sustainability, environmental quality, animal and human health.

Finding one universal definition of soil quality has been extremely difficult, due to the fact that it is confounded by countless circumstances. These circumstances do not only include factors such as the physical location and pertaining management practices, but is also subject to political, economical and social influences. These factors have led to the existence of numerous, sometimes conflicting, definitions for soil quality. The definition of Karlen et al. (1997) is one of the most universally used definitions for soil quality and will also be adopted as a benchmark definition for this particular research study. This definition states that soil quality is "the fitness of a specific kind of soil, to function within its capacity and within natural or managed ecosystem boundaries, to sustain plant and animal productivity, maintain or enhance water and air quality, and support human health and habitation".

Mentioning the term soil health will have some merit at this stage. Soil is seen as a living entity, and therefore the term soil health can be used to describe the state or condition of the soil. Soil health (also referred to as 'soil condition') is a term used more frequently as a laymen term, and often synonymously to soil quality. Farmers favour the term soil health descriptively referring to the soil as healthy or unhealthy, portraying the soil as a living and dynamic entity, whose functions are mediated by a complex interrelationship of biota that require management and conservation. Researchers, conversely, use analytical measurements to connect soil function and specific soil properties and therefore prefer the term soil quality. It is suggested that soil health and quality should not be used interchangeably in scientific reasoning. The soil health should be expressed as the condition of the soil at the time of sampling, whereas soil quality should be a fixed ability of the soil to perform.

The need for standards

The coastal region extending from the Tsitsikamma in the east to Caledon in the west is the highest milk producing area from planted pastures in South Africa. The most suitable management activities for pasture-based dairy production systems in this area have been well documented, mostly on

Outeniqua Research Farm near George. The systems are mainly permanent no-till kikuyu based pastures, over-sown with different ryegrass species and varieties. When growth rate and quality of kikuyu decrease during autumn, the ground-cover consists of stolons and rhizomes, which is mulched to prevent the kikuyu from building up an unpalatable matt of poor quality roughage, create a proper seedbed within the mulched material and decrease the competition of the kikuyu. It is subsequently over-sown with different ryegrass species and varieties. Ryegrass species, that are recommended, are temperate, high quality grasses, used to reinforce the kikuyu during colder seasons, when kikuyu is dormant.

These no-till systems were adopted to be more cost-effective and increase soil fertility by building soil carbon (C) levels. It is commonly observed that pastures that remained undisturbed for more than seven years have C stocks of 4% - 10%. Carbon stocks this high will have a substantial effect on the soil's quality and soils with established pastures are therefore generally classified as an excellent quality. There are, however, many concerns raised on the sustainable use of natural resources within the current no-till systems. An example is the high fertilizer N recommendation rate, which is too high to keep the soil healthy over an extended period. Dr. Philip Botha, Specialist Scientist on Outeniqua Research Farm, has also hypothesized that the soil should be renewed by cultivation once in seven years, depending on the system and pasture management, since kikuyu builds an unpalatable matt over time, adversely affecting pasture productivity.

It is not possible to predict sustainability of the system if a definition and assessment framework for soil quality have not been developed. Soil quality indices have become customary internationally as a science-based means to predict and support sustainability of resources. Even though there has been numerous projects performed worldwide, there is no suitable indexing system for South African conditions. This necessitate that soil quality must firstly be defined for dairy-pasture systems. Secondly, an assessment framework to predict the current status of the soil in terms of quality should be developed by optimizing the interrelated physical, biological, and chemical components of soils by means of management activities. Cultivation practices influence the three aforementioned components, which impose that the impact of management on soil quality needs to be examined. Cultivation practices may have a pronounced effect on the biological, chemical and physical balance of a system. Investigating the effect of cultivation practices on the quality of the soil will lead to a better understanding of the interactions of biota within their abiotic environment and the subsequent effect on sustainability of the system.

Farmers, agricultural researchers and conservationists alike, realize the importance of managing soil as a non-renewable natural resource that need to be conserved and maintained to ensure sustainability. It is important that conservation of soil must still be achieved while the system remains profitable. These

factors have increased the interest of farmers in assessing the quality of their soils and in implementing sustainable soil management practices.

The aim of this study is to investigate the effect of cultivation practices on soil quality in the southern Cape. Subsequently an assessment framework and index to predict the current status of the soil in terms of quality will be developed.

Approach for soil quality research in the southern Cape

The land-use zones within different ecological areas (areas with similar climate and rainfall, geography and soil) need to be defined in terms of prominent management factors prevailing on the area, natural resource characteristics and climate. Soil quality needs to be defined at each different land use zone. This is an important part as it will set targets, thresholds and critical limits for each land use zone. An example of the importance of

the different areas being assessed separately is the comparison between the Katspruit and Podzolic soil forms on Outeniqua Research Farm. Soil C contents as high as 7.5% have been recorded within the Katspruit soil type, whereas the maximum soil C content of the Podzolic soil forms are 4.5% C. Even though the Katspruit soil form has a much higher soil C content, the productivity remain lower compared to that of the Podzol. It is therefore important to have different benchmark values and critical limits for the two soil types.

To simulate different land use types, six treatments will be performed on Outeniqua Research Farm. Five treatments consist of different cultivation practices on a highly productive pasture consisting of permanent kikuyu based pasture, over-sown annually with ryegrass to reinforce the kikuyu during dormant months. The sixth treatment is the control, on native soil with natural veld. A brief summary of the treatments are shown in Table 1.

Treatment nr	Treatment name	Applicable species	Method
1	Pure kikuyu sward	Kikuyu	1. Graze to 50 mm
2	Herbicide	Ryegrass (kikuyu will re-emerge later)	1. Graze to 50 mm 2. Spray with herbicide 3. Aitchison seeder 4. Land roller
3	Over-sown	Kikuyu-ryegrass	1. Graze to 50 mm 2. Mulcher 3. Aitchison seeder 4. Land roller
4	Shallow disturbance	Kikuyu-ryegrass	1. Graze to 50 mm 2. Rotavator 3. Aitchison seeder 4. Land roller
5	Maximum disturbance	Kikuyu-ryegrass	1. Graze to 50 mm 2. Ripper (2x) 3. Offset disc plough 4. Disc harrow 6. Aitchison seeder 5. Land roller
6	Control	Natural virgin veld (Fynbos)	N/A

Table 1: A brief comparative summary of the treatments

When those land use types have been identified, an evaluation of a wide spectrum of chemical, physical and biological indicators that can potentially be used should be performed on each treatment. An indicator of soil quality is a parameter that

corresponds to properties of the environment, which can infer information beyond that of the measured parameter alone. These indicators are a means of information on the normality in function of soil. Different indicators cover multi-functional properties regarding soil quality or in other words, reflect the capacity of the soil to function. The indicators that will be tested on each treatment are shown in Table 2.



Chemical	Physical	Biological	Other
Soil organic matter (Loss-on-ignition)	Aggregate stability	Basal soil respiration rate	Soil temperature (various depths)
Active C (Walkley-Black)	Texture (5 fractions)	Glomalin content	Soil matrix potential
Macro and Micronutrients: P (citric acid), K, Ca, Mg, B, Cu, Co, Fe, S, Mn, Al, Zn, Na, C:N, C:S	Bulk density	Nematode community profiling	Continuous soil moisture content
pH(KCl)	Water holding capacity	Micorrhizial root colonization level	Botanical composition
Electrical conductivity	Soil depth	Spore count	Water quality
Cation exchange capacity	Rooting depth and density	C-source utilization profile (BIOLOG®)	Pasture yield
Total N, Ammonia-N	Penetration resistance	Microbial enzyme activity	Climate related parameters
Resistance	Infiltration rate	Microbial count	
Total cations		Microbial biomass-C	

Table 2: Parameters that will be examined to develop an assessment framework for soil quality

The second component of the study will be conducted on a regional scale, extending from the Humansdorp area of the Tsitsikamma in the west, to the Swellendam area in the Overberg in the east. Sites on dairy farms will be selected throughout the entire region if the applicable criteria apply. Subsequent to the data collected, biometrical procedures will be followed to develop an index to predict soil quality.

Applications and outcome

The interactive and dynamic responses of soil components, including the biological component that is not visible to the naked eye, have not been investigated and will contribute to the knowledge base of how soil acts as a living resource. This will give farmers a better understanding of what processes is occurring in the soil, where it is only a guess at this stage. Management can be adapted accordingly to ensure sufficient status of soil condition over the long-term.

To enable farmers to make educated decisions regarding the management activities that are performed on-farm, they need tools that allow them to predict what the consequences will be of their actions. The index that will be generated from the research conducted will serve as a simple model that allows farmers to predict changes in soil health and associated crop productivity. Risk and productivity losses can be predicted by tracking the changes in soil health, especially in an environment where global warming are a reality that are currently prevailing.

