Session 6:
Sustainable Production

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Planet Friendly Citrus: Reconnecting Our Food Systems to Our Ecosystems

Inge Kotze
Senior Manager: Sustainable Agriculture
WWF-SA

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Presentation Overview

1. The current context: why is agriculture central to environmental sustainability?
   1.1 Agriculture – global driver of change
   1.2 The South African natural resource context
2. Managing environmental risks in citrus production
3. Increase scale and pace of action – opportunity for collective action

1.1 Agriculture as the Largest Global Driver of Change on Our Planet

- More than a 1/3rd of the globe under agricultural production (55% of all available, habitable land surface)
- The footprint of food leading driver of land transformation, land degradation and biodiversity loss
- Largest user of freshwater resources (2/3rds of water used)
- 25-30% contribution to GHG (land conversion, fuel, energy, electricity, agrochemicals and livestock)
- ½ of all topsoil lost in last 150 years

Future demand within constrained natural resource base:

Challenge of 21st Century – feed 9 billion by 2050, would require 70% more production current food footprint = better current production & productivity, resource use optimisation, shifting consumption patterns, addressing food waste

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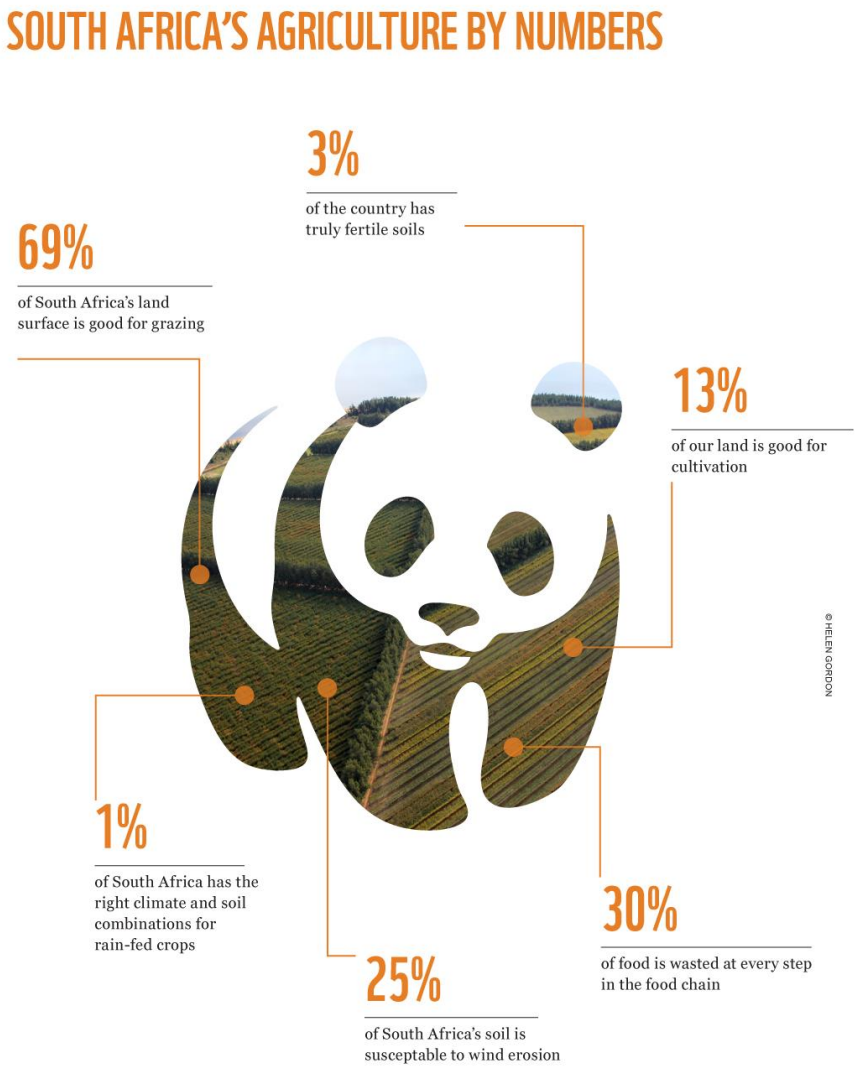
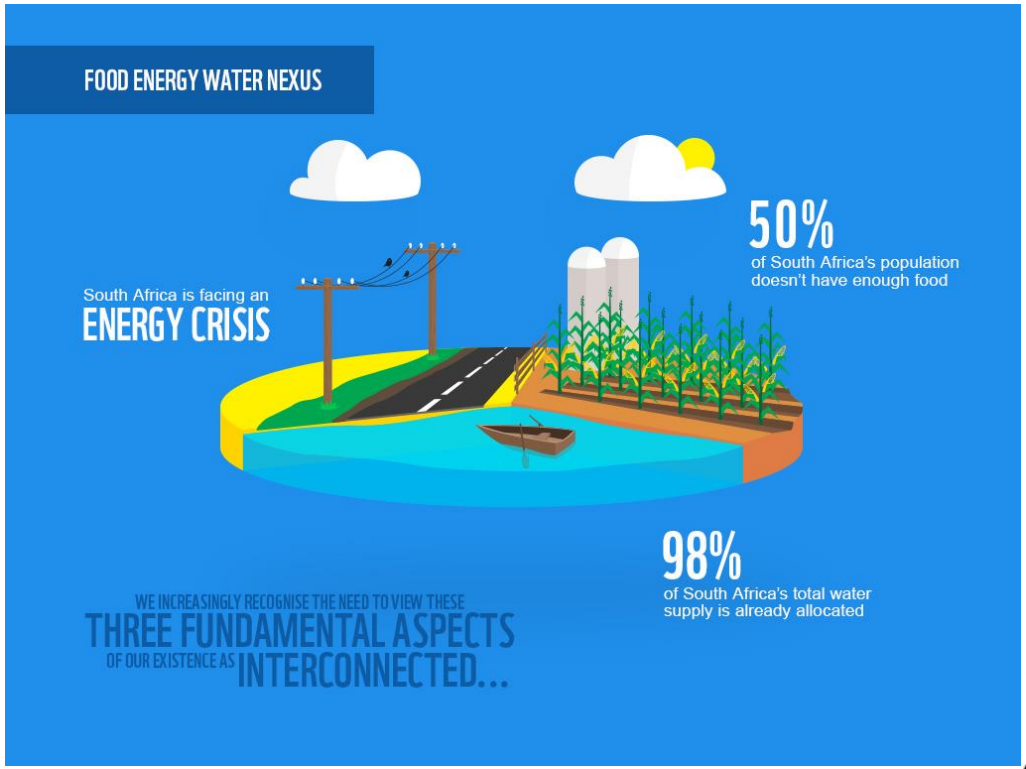
1.2 South African Agriculture - The Natural Resource Base Context





