Southern Africa Soy Roadmap – South Africa value chain analysis

November 2010 – February 2011




TechnoServe
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Acknowledgements

This assessment has been developed in collaboration with the National Agricultural Marketing Association (NAMC), who conducted a similar value-chain analysis on the soy industry within South Africa. We would like to thank NAMC for their assistance, effort, and aid in this presentation. The data, statements, and analysis within this presentation are not necessarily representative of NAMC.

Executive summary (1/4)

- **The South African soy market is the largest and most mature in the region; production is dominated by commercial farmers with continued future growth**
  - South Africa is a net importer of soy, with **production of 588k MT** and **consumption of 1.3m MT** soybeans for **soy oil** and **1.6m MT** soybeans for **soy cake**
  - **98%** of the industry is made up of production from **commercial farmers**
  - The soy industry in South Africa is split between **production areas in Mpumalanga, Free State, and ZwaZulu-Natal** and **consumption areas in the main cities**
  - The **cake market** (1.6k MT in 2010) has been driven by the **growth of the poultry industry** which drives demand for poultry feed
  - **This is expected to continue**, with the **cake market** rising to **1.8m MT domestic market by 2015**
  - The **oil market** (1.3k MT in 2010) has been driven by the growth in soy oil consumption for cooking oil and bio-diesel
  - This growth in oil consumption is **expected to continue**, with the **soy oil market** rising to **2.1m MT domestic market by 2015**
  - In 2009, South Africa **imported 979k MT of soybean equivalent soy cake** and **745k MT of soybean equivalent soy oil**, both products mainly **from Argentina**
  - South Africa is well placed to continue **importing soy from its neighbors**, mainly in the form of soy oil and cake

Executive summary (2/4)

- **The strong soy market and relatively make soy a marginally attractive crop for commercial farmers, yet analysis of the soy value chain reveals some of the industry's shortfalls**
  - **