The index and application thereof will be extended by the Department of Agriculture Western Cape through training days,

pasture courses, information days and conferences.

Changed or adapted management scenarios needs future investigation to explore the consequences of imposing new management practices on soil conditions and future productivity. Research on decreasing nitrogen application should receive special attention. Expanding the index by improvement of the sensitivity thereof will likely result from a second generation index.

Conclusion

Farmers and agricultural researchers alike, realize the importance of managing soil as a non-renewable natural resource that need to be conserved and maintained. There is a great need both to determine the status of and to enhance soil health. This research will be used by farmers to evaluate and redesign management strategies which will ensure sustainability of soil while the system remains profitable.

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ADDING FUEL TO THE FIRE: a macro perspective on biofuel production in South Africa

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Why the interest?

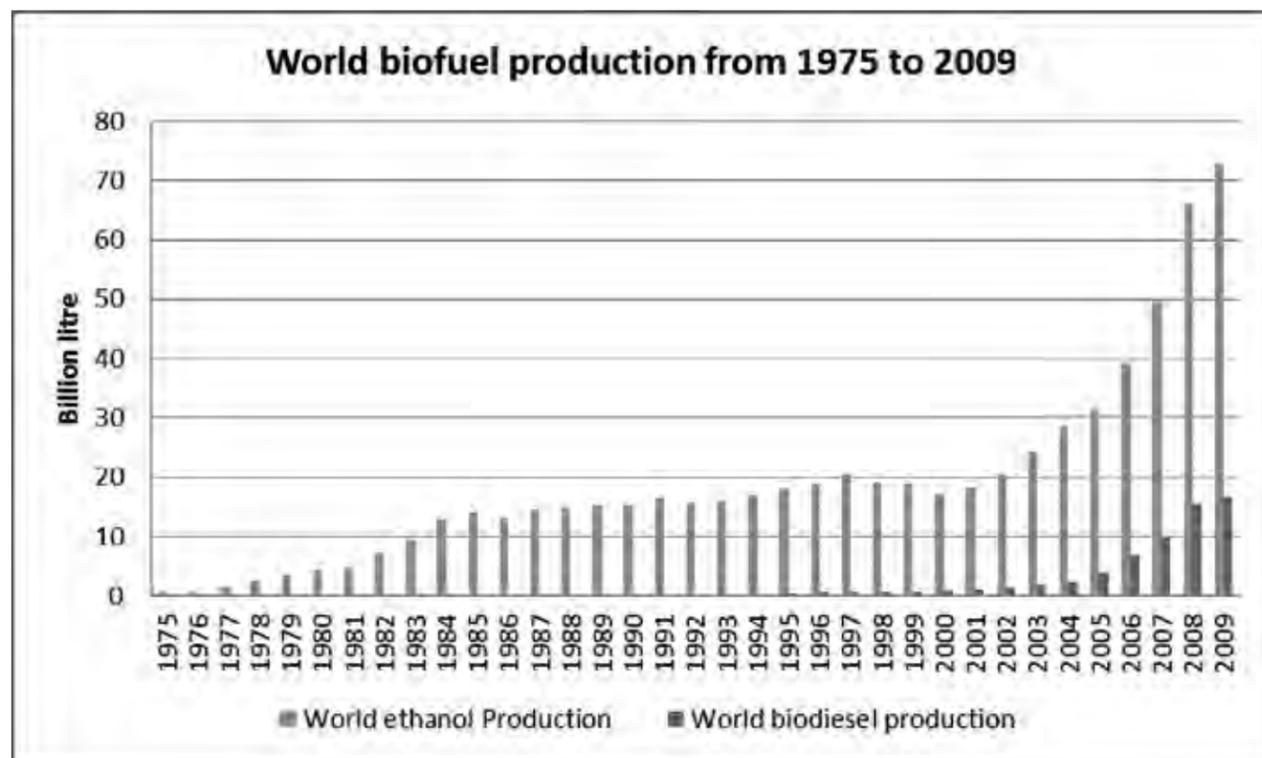
Energy security, support for agricultural and rural development, a reduced dependence on fossil fuels, and a reduction of greenhouse gas emissions are often cited as arguments for encouraging biofuel production (Sims et al. 2009). In South Africa, the effect of the reduced crude oil price was seen in the halting impact it had on bioethanol production from sugarcane that took place from the 1920s to 1960s (DME 2007; Eisentraut 2010). Today, oil price volatility and concerns about climate change is sparking new interest in the field. In addition, the global economy is expected to become more sensitive to 'green' production practices, encouraging businesses to incorporate an environmental awareness into their marketing strategies.

In South Africa, investment in biofuels is often promoted by the opportunities it may hold for the development of rural

areas and the new employment opportunities it can create. Biofuels may also increase farmer income through providing an alternative source of off-take for agricultural produce. But there is no such thing as a free lunch and these benefits will likely come at a cost. This article deals with developments in the global biofuel market, the potential of second generation biofuel production in South Africa, and the externalities associated with the development of a national biofuel sector.

Development of the global biofuel sector

Global biofuel production has grown strongly over the past decade but has remained limited to a few countries. The United States and Brazil make up the largest proportion of global biofuel production. Combined, they are responsible for 93% of bioethanol produced, and 39% of biodiesel.



Data source: (Earth Policy Institute 2011)

Maize-based ethanol is the most common biofuel produced in the United States, but (in addition to concerns about global food security) environmentalists complain saying that it is grown in large monocultures using harmful chemical fertilisers with only minimal emission reductions when it is refined in a coal-fired plant (Groom et al. 2008). Although this provided a good kick-start for the American biofuel industry, alternatives will have to be found if environmental benefits are to be maximised. The United States subsidises bioethanol as well as protects domestic production through an import duty.

Some have gone so far as to label the ethanol industry as a farm support policy rather than environmental policy, but it seems that the Senate have heeded the warnings: in June 2011 they voted for both the subsidy and the import duty to be abolished (although this is yet to become law), motivated by environmental concerns about water and energy use during production, and the increased food prices resulting from farmers devoting more of their crops toward the ethanol market (The Economist 2011).

Initiated during the first oil crisis in 1973, Brazil's biofuel programme has allowed them to reduce their oil imports from 70% to 10% over the past thirty years, substituting oil with bioethanol produced from sugarcane. Two aspects encouraged the development of the sector, namely the fact that the price of their oil imports tripled during the oil crisis in 1973, and the global price of sugar declined in 1974. The programme took cognisance of the fact that Brazil has a comparative advantage for producing sugarcane (Weidenmier et al. 2008). In 1998 the Brazilian government removed ethanol subsidies, but it is still taxed at a lower rate at the pump (Weidenmier et al. 2008).

The South African cabinet published a South African Industrial Biofuel Strategy in 2007 in which they identified sugarcane and sugar beet as potential crops for first generation bioethanol production, and sunflower, canola and soya beans as potential crops for first generation biodiesel production. Concerns about food security led the strategy to exclude maize as a potential feedstock for bioethanol production, disgruntling many maize farmers who would have welcomed the additional market. The maize surplus that was produced in 2010 calls for a re-assessment of this prescription (Radebe 2010).

In 2009 the Western Cape Department of Agriculture, on behalf of the Task Team on Biofuels, compiled a report in which the suitability of the Province for the production of first generation biofuels was assessed. Of the selection of crops that the South African Industrial Biofuel Strategy identified as suitable for biofuel production in the country, only canola is cultivated in the Western Cape. However, canola was dismissed as an energy crop as the Western Cape is a net importer of it. To date biofuel production in South Africa remains limited.

Transition from first to second generation biofuels

As illustrated by the strict prescriptions of South Africa's Industrial Biofuel Strategy, first generation biofuel production is associated with concerns about food security, increases in food prices, and land-use changes. High production costs and disagreement about the net impact of biofuels on greenhouse gas emissions have provided added controversy to the development of the sector (Sims et al. 2009). Second generation biofuel technology mitigates some of these concerns. Where first generation biofuels are produced from food crops that are high in sugars, starch or vegetable oil,

the technology used by second generation biofuels allows lignocellulosic biomass such as non-food crops, crop residues, wood or forestry residues and even algae to be used for biofuel production (Carriquiry et al. 2011). In many cases it does not require land-use changes.