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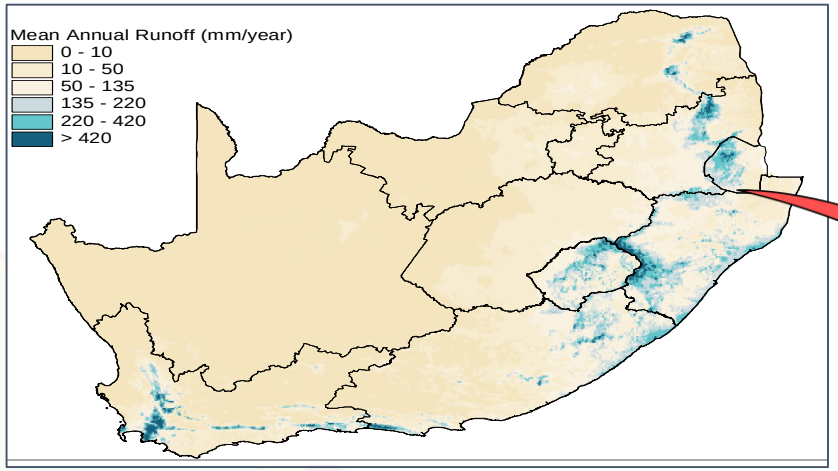
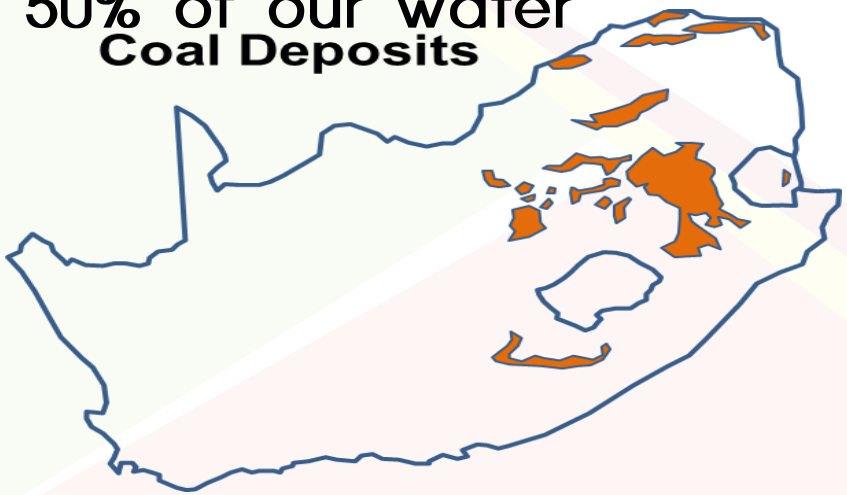
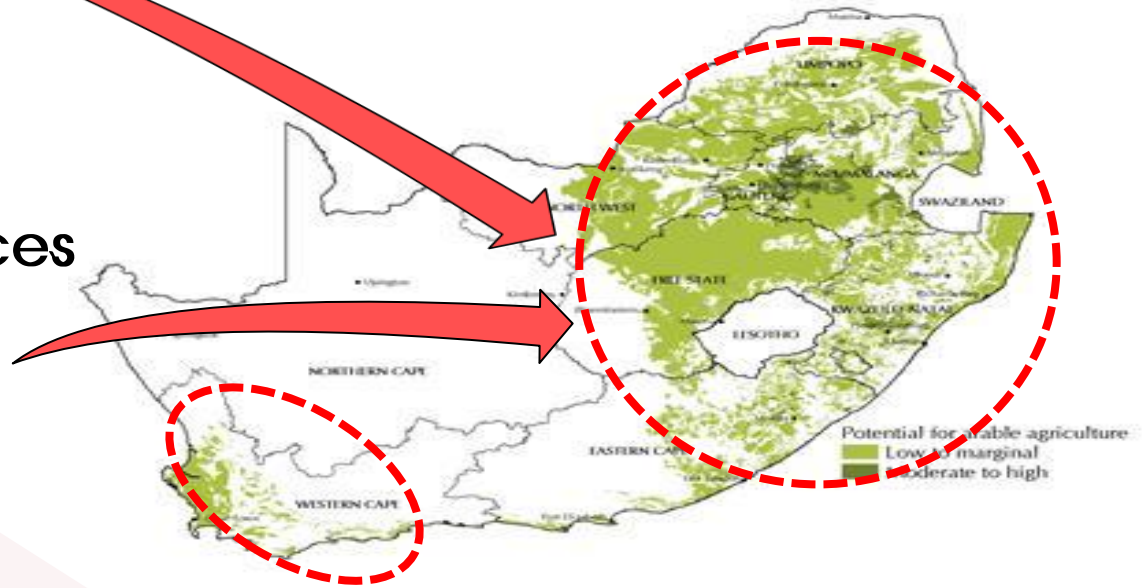