Second generation biofuels currently make up a mere 0.1% of global biofuel production, mainly through production by pilot plants (Sims et al. 2009). The technology is hampered by financial constraints such as high capital investments and high production costs. One mitigating factor is the reduced opportunity cost of feedstock since food crops do not have to be substituted, but transport costs to and from the biofuel plant and area specific characteristics such as water and land availability (when non-food crops are produced) still need to be accounted for. Production costs vary with plant complexity and the efficiency with which different types of biomass can be converted into fuel (Eisentraut 2010). On average the cost of cellulosic ethanol is two to three times higher than the energy equivalent quantity of petrol (Carriquiry et al. 2011), thus far making it unfeasible to be produced as a competitive source of energy. However, as the technology matures the cost is likely to fall.

Potential for second generation biofuel production in SA if the technology matures

Although second generation biofuels have to date not developed sufficiently to become competitive with conventional energy supply, there is merit in investigating potential production in South Africa if the situation is to change. The preliminary assessment below estimates the potential yield from second generation biofuels produced with lignocellulosic agricultural residues.

Second generation biofuel yield is a function of the residue-to-crop ratio, the amount of dry matter of the crop, and the percentage of lignin and carbohydrates in the crop. The total amount of biofuels produced will depend on the biomass yield per hectare, which is in turn a function of soil quality, topography, rainfall, and other biophysical characteristics.

Total agricultural residues from lignocellulosic crops grown in South Africa have the potential to produce 1 740 million litres of second generation biofuels given the present state of the technology. This would constitute more than fourfold the 400 million litres biofuel target as set out in the South African Industrial Biofuel Strategy. The key contributors are sugarcane bagasse and maize residues. In the Western Cape, straw from barley and wheat crops would allow for the production of 101.4 million litres of second generation biofuels.

While second generation biofuels may not compete directly with food crops, it does compete with scarce resources such as water and nutrients (Langeveld et al. 2010). An opportunity cost associated with the current use-values of crop residues such as nutrient cycling and fodder is implied. The Western Cape is reputed for its low soil carbon, suggesting that crop residues normally applied to land will come at a high opportunity cost. Due to additional steps in the conversion process, water requirements associated with the production of second generation biofuels are higher than that of first generation biofuels. An estimated four to eight litres of water per litre of biofuel is required during the biofuel production process (Hargrove 2007; Eisentraut 2010). Climate change is expected to reduce water availability in the Western Cape, potentially leading to further increases in real production costs (DEA 2010). While this may paint a bleak picture, it should be noted that the technology has not yet matured and that investment in

research and development in second generation biofuels will alter the available opportunities. Stellenbosch University hosts a Biofuels Research Chair that is doing valuable research in this regard. By increasing biofuel output per tonne of biomass, decreasing operational costs, or decreasing the demand for water during the production process, a more favourable outcome may be achieved. If alternative sources of water such as treated wastewater or desalinated seawater can be provided at a price lower than the marginal cost of water run-off, this could also assist in improving the competitiveness of second generation biofuels.

Food security in a perfectly competitive and open economy

Arable land in the Western Cape is limited, and if farmers can obtain a higher income from biofuel producers than from the market for food, neo-classical economic theory suggests that they will switch to producing energy crops. It also suggests that an optimal solution would occur if each country specialises in the production of the good for which it has a comparative advantage (in this case either food or energy crops). In a perfectly competitive and open global economy in which such specialisation occurs, food will be imported at a lower opportunity cost than at which it can be produced locally and biofuels will be exported, or vice versa. However, the global economy is neither perfectly competitive nor is trade entirely unrestricted. For a Province that is regarded as the bread basket of the nation, switching to energy crops rather than food production is a dangerous risk. The neoclassical economic argument thus has to make way for a political economy argument in which food price increases and its resulting impacts, especially on the poor, need to be guarded against.

To mitigate the threat to food security the argument is often made for energy crop production from marginal land. Besides the issue of how marginal land is defined, a second question arises as to whether energy crops will remain restricted to marginal land or how crop switching will be limited. Landowners select land-use activities according to whichever yields the highest return, and productive land will be directed towards energy crop production in areas where the latter can yield higher returns than food crops. Marginal land will remain as such unless energy crops with characteristics that allow them to be produced at a lower real cost on marginal land than on productive land (such as a low demand for water) are used. To add to the complexity, whenever alien crop species that exhibit such characteristics are considered it is important to first establish their potential impact on biodiversity and the ecosystem.

If the South African government wants to increase first generation biofuel production without risking food price increases and food security, an investigation about which areas in the country will be able to do so at the lowest opportunity is required. Again an argument for investment in the development of second generation biofuel technology can be made, as this technology has been shown to hold a lower risk to food price increases and food security.

A final lesson can be learnt from Brazil where their biofuel industry flourished as a result of a favourable economic environment and the fact that they could encourage the development of a sector for which they had a competitive advantage. In the development of a South African biofuel sector, policy makers would be wise to follow the same approach.

Table 1: Estimated capacity for second generation biofuel production from lignocellulosic agricultural crops in South Africa, 2007

Crop	Residue	Residue/ crop ratio	Crop dry matter (%)	Biofuel yield (litre/kg dry biomass)	Crop production (‘000 tonnes)	Biofuel yield (million litres)
Barley	Straw	1.2	88.7	0.31	159	23
Maize	Stover	1.0	86.2	0.29	7 949	993
Sorghum	Straw	1.3	88.6	0.27	240	33
Wheat	Straw	1.3	89.0	0.29	1 620	237
Sugarcane	Bagasse	0.6	89.1	0.28	16 637	454
Total						1 740

Calculated according to average world yields. Adapted from (Carriquiry et al. 2011; StatsSA 2007). Own calculations.



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Proefresultate te Langgewens en Tygerhoek Proefplase

Om die effek van grondbewerking en wisselbou op die persentasie residu te kwantifiseer is die "Line-transect" metode gebruik om die persentasie bedekking te bepaal (Lafren et al, 1981). Volgens die literatuur beskikbaar word 'n minimum bedekking van 30% vereis om die voordele van verminderde bewerking te verseker. Die inligting vervat in Tabele 1 en 2 toon duidelik die effek van grondbewerking (mate waartoe grond versteur is) en wisselbou op die persentasie bedekking direk na plant in jaar 5 (jaar 1, siklus 2) aan.

TABEL 1 Invloed van bewerking en wisselboustelsel op residuele bedekking (%) direk na plant van die 2011 gewas te Langgewens. Die eerste letter toon die gewas wat in 2011 geplant is, bv. WMcWm: koring geplant (W), dus was die vorige gewas medic (Mc).

Stelsel	Bewerking				Gemiddeld
	Zero	Geen	Minimum	Konvensioneel	
McWmW	64	51	53	49	54
WMcWm	36	28	18	6	22
WLWC	61	52	32	6	38
WCWL	72	43	25	6	36
WWW	74	65	42	9	47
LWCW	93	57	38	12	50
CWLW	87	41	33	8	42
Gemiddeld	69	48	34	13	41

TABEL 2 Invloed van bewerking en wisselboustelsel op residuele bedekking (%) direk na plant van die 2011 gewas te Tygerhoek. Die eerste letter toon die gewas wat in 2011 geplant is bv. WMcWm: koring geplant, dus was die vorige gewas medic (Mc).

Stelsel	Bewerking				Gemiddeld
	Zero	Geen	Minimum	Konvensioneel	
McWmW	62	64	59	56	60
WMcWm	55	33	21	12	30
WLWC	66	40	29	13	37
WCWL	58	33	27	10	32
WWW	90	54	41	18	51
LWCW	84	54	40	20	49
CWLW	58	45	40	23	41
Gemiddeld	67	46	36	21	43

Bewerking, wisselboustelsel en bedekking

Op beide lokaliteite het die zero bewerkings die hoogste persentasie bedekking tot gevolg gehad. Geen vermenging met die bogrond was waarneembaar nie. Omdat onkruidbestuur moeilik en soms oneffektief (veral in die koringfase) was, is die bedekking 'n kombinasie van gewas en onkruidresidue en kan dus nie sonder voorbehoud beter as die res beskou word nie.

Die nadelige uitwerking van die konvensionele bewerking op bedekking was duidelik waarneembaar op beide lokaliteite. Aangesien die bewerkingsbehandelings nie in die medicfase van die McWmW stelsel toegepas word nie, word relatief hoë bedekkings in hierdie fase ook in die konvensionele persele (49% en 56% vir Langgewens en Tygerhoek onderskeidelik) waargeneem.

Beide tabelle toon dat die geen bewerking, met uitsondering van die koring na medics (WMcWm) stelsel, dus goed vaar met 48% en 46% vir Langgewens en Tygerhoek onderskeidelik.

Die bydrae van medics tot die bedekking blyk laer te wees as die ander gewasse in die studie. Op beide Langgewens (22%) en Tygerhoek (30%) is die laagste gemiddelde bedekking op die koringpersele wat volg op medics (WMcWm) gemeet.

Die studie toon duidelike verskille in bedekking tussen behandelingskombinasies. Alhoewel daar gepoog moet word om bedekking te verhoog, moet besef word dat daar egter verskeie voor- en nadele verbonde is aan die aanwesigheid van 'n dik laag gewasreste. Bestuurspraktyke sal noodwendig aangepas moet word by die bedekking aanwesig.

Kontakbesonderhede

Vir meer besonderhede aangaande hierdie studie, kan Dr Johan Labuschagne, Senior navorser, Instituut vir Plantproduksie, by johani@elsenburg.com of 082 905 3952 gekontak word.

Verwysing

Lafren, J.M., Amemiya, M. & Hintz, E.A., 1981. Measuring crop residue cover. *Journal of Soil and Water Conservation*. Nov-Dec p. 341-343.



Foto 4: Groot hoeveelhede gewasresidues sigbaar direk na plant in die geen bewerkingstelsel.



Foto 5: Bedekking is laer in die minimum bewerkingstelsel indien vergelyk met die geen bewerkingstelsel op foto 4.



Foto 6: Bedekking is baie laag in die konvensionele stelsel waar drie aktiwiteite (tand, ploeg en plantproses) grondversteuring veroorsaak. Die kaal oppervlak stel hierdie grond bloot aan die impak van die vallende reëndruppel asook erodering van vrugbare bogrond.

EKSTENSIEWE BOERDERY: Navrae aan die veldnavorsingspan

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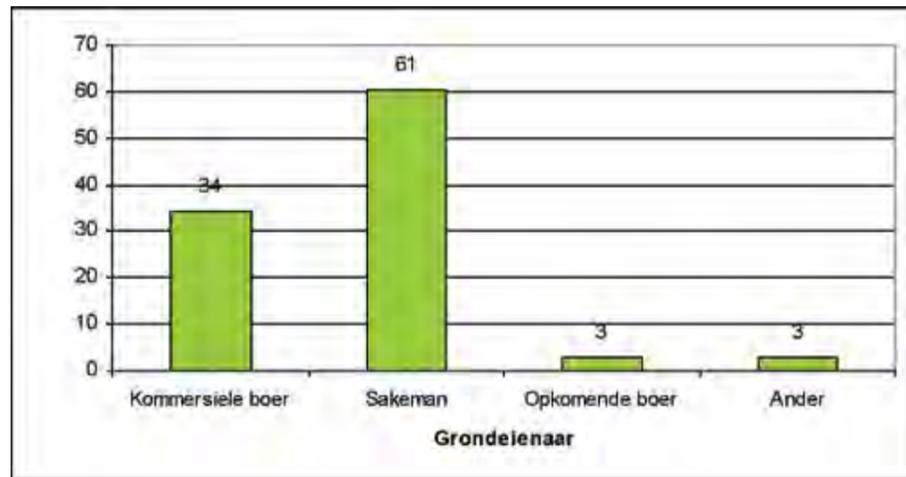


Ekstensiewe veeboerderyplase in die Wes-Kaap en veral in die Kaapse Wynland distrik word meer en meer deur sakemanne in Kaapstad gekoop om in 'n wildplase te omskep, hetsy vir private doeleindes of vir toerisme-ontwikkeling. So is gevind uit navrae wat die veldnavorsingspan van Wes-Kaapse Departement van Landbou die afgelope 5 jaar ontvang het. Hierdie inligting is nie versamel deur 'n navorsingsprojek nie, maar is 'n toevallige profiel, opgestel uit die groep van mense wat ons genader het vir advies.

'n Databasis is bygehou van plaasbesoeke wat oor die afgelope 5 jaar gedoen is, na aanleiding van wat die span opsigself en in samewerking met die Landbou-voorligtingskantore op Laingsburg en Beaufort-Wes ontvang het. 'n Totaal van 38 plase is besoek. Die eienaars van hierdie plase was hoofsaaklik sakemanne, gevolg deur kommersiële boere. Enkele navrae is ook van opkomende boere en privaatinstansies ontvang (Figuur 1).

Die navrae het oor 'n wye verskeidenheid onderwerpe gehandel en meeste van die grondeienaars het meer as een navraag gehad. Die meeste wou weet hoe kan hul veld verbeter. Dit sluit in die insaai van saad van inheemse spesies en hoe daar te werk gegaan moet word om dit te doen. Wat hierby aangesluit

het, was navrae oor die verbetering van outlande om weer smaaklike spesies (grasse en bossies en soms bome) te vestig om sodoende die weidingspotensiaal te verbeter, maar dit ook sover moontlik te restoreer na sy natuurlike staat (Figuur 3).



Figuur 1: Verskillende tipes grondeienaars van wie navrae ontvang is.

Voorligtingsdienste lewer uitgebreide dienste aan opkomende boere, vandaar die min navrae gerig aan navorsers vir hulp van hulle kant. Bogenoemde word ondersteun deur die feit dat 42% van die grondeienaars wat navraag gedoen het binne die munisipale grense van die Stad Kaapstad woonagtig is, terwyl 50% van die plase wat besoek is in die Kaapse Wynlanddistrik

geleë is, met slegs 26% van die eienaars wat daar woon (Figuur 2). Die meerderheid van die plase wat besoek was, is in die Ceres- (18%) en Worcesterdistrikte (16%) geleë. Die tipes boerdery waarvoor navraag gedoen is, was hoofsaaklik wild- (51%) en veeboerdery (38%).

Baie boere wou weet wat die toestand van hulle veld is en daarop het gevolg hoe hulle dit kan verbeter, maar baie het geweet hulle veld is in 'n swak toestand en wou net weet wat hulle daaromtrent kan doen. Hand-aan-hand hiermee het natuurlik aanbevelings oor veldbestuur gevolg. Dit was veral die nuwe wildboere wat leiding hieroor wou hê, alhoewel die navraag rondom vee ook veldbestuur ingesluit het. Twintig persent van die navrae het gehandel oor tipe wildspesies wat aangehou kan word en die getalle van elk (Figuur 3). Dit was duidelik dat hierdie voornemende boere nie die nodige kennis en agtergrond gehad het nie en daarom heelwat leiding nodig het. Die verskeidenheid spesies en getalle wat hulle ingedagte het, was gewoonlik meer as wat deur die weiding beskikbaar op die plaas gedra kan word, selfs onder optimale toestande. Optimale toestande is selde gevind, want meeste van die plase wat vir wildplase aangekoop is, was oor 'n lang tydperk in die verlede aan swak veldbestuurspraktyke blootgestel en in 'n relatiewe swak toestand. Die meeste plase is verkoop omdat die veeboer nie meer 'n goeie bestaan daar kon maak nie en 'n goeie prys vir sy grond kon kry. Grondaankope deur buitelanders en sakemanne, selfs van buite die provinsie, het ook die grondpryse tot so 'n mate die hoogte laat inskiet dat dit in sekere gebiede nie meer ekonomies lewensvatbaar is vir 'n veeboer om dit te koop en 'n bestaan daaruit te maak nie.

te vat in 'n besluitnemingsmodel wat bestaan uit 'n databasis en kundigheidstelsel vir adviseurs wat selfs die leek kan gebruik, deur 'n paar basiese vrae te vra en observasies te doen, om nog beter advies aan die boere te kan gee.

Deur hierdie kundigheid in so 'n stelsel vas te vang kan selfs 'n jong navorser/tegnikus goeie en meer betroubare advies aan boere gee.

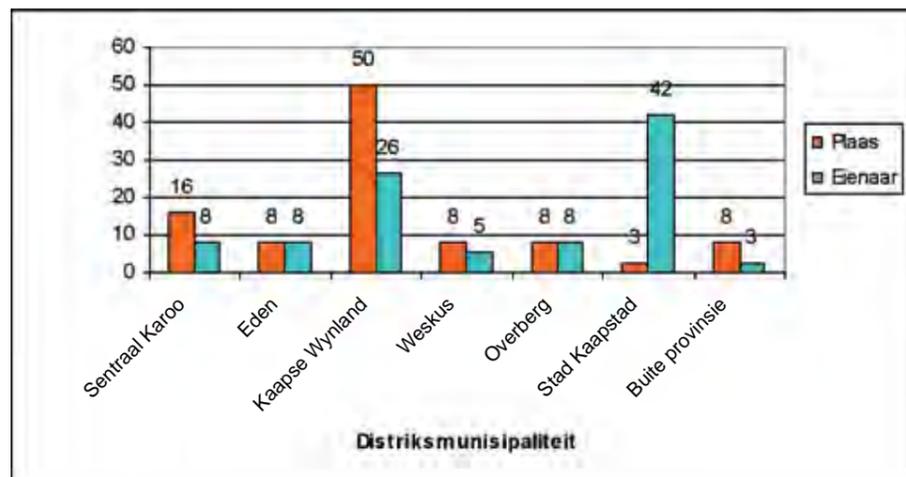
Die doel van die projek is tweeledig:

- Eerstens om 'n gebruikersvriendelike veldkundigheidstelsel vir beter bestuurspraktyke te ontwikkel wat op langtermyn data en inligting reeds ingesamel deur kundiges berus, en
- Tweedens om voort te gaan met tegnologie-oordrag aan boere en daardeur die stelsel te toets en te verbeter.