The South African spatial land use and resource trade -offs

8% of land surface produces
50% of our water





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2. Key Environmental Pressures / Risks in South African Citrus Production

- Changing climate: time of great uncertainty & unpredictability: seasonality, temperatures, extreme weather (droughts, floods, hail, wind), soil conservation, health, fertility, pest & disease.
- Increasing resource insecurity: increasing physical and economic scarcity – energy, water and land.
- Regulatory Risk: policy uncertainty re land, water and carbon…reconciliation and reallocations emphasizing need to monitor, verify use and due diligence in efficient use.
- Water quality (pollution) and soil health.
- Addressing waste (solid, waste water, and food waste).
- Increasing risk of and impact from wildfire (management of surrounding natural ecosystems): control of alien invasive plant species.

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2. Key Environmental Pressures / Risks in South African Citrus Production (cont)

- Protecting freshwater resource base: esp. wetlands, floodplains and river banks (riparian areas).
- Role in protecting pollinators.

2. The Business Prerequisite for Sustainable Production

Agricultural sector is at forefront of physical and economic scarcity of energy, water, land & increasing resource insecurity.

- **Managing increasing risks (access & cost) and rising input costs:** water, energy and soil/ land (agro-chemicals, pesticides, herbicides, diesel).
- **Regulatory and governance risk:** establishing baselines and progress tracking, verification/ due diligence.
- **Maintaining market access, driving non-duplication and harmonisation of requirements: but on our terms** – relevant to SA conditions and risk profile: improving traceability and visibility of efforts.
- **Buffering against changing climate:** fire, water risks & impacts, soil protection, protection extreme events: flooding/ droughts, wind etc.

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3. Opportunities for Individual and Collective Action

Changing climate – existing resource constraints and climate change simply exacerbating the **need for an increased rate, pace and scale** of reduced impact.

<u>Numerous excellent examples of good practices at farm and industry level:</u>

- **Confronting climate change carbon calculator** – tracking emission baselines and supporting resource efficiency and emission reduction;
- **Water use efficiency** – technology using optimal irrigation (including Fruitlook water efficiency initiative);
- **IPM** and **biological control**;
- **Soil protection, composting** (SRCC example);
- **Value-chain or catchment collaborations** such as WWF water risk filter and Alliance for Water Stewardship initiatives.

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3. Opportunities for Collective Action

One platform for evaluating your own integrated sustainability:
balancing needs and resourcing of **social, ethical and environmental risks and opportunities**.

SIZA Platform - Sustainability Initiative of South Africa

2017: new additional VOLUNTARY environmental performance assessment & tracking tool

Vision
Enabling South African Agriculture to be a global leader. Ensuring sustainable, ethical trade and environmental stewardship.

Mission
SIZA, the Sustainability Initiative of South Africa, provides a **platform for agricultural stakeholders** to **ensure ethical and environmentally sustainable trade**. This platform monitors care for the environment and compliance with labour legislation.

Our aim is to encourage continuous improvement in practices over time in excess of the minim legal requirements. We engage directly with our stakeholders throughout the value chain in orc identify needs and issues. Interventions and support tools are created by measuring member compliance over time.

Overview of the SIZA Environmental Performance Tool

Purpose: One stop shop of legal compliance requirements and better production guidelines, step wise tracking of improvement.

Approach: Proactive, voluntary tool

- Self assessment approach, and
- Ability to prioritise your own risk (local, regional and commodity context).

Benefits:

- Proactive response to market requirements – supporting harmonisation and convergence of existing and future requirements from market;
- Benchmarked against GlobalG.A.P, Leaf, Farming for Future, Sedex visibility…
- Identify key issues/ risks in your area/ farm and link to network of training and capacity building support to address these issues.

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An Introduction to the Environmental Performance Assessment Tool

Self Assessment Questionnaire: 20 key questions

- Evaluating your own **legal compliance, prioritised areas of risks** and possible **management responses**.
- Farm management tool and practical guidelines to implement & track step wise change and improvements.

Knowledge management and sharing platform:

- Platform provides an umbrella home for knowledge sharing and supporting tools to address key risks: Confronting Climate Change carbon calculator, WWF water risk tool, Alliance for Water Stewardship, Soil Conservation committees etc.
- Engage according to you own needs, level of assistance, at your own pace.

Overview of the SIZA Environmental Performance Assessment Tool

Excel based tool that allows you to:

1. Self-assessment
2. Draw report on the results / track dashboard of results
3. Create a step wise improvement plan

SAQ answered by 2 step response:

- To what degree is criterion being fulfilled or achieved?
- To what degree is the fulfilment of the criteria due to specific design or purposeful management process?