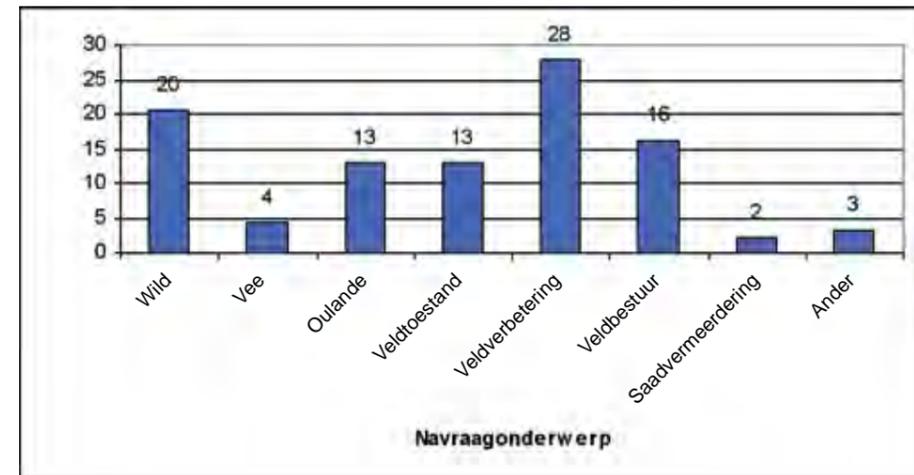
Vir meer inligting oor hierdie projek, of as u enige veldverwante navrae het en van ons kundigheid wil gebruik maak kan u ons gerus kontak via u voorligtingskantoor, of direk vir Nelmarie Saayman van die Instituut vir Plantproduksie, Departement Landbou: Wes-Kaap te Elsenburg by **021 808 5330** of **nelmaries@elsenburg.com**. Ons lewer hierdie diens gratis en kan u of telefonies help, of indien nodig, u op 'n geleë tyd op u plaas besoek.

Uit die navrae is dit duidelik daar 'n groot behoefte aan advies is en uit die terugvoering wat van die boere gekry word en nuwe vrae van dieselfde boere is dit duidelik dat dit 'n nodige en nuttige diens is wat gelewer word.

As uitvloeisel van hierdie navrae is besluit om die kundigheid wat oor die jare opgebou is deur die span en hul medewerkers saam



Figuur 2: Die distriksmunisipaliteite waarbinne die plase geleë is en waar die eienaars woonagtig is.



Figuur 3: Die breë onderwerpe waarvoor navrae ontvang is.

IS IT TRUE THAT ALL COMMERCIAL FARMERS ARE GETTING RICHER?

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The long-awaited Survey of Commercial Agriculture was eventually released by Statistics South Africa on 23 June 2011; an event of great excitement for all and sundry hungry for information on the Agricultural Sector. Especially for us, as agricultural economists, the release of this data created the opportunity to analyse new data, make calculations and engage in our favourite pastime; drawing tables and graphs.

As StasSA received a 75,1% response rate (89,2% of commercial agricultural turnover) on the 15 002 questionnaires sent out (StasSA, 2011), commercial farmers must not only be congratulated with their positive attitude, but these surveys can be used with confidence in comparison with older census data.

Agriculture is not a dying Sector,...

As the allegation is often made that Agriculture is a “dying” Sector, it is especially relevant to track the progress in farming income over the past two decades (see Table 1). It is evident that, although the number of commercial farms in South Africa declined from close to 58 000 in 1993 to just below 40 000 in 2007, the nominal value of the gross income received from farming increased from R19,6 billion in 1993 to R119,4 billion in 2009. Over the same period the average nominal income per farm increased from R0,34 million to R2,99 million.

Table 1: Key elements of South African Commercial Agriculture.

VARIABLE	UNIT	YEAR				
		1993	2002	2007	2008	2009
Gross farming income (GFI)	R Mil	R19 620	R53 329	R79 213	R95 224	R119 355
Farming units 1	Number	57 980	45 818	39 982	39 982	39 982
Average GFI	R Mil	R0,34	R1,16	R1,98	R2,38	R2,99
GFI (2010 values)	R Mil	R57 423	R82 805	R98 857	R106 575	R124 424
Average GFI (2010 values)	R Mil	R0,99	R1,81	R2,47	R2,67	R3,11

Sources: Calculated from DAFF (2011), StatsSA (2011), StatsSA (2007), StasSA (2002)

Note: 1 As the 2008 – 2009 Survey did not count the number of farms, the data from the 2007 Census is extrapolated to these two years.

This growth is in nominal terms and the question should be asked whether it will be maintained if the effect of inflation is included in the calculations. The information in Table 1 also show us that, if we deflate the various results to reflect 2010 values, the total value of income received by farmers almost doubled from R57,4 billion in 1993 to R124,4 billion in 2009. More significantly, as the number of farms declined over the intervening years, the average deflated income of farms more than tripled from R0,99 million to R3,11 million over the same period.

...but neither can commercial farmers be accused of usury profits.

As averages are, on average, always a dangerous foundation for deductions, it is worth the while to disaggregate this data. The results of the 2002 Agricultural Census made provision for 6 Categories of farms (see Table 2) ranging from those with an income of less than R300 000 (the VAT cut-off at that stage) to those receiving an income of more than R10 million. In 2002 approximately 51,1% of farms were in the lowest category and they received 13,9% of the gross farm income. The 1,5% of farms with an income of more than R10 million per year were responsible for more than 33,5% of income received by the Agricultural Sector. By deflating the 2002 Categories, the category boundaries can be translated into nominal terms for the years 2007 to 2010.

Table 2: Translating the 2002 commercial farming categories into nominal terms.

NR	2002 CATEGORIES	% DISTRIBUTION		CATEGORY UPPER BOUNDARY				
		NUMBER	GFI	2002	2007	2008	2009	2010
1	Less than R299 999	51,1%	13,9%	0,30	0,37	0,42	0,45	0,47
2	R300 000 - R999 999	25,8%	10,0%	1,00	1,24	1,39	1,49	1,55
3	R1 000 000 - R1 999 999	11,4%	13,8%	2,00	2,49	2,77	2,98	3,11
4	R2 000 000 - R3 999 999	6,6%	9,5%	4,00	4,98	5,55	5,96	6,21
5	R4 000 000 - R9 999 999	3,6%	19,4%	10,00	12,44	13,87	14,89	15,53
6	R10 000 000 and more	1,5%	33,5%	>10,00	>12,44	>13,87	>14,89	>15,53

Sources: Calculated from DAFF (2011) StatsSA (2011), StatsSA (2007), StasSA (2002)

It is unfortunate that data placing commercial farms in comparable categories was neither released for the 2007 Census nor for the 2008 – 2009 Survey. However if the (very important but credible) assumption is made that the structure of the distribution between

the various farming categories did not fundamentally change over the intervening seven years, the subsequent data can be manipulated to simulate the realities in 2007 to 2009. The information in Table 3 represents the subsequent distribution of farm income in 2009 at deflated 2010 values.

Table 3: Income distribution in the South African Commercial Agriculture in 2009 (2010 values).

CATEGORY	FARMS		GROSS FARM INCOME	
	Numbers	%	TOTAL (R Mill)	Average (R Mill)
1	20 444	51,1%	R17 275	R0,85
2	10 301	25,8%	R12 449	R1,21
3	4 550	11,4%	R17 152	R3,77
4	2 654	6,6%	R11 799	R4,45
5	1 446	3,6%	R24 102	R16,67
6	587	1,5%	R41 648	R70,92
TOTAL	39 982	100%	R124 424	R3,11

Sources: Calculated from DAFF (2011) StatsSA (2011), StatsSA (2007), StasSA (2002)

Of importance in this data is the fact that more than 51% of farms in South Africa had an average farming income of approximately 850 000 (in 2010 values). It should be remembered that this is gross income and that all expenditures still needs to be deducted. At the other extreme the average income of 587 farms (1,5% of the total number of farms) were just over R70 million per year.

On the balance of facts, farming should be considered the embodiment of successful small businesses.