Principle		Criteria			Self Assessment	
Ref	A general condition necessary for the achievement of the Goal. A fundamental truth or law that provides the basis of reasoning and action. **Answers:** In order to achieve the goal, what, at a minimum, MUST be fulfilled by the system?	#	Focus Area	Sub-principles that add meaning and detail to the higher-level principle. The detailed outcomes one would expect to find in the system when the principle is being respected. **Answers:** What specific features of the system would we expect to be evident where the higher-level principle is fulfilled?	To what degree is the criteria being fulfilled or achieved? 3 = Fully 2 = Partially 1 = Not at all or Don't know	To what degree is the achievement of the criteria part of a specifically directed and purposeful management process? 3 = Fully 2 = Partially 1 = Not at all or Don't know
1a. Minimize	The risks and incidents of negative environmental impacts associated with farming activities are minimized.	1a.1	Water	The risk to water resources related to the storage and use of agro-chemicals, fertilizers and fuel is minimized.	3	3
		1a.2	Soil	The loss of soil through erosion is minimized.	2	2
		1a.3	Soil	Soil compaction is minimized	2	3
		1a.4	Soil	The risk of salinization and/or waterlogging of irrigated lands is minimized	3	2
		1a.5	Farm Ecosystem	The risk to biodiversity related to the use and storage of agro-chemical, fertilizer and fuel is minimized.	3	3
		1a.6	Farm Ecosystem	GMO-use related risks to ecosystems and biodiversity are minimized.	1	1
		1a.7	Energy & Materials	Waste material re-cycling and re-use is maximized (waste to landfill is minimized).	3	2
1b. Optimize	The key inputs into the farming process are utilized optimally.	1b.1	Water	Water-use for irrigation is optimized.	2	3
		1b.2	Water	The loss/wastage of stored and/or transferred water is minimized.	3	3
		1b.3	Energy & Materials	Direct energy-use is optimized.	2	3
		1b.4	Energy & Materials	Fertilizer use is optimized.	2	3
		1b.5	Energy & Materials	Agro-chemical use is optimized.	2	3
2a. Reduce	The use of non-renewable based energy and materials is reduced to levels where environmental degradation associated with their use no longer occurs.	2a.1	Water	There is no leaching of fertilisers and/or agro-chemicals to ground and/or surface water.	2	3
		2a.2	Soil	Orchard soils are net carbon sequesters (Soil carbon is increasing).	2	2
		2a.3	Farm Ecosystem	There is no net release of greenhouse gasses to the atmosphere.	1	2
		2a.4	Farm Ecosystem	Land-use change is curtailed.	3	2
		2a.5	Energy & Materials	Farm productivity is not dependent on the supply of non-renewable based energy (there is a sufficient supply of local renewable based energy to support ongoing farm productivity).	1	2
		2a.6	Energy & Materials	The nutrient needs of the crop are not dependent on the input of inorganic fertilizers (the nutrient cycling and supply capabilities of the farm ecosystem are sufficient to meet the crop's nutrition needs).	2	3
		2a.7	Energy & Materials	The control of pests & diseases is not dependent on non-renewable based agro-chemicals (the pest & disease suppression capabilities of the farm ecosystem are sufficient to meet the crop's pest & disease control needs).	2	3
2b. Restore	The self-regulating and self-sustaining capacity of the farm ecosystem is restored and/or conserved.	2b.1	Water	Watercourses and riparian areas arising on or passing through the farm are restored and/or conserved.	3	3
		2b.2	Water	Any wetland areas and seep zones on the farm are restored and/or conserved.	1	1
		2b.3	Soil	The natural biodiversity and biological functioning of the soil is restored and/or conserved.	2	2
		2b.4	Farm Ecosystem	Over-aggressive and abundant species are identified and controlled.	2	2
		2b.5	Farm Ecosystem	Fire is appropriately managed.	3	3
		2b.6	Farm Ecosystem	Areas of structurally complex (climax) natural vegetation are set-aside for conservation	3	3
		2b.7	Farm Ecosystem	Cultivated areas of the farm are maintained in a structurally complex state (they mimic the structural complexity of the natural component)	2	2
		2b.8	Farm Ecosystem	Buffer zones of naturally occurring vegetation are established and conserved around ecologically sensitive areas.	2	2
		2b.9	Farm Ecosystem	Corridors and "stepping stones" of natural vegetation that enable biodiversity & ecological connectivity across the landscape are in place.	1	1
		2b.10	Farm Ecosystem	Natural species diversity and keystone species are restored and/or conserved.	1	1
3. Sustain	The majority of farms and land-users across the shared agro-ecosystem are engaged in supporting the long term environmental sustainability of the agro-ecosystem as a whole.	3.1	Soil	The achievement of Levels 1 & 2 for "Soil" being pursued by the majority of land users across shared catchment.	2	2
		3.2	Water	The achievement of Levels 1 & 2 for "Water" is being pursued by the majority of land users across shared catchment.	2	2
		3.3	Ecosystem & Biodiversity	The achievement of Levels 1 & 2 for "Farm Ecosystem" is being pursued by the majority of land users across shared catchment.	1	2
		3.4	Energy & Materials	The achievement of Levels 1 & 2 for "Energy & Materials" is being pursued by the majority of land users across shared catchment.	2	2

Template of the SIZA Environmental Performance Assessment Report

Ref	Focus	Principle	Criteria	Score	Management Category
1a.2	Soil	Minimize	The loss of soil through erosion is minimized.	9	At Destination
1a.7	Energy & Materials	Optimize	Waste material re-cycling and re-use is maximized (waste to landfill is minimized).	9	At Destination
1b.1	Water	Optimize	Water-use for irrigation is optimized.	9	At Destination
1b.2	Water	Optimize	The loss/wastage of stored and/or transferred water is minimized.	9	At Destination
1b.4	Energy & Materials	Optimize	Fertilizer use is optimized.	9	At Destination
1b.5	Energy & Materials	Optimize	Agro-chemical use is optimized.	9	At Destination
2a.2	Soil	Stop	Orchard soils are net carbon sequesters (Soil carbon is increasing).	9	At Destination
2b.5	Farm Ecosystem	Restore	Fire is appropriately managed.	9	At Destination
2b.7	Farm Ecosystem	Restore	Cultivated areas of the farm are maintained in a structurally complex state (they mimic the structural complexity of the natural component)	9	At Destination
2b.8	Farm Ecosystem	Restore	Buffer zones of naturally occurring vegetation are established and conserved around ecologically sensitive areas.	9	At Destination
1a.1	Water	Minimize	The risk to water resources related to the storage and use of agro-chemicals, fertilizers and fuel is minimized.	8	On Journey
1a.3	Soil	Minimize	Soil compaction is minimized	8	On Journey
1a.4	Soil	Minimize	The risk of salinization and/or waterlogging of irrigated lands is minimized	8	On Journey
1a.5	Farm Ecosystem	Minimize	The risk to biodiversity related to the use and storage of agro-chemical, fertilizer and fuel is minimized.	8	On Journey
2b.1	Water	Restore	Watercourses and riparian areas arising on or passing through the farm are restored and/or conserved.	8	On Journey
2b.3	Soil	Restore	The natural biodiversity and biological functioning of the soil is restored and/or conserved.	8	On Journey
3.4	Energy & Materials	Sustain	The achievement of Levels 1 & 2 for "Energy & Materials" is being pursued by the majority of land users across shared catchment.	8	On Journey
1b.3	Energy & Materials	Optimize	Direct energy-use is optimized.	7	On Journey
2a.1	Water	Stop	There is no leaching of fertilisers and/ir agro-chemicals to ground and/or surface water.	5	Good Fortune
2a.6	Energy & Materials	Stop	The nutrient needs of the crop are not dependent on the input of inorganic fertilizers (the nutrient cycling and supply capabilities of the farm ecosystem are sufficient to meet the crop's nutrition needs).	5	Good Fortune
2a.7	Energy & Materials	Stop	The control of pests & diseases is not dependent on non-renewable based agro-chemicals (the pest & disease suppression capabilities of the farm ecosystem are sufficient to meet the crop's pest & disease control needs).	5	Good Fortune
2b.4	Farm Ecosystem	Restore	Over-aggressive and abundant species are identified and controlled.	5	Good Fortune
3.1	Water	Sustain	The achievement of Levels 1 & 2 for "Water" being pursued by the majority of land users across shared catchment.	5	Good Fortune
3.2	Soil	Sustain	The achievement of Levels 1 & 2 for "Soil" is being pursued by the majority of land users across shared catchment.	5	Good Fortune
3.3	Farm Ecosystem	Sustain	The achievement of Levels 1 & 2 for "Farm Ecosystem"is being pursued by the majority of land users across shared catchment.	5	Good Fortune
2a.4	Farm Ecosystem	Stop	Land-use change is curtailed.	4	Good Fortune
2a.3	Farm Ecosystem	Stop	There is no net release of greenhouse gasses to the atmosphere.	3	Blind Spot
2a.5	Energy & Materials	Stop	Farm productivity is not dependent on the supply of non-renewable based energy (there is a sufficient supply of local renewable based energy to support ongoing farm productivity).	3	Blind Spot
1a.6	Farm Ecosystem	Minimize	GMO-use related risks to ecosystems and biodiversity are minimized.	1	Blind Spot
2b.2	Water	Restore	Any wetland areas and seep zones on the farm are restored and/or conserved.	1	Blind Spot
2b.6	Farm Ecosystem	Restore	Areas of structurally complex (climax) natural vegetation are set-aside for conservation	1	Blind Spot
2b.9	Farm Ecosystem	Restore	Corridors and "stepping stones" of natural vegetation that enable biodiversity & ecological connectivity across the landscape are in place.	1	Blind Spot
2b.10	Farm Ecosystem	Restore	Natural species diversity and keystone species are restored and/or conserved.	1	Blind Spot