To return to the question posed at the beginning of this paper. Agriculture is not a dying Sector; to the contrary, it is healthy and growing. Nevertheless, in 2010 values the average income of more than half of all commercial farms are approximately R0,85 million. As all expenditures still has to be deducted, this can barely be called profiteering wages.

The picture that emerges is that the majority of South African Commercial Farms are relatively small but successful

businesses. As it is proving to be the quintessence of small business, farming should perhaps attract more attention from those promulgating SMMEs.

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DEPARTMENTAL EXTENSION AND ADVISORY SYMPOSIUM EMBRACES COLLABORATION

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The second annual Extension- and Advisory conference, held at Langebaan on the 27th and 28th of July 2011, were well attended by extension officers and advisory staff through out the Department and from all the corners in the Western Cape.

The theme of this year's conference was "Agricultural prosperity through integrated advisory services" and the show of integrated service delivery to our clients ran through the posters, presentations and awards like a golden thread.

A showcase of collaborative service delivery projects was presented and the focus was not only on the success stories, but also on the much needed lessons learnt and failures not to be repeated again. Collaboration was vigorously put under the microscope from all angles and delegates were encouraged to engage in dialogue with the presenters.

The conference also presented the ideal opportunity for networking and colleagues, who does not see each other on a daily basis due to distance and time-constraints could catch up and get to know each other better.

The end-goal of the conference was to improve synergy and encourage the break-down of silo's between programmes. It was established that open communication and an improved understanding amongst field officers on the various challenges experienced by individual programmes were key to a structured integrated and collaborative approach.

Minister Gerrit van Rensburg, Western Cape MEC for Agriculture and Rural Development opened the conference reminding extension- and advisory officials that their underlying objective as servant of agriculture is to promote efficient production of food for all to ensure food security. "You are the eyes and ears on the ground, the hands in the soil – our clients trust and rely on you. We need out of the box ideas to solve certain issues and that is why we need to share our experiences with each other." Minister van Rensburg asked whether extension- and advisory officials will follow their own advice and urged them not to be "coaching from the side of the pool

if they cannot swim themselves, but to embrace ambitious targets and jointly make a success of farming in the Western Cape."

Ms Joyene Isaacs, Head of the Western Cape Department of Agriculture stressed that Extension and Advisory officials must understand their roles and responsibilities in servicing clients and strategies must be put into practice. Ms Isaacs pointed out that there are six key elements in delivering a successful extension- and advisory service:

- Research
- Rural Development
- Revitalisation of extension
- Increase agricultural production
- Market access
- Monitoring and evaluation

The inspiring speeches were followed by presentations ranging from experiences from overseas trips to case studies showing what works and what doesn't in terms of collaboration between programmes and other Departments.

The highlight of day one was definitely the gala dinner where prestigious awards were bestowed upon a range of worthy winners. The awards serve to achieve the objectives of the Norms and Standards for Extension- and Advisory Services, fulfil the ideals of the CASP pillar on Technical and Advisory Services and to fulfil the recommendations of the Extension recovery Plan (ERP) on the promotion of image and professionalism.

By encouraging staff to participate excellent performance and service delivery are stimulated, professionalism and the image of extension and advisory services are promoted and the quality of work by departmental employees in the field of extension and advisory services are highlighted.



Fitr: Dr Gideon Brückner, Dr Pieter van Rooyen, Joyene Isaacs (Head of Department) and Johan Blomerus.

CATEGORY	AWARD	WINNER/S
1	Western Cape Agriculture Honorary Awards (Staff who made a significant contribution to agricultural development in the Western Cape)	Dr Gideon Bruckner
		Mr Johan Blomerus
		Dr Piet van Rooyen
		Mr Kobus Nel
		Mr Bennie Visser
2	Top Extension Suite-on-Line user (Manstrat)	Ms. Malebogo Phethlu: Senior Training Advisor: Eden & Central Karoo districts
3	Upgrading of qualifications through the Extension Revitalisation Programme (ERP)	Aubrey Magolela: (Overberg District): Post Graduate Diploma in Land and Agrarian Studies (UWC)
		LeFras Nortje: (Eden District): B. TECH (Extension: CPUT)
		Manie Grobler: (Eden District): M. TECH (Animal Production: NMMU at Saasveld Campus)
		Marius du Randt: (West Coast: Vredendal Office): MSc (Agronomy: US)
4	Top performers: departmental extension & advisory services	TOP PERFORMER: SUPPORT SERVICES (ADMINISTRATION)
		Ms. Alletta Cronje (FSD Eden District: George office)
		TOP PERFORMER ADVISOR
		Mr Wilton September (Cape Winelands District: Stellenbosch Office)
		TOP PERFORMER: SPECIALIST/ SCIENTIST
		Dr. Phillip Botha (Eden District: Technology Research & Development Services)
		GROUP AWARD: CENTRAL KAROO & EDEN FOR THE HOSTING OF A VERY SUCCESSFUL YOUNG EWE COMPETITION 2011
		Ian Terblanche (FSD: Eden)
		Jorita Van Der Merwe (FSD: Eden)
		Dr Jaco Pienaar (Vets: Central Karoo)
Elouise Hatting (Vets: Central Karoo)		
Anton Barnard (Vets: Central Karoo)		
Lefras NORTJE (FSD: EDEN)		
Frederick Mpona (FSD: Central Karoo)		
Vianca Erasmus (FSD: Central Karoo)		
Jan Johannes (FSD: Central Karoo)		
Faan Matthee (FSD: Eden)		
Manie Grobler- Project Leader (FSD: Eden District: George Office)		

The conference was concluded on day 2 when various staff delivered interesting case studies and posters, which highlighted successes and lessons learnt.

The conference was regarded in a very positive light by all and some very good suggestions and ideas have already been submitted by attendees for the next event.

MAINSTREAMING SUSTAINABILITY & OPTIMISING RESOURCE-USE EFFICIENCY

Aziel Gangerdine
Department of
Environmental Affairs and
Development Planning



Sustainability as a concept is not isolated, but is vulnerable to a wide range of influences. It has implications for the way all citizens conserve resources, the way business is executed, the way industry operates, and especially how the Western Cape is governed.

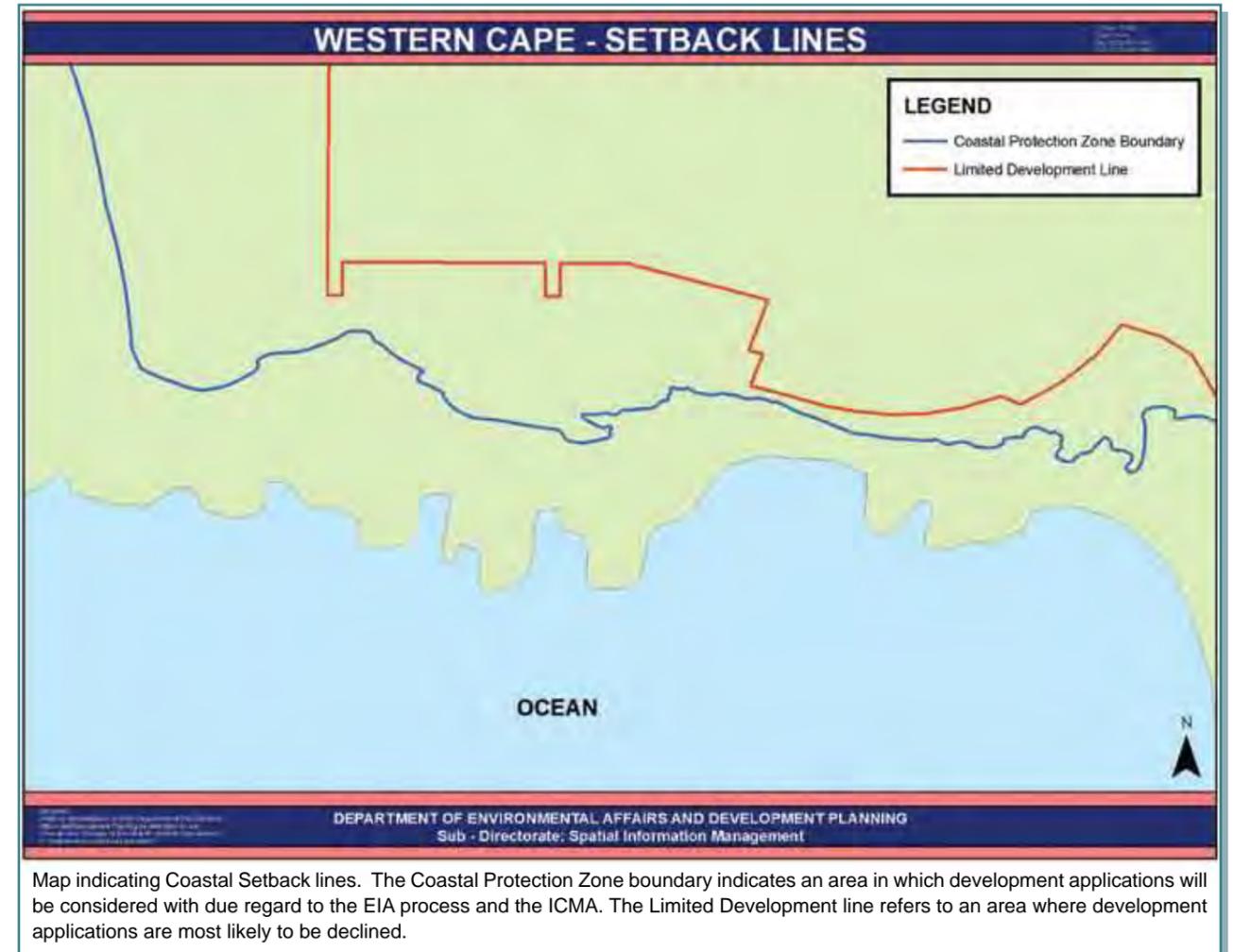
Poor management of our resources will not only mean a shortage of water and energy, but will manifest through poor land management practices. The health of our communities, the state of the provincial economy and livelihoods will be compromised if the environment is not sustainably managed.

The Department of Environmental Affairs and Development Planning (DEA&DP) is the provincial champion leading Provincial Strategic Objective 7 (PSO7), the plan of action being implemented with the aim to address the environmental challenges faced by the Province. The action plan not only impacts on service delivery, but also integrates the values of sustainability and resource efficiency into the activities of other provincial departments.

This essentially means that, the Department will be working towards realising service delivery change under the theme of "Mainstreaming Sustainability and Optimising Resource-

use Efficiency". This collaborative effort, led by DEA&DP also comprises the Department of Agriculture, the Department of Transport and Public Works, and the public entity, CapeNature. This approach outlines the importance of co-operative governance, and paves a new path as to why it is important for departments and different spheres of government to work together to address the environmental concerns of the Western Cape.

In due consideration of the various environmental challenges the Department, through the implementation of the Provincial Strategic Objective 7, identified six key policy priorities that would outline, to the officials of the Department, how best to address the identified environmental concerns. *Climate Change, *Water Management, *the Built Environment, *Pollution and Waste Management, and *Agriculture Land-use Management encapsulated the primary environmental challenges of the Province. The Department has already been actively implementing key projects that would ensure that concerns associated with the issue of climate change, for example, are addressed in areas such as informed land-use planning. The Coastal Setback Lines project, that forms part of the key policy priority of the Built Environment, will advance the manner in which decisions are concluded in terms of the location of proposed developments.



Focusing on Key Projects

Adapting to the effects of climate change through sustainable planning

The Integrated Coastal Management Act (ICMA), which came into effect in 2009, has as one of its core objectives, the provision for the establishment of coastal setback lines in order to demarcate areas within which developments will be prohibited or controlled. To this end, the Department, in collaboration with various external stakeholders, co-ordinated a project to develop a consistent methodology to define and adapt such setback lines. This proved to be a major milestone for the Department and the Western Cape, as the Province became the first in South Africa to implement the ICMA since it was enacted in 2009.

The coastal setback lines project being implemented by the Department can be considered as a catalyst to inform decision making with due regard on how best to adapt to the effects of climate change. Predictions indicate that, due to the increased warming of the earth's surface, glacial areas have started to melt resulting in evident sea level rise. In as much as these escalations are considered by some to be small and insignificant, it is also very clear that the long term impact on infrastructure along the coast, for example, will be prone to the consequences therefrom.

A clean environment: is confidently breathing in clean air

Inefficient technologies, inappropriate management of waste, poor

effluent quality from industry and wastewater treatment works, and the increase in the number of emergency incidents all impact on air, land and water resources in the Western Cape. Numerous air quality management challenges have been identified by the Department of Environmental Affairs and Development Planning as contributing factors that impact on the quality of air that we breathe.

The major contributors to air pollution are emissions from motor vehicles, particularly diesel vehicles, ensued by industrial activities and residential wood burning. Other contributing factors to poor air quality include smoke and soot from controlled and uncontrolled fires, seasonal agricultural burning and crop spraying and refuse burning. Industrial activities such as brick manufacturing and timber processing increase the particulate concentrations in the air as opposed to fish-meal processing resulting in offensive odours.

The Department of Environmental Affairs and Development Planning launched the Air Quality Management Plan (AQMP) in March 2010 to, through cooperative governance and oversight work, hand in hand with other spheres of government, industry, business, agriculture, non-governmental organisations, and civil society, to ensure clean and healthy air for all in the Western Cape. The AQMP was developed by the Department to comply with the National Environmental Management: Air Quality Act (NEM: AQA), and more specifically, to provide guidance on Air Quality Management in the Western Cape.





Ambient air quality monitoring station located at an identified area source.

A legislative context to advocate for and promote the use of renewable energy

The Western Cape is very reliant on fossil fuels for its energy needs, which leaves a negative footprint on the environment. This served as one of the primary reasons for the Province to consider a more sustainable path of energy production and use. In addition, it is estimated that 85% of the urban population live in electrified households. In essence, it has become clear that actions need to be geared towards ensuring affordable energy use for all and in so doing minimise the effects of generating energy upon human health, as a result of carbon emissions generated from the burning of fossil fuels.

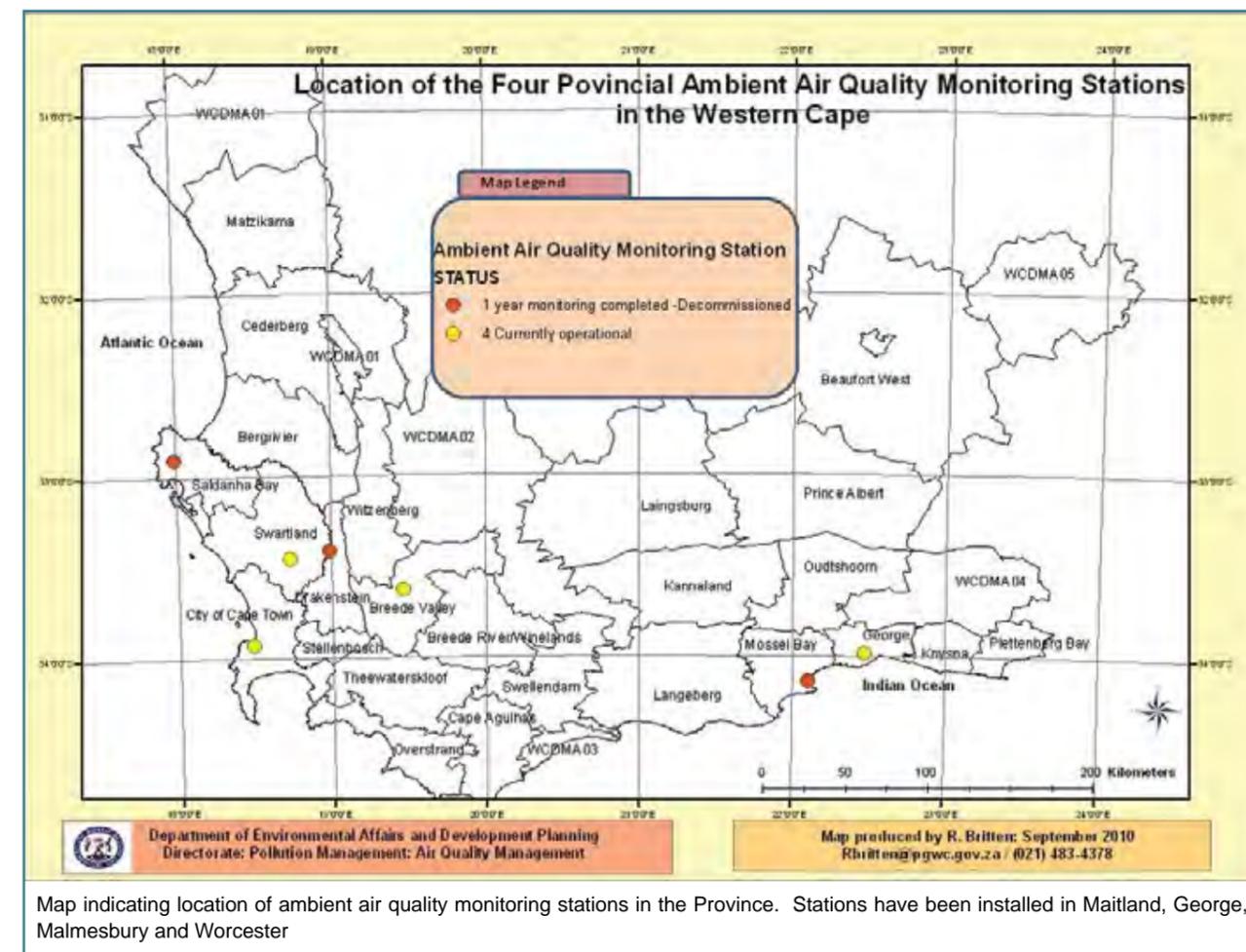
In 2010, the Department completed the formulation of the Western Cape Sustainable Energy Strategy. The aim of the strategy was to pave the way for renewable energy in the Province and to ensure an enabling legislative environment that would advocate for and promote the use of renewable energy without compromising economic growth. Succeeding the formulation of the Western Cape Sustainable Energy Strategy, the Department produced a draft Energy Bill that will address the manner in which households use and have access to energy and with the aim of ultimately eradicating energy poverty in the Province.