Scoring Bar:
To the right – the Criterion is on management's radar.
To the left – The fulfillment of the Criterion is not being actively/purposefully managed.

Management Category:
Each category encourages a specific management response.

Color Coding:
Green – Amber – Red, indicates increasing potential weakness/risk, and therefore increasing priority for management response.

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Environmental Performance Assessment Focus and Approach

The EPA tool has 4 key focus areas: **Soil, Water, Energy** and **Materials, Farm Ecosystems**
And questions focus on you obtaining an understanding of what **your action/response needs to be** in relation the criteria i.e. Actions: **Reduce/Minimise, Optimise, Sustain, Stop**

Ref	Focus	Principle	Criteria	Management Category	Focus of Improvement Effort: Strategic Capacity & commitment	Performance Tracking & Assessment Capacity	Planning & Execution Capacity	Practical Outcome	Measured Outcome
2a.7	Energy & Materials	Reduce	The conversion of areas of natural vegetation for cultivation is curtailed.	At Destination	✔	✔	✔	✔	✔
2a.3	Energy & Materials	Reduce	Ongoing farming operations are not dependent upon the supply of non-renewable based energy (there is sufficient supply of renewable-based energy to support normal farming operations).	On Journey	✔	✔	✔	✔	✗
2a.6	Energy & Materials	Reduce	There is no net release of greenhouse gasses to the atmosphere.	On Journey	✔	✔	✔	✔	✗
1b.3	Energy & Materials	Optimize	Direct energy-use is optimized.	Good Fortune	✗	✔	✔	✔	✔
1a.5	Energy & Materials	Minimize	The negative environmental impacts associated with waste generated on the farm, are minimized.	Good Fortune	✔	✗	✔	✔	✗
2a.4	Energy & Materials	Reduce	The nutrient needs of the crop are not dependent upon inorganic fertilizers (the nutrient recycling and supply capability of the farm ecosystem is sufficient to meet the crop's nutrition needs).	Good Fortune	✗	✗	✔	✔	✗
1b.4	Energy & Materials	Optimize	Inorganic fertilizer use is optimized.	Blind Spot	✗	✗	✗	✔	✗
1b.5	Energy & Materials	Optimize	Agro-chemical use is optimized.	Blind Spot	✗	✗	✗	✔	✗
2a.5	Energy & Materials	Reduce	The control of pests & diseases is not dependent upon non-renewable based agro-chemicals (the natural pest & disease suppression capabilities of the farm ecosystem is sufficient to meet the crop's pest & disease control needs)	Blind Spot	✗	✗	✗	✗	✗
3.3	Energy & Materials	Sustain	The achievement of Levels 1 & 2 for "Energy & Materials" is being pursued by the majority of land users across the shared agro-ecosystem and/or the farm participates in specific programs/initiatives aimed at achieving sustainable management of farm ecosystems for the agro-ecosystem as a whole.	Blind Spot	✗	✗	✗	✗	✗
1a.10	Energy & Materials	Minimize	Emissions to air related to farming activites and on-farm operations are minimized	n/a	-	-	-	-	-
1b.8	Energy & Materials	Optimize	The re-use, recycling and recovery of waste materials generated on the farm, is optimized.	n/a	-	-	-	-	-

Take Home Message

- Welcome to indicate interest in using the EPA tool (through your CGA channels)
- Complete the Self Assessment Questionnaire – establish your own initial benchmark and determine your own appetite for focus areas of work
- CGA – will use this tool to identify key issues in citrus production with year 1 focus on WATER.
- Able to develop focused interventions to assist sector in response to addressing key water challenges
- Register and interact with the SIZA Platform if you haven't already done so….

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Thank you

Inge Kotze
WWF Senior Manager: Sustainable Agriculture
ikotze@wwf.org.za

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