This will be achieved by, for example, providing and facilitating solar water geysers instead of households utilising conventional geysers; reducing the number of households using fires to cook or for warmth - by providing alternatives;

and by providing electrification where necessary. There are a number of ways to reduce 'energy poverty' but the underlying principle is to provide safe and more efficient use of energy. It must be understood that in order to promote the principles of adaptation and mitigation to climate change, a legislative context that stimulates preparedness of all stakeholders is essential. This is what can be achieved. However, the success of these frameworks require the co-operation of all stakeholders such as municipalities and industry.



Solar water heaters installed by the Department in Darling during 2010.



Map indicating location of ambient air quality monitoring stations in the Province. Stations have been installed in Maitland, George, Malmesbury and Worcester

Advancing infrastructure development with due regard to preserving our biodiversity

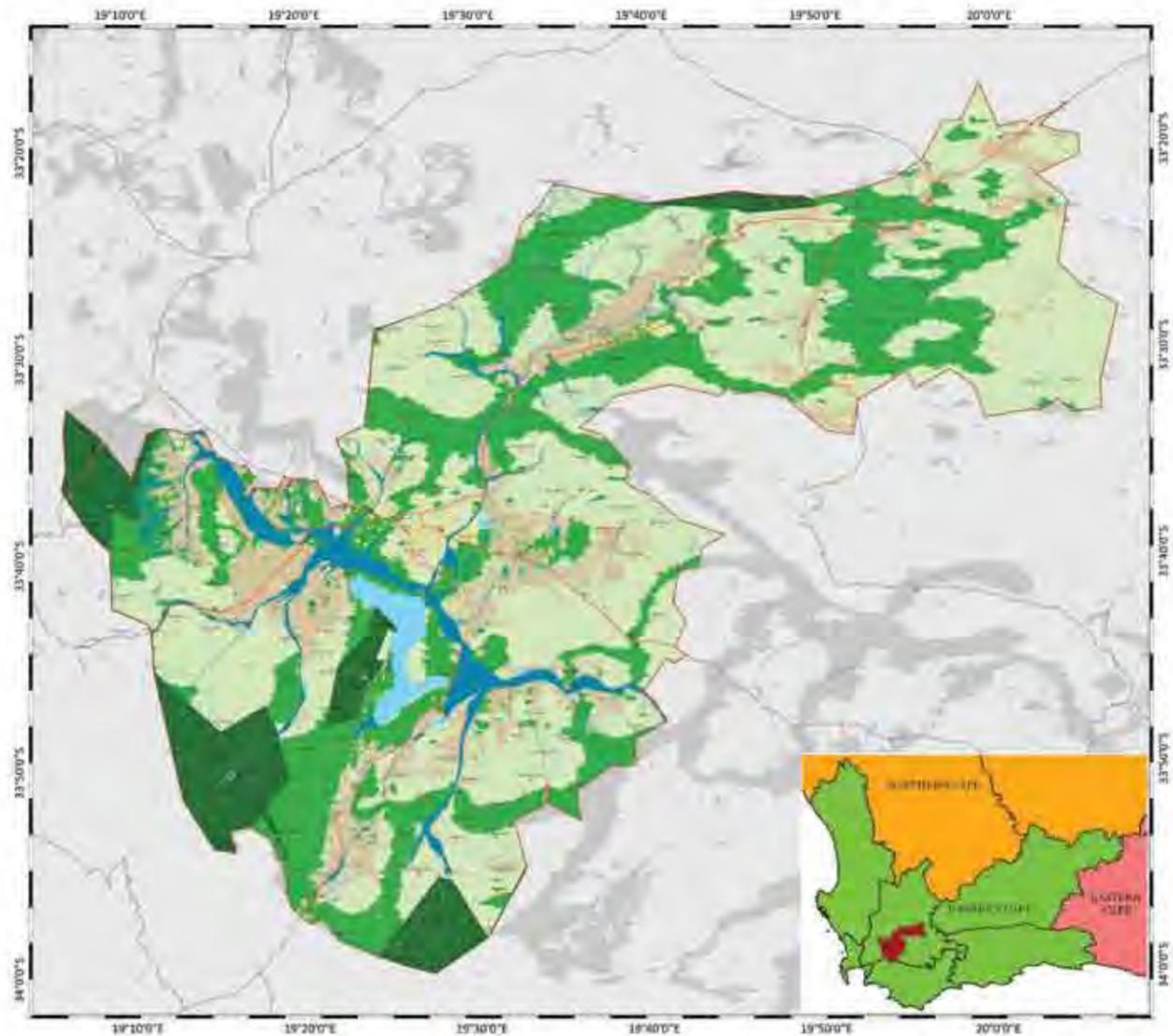
The Department, together with key stakeholders, including, among others, CapeNature and the South African National Biodiversity Institute (SANBI) launched a world first during 2010: Biodiversity Sector Plans. The plans are a new generation of planning tools that provide planners, environmental managers and land users with a wealth of biodiversity information. In addition, the plans promote the integrated use and management of natural resources by highlighting priority biodiversity areas (called Critical Biodiversity Areas) where loss of habitat should be avoided. Areas where ecological degradation should be prevented, referred to as Ecological Support Areas, are also indicated on these maps. This breakthrough means that planners are able to make more informed decisions about land-use and that developments are ecologically sustainable.

Through our daily socio-economic activities we exacerbate the degree of environmental ruin and ultimately compromise our very constitutional right to a clean and healthy natural environment. In as much as government and more specifically the Department of Environmental Affairs and Development Planning has a responsibility to regulate the "interdependent relationship" between human activities and the need to preserve the environment for future generations, there is a need for all citizens to accept their individual responsibility to take care of the environment.

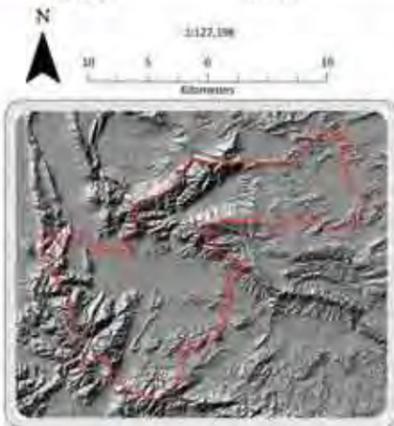
The Provincial Strategic Objective 7 is a plan of action to address the primary environmental concerns for the Western Cape; however this plan has not been prepared in isolation. It clearly outlines the need for co-operative governance, progressive stakeholder relations and the need for advanced informed decision making that will ensure a continued sustainable environment.

MUNISIPALITEIT
BREED VALLEY
MUNICIPALITY

CRITICAL
BIODIVERSITY
AREAS MAP



- Legend**
- Place Names
 - Roads
 - Municipality Boundary
 - Protected Areas
 - Critical Biodiversity Area - Terrestrial
 - Critical Biodiversity Area - Aquatic and Buffers
 - Critical Ecological Support Areas and Buffers
 - Other Ecological Support Areas and Buffers
 - Other Natural Areas
 - No Natural Remaining
 - Urban Areas



This map was produced by the Fine-Scale Biodiversity Planning Project, as part of Component 5.1 of Cape Action for People and the Environment (C.A.P.E.)

For more information contact: Scientific Services, CapeNature, Tel 021 866 8000.
For GIS Data or Maps contact: Biodiversity GIS (BGIS) at the South African National Biodiversity Institute, Tel 021 799 8738 or on the internet at <http://bgis.santia.org/>



An example of a Biodiversity Sector Plan prepared for the Breede Valley Municipality.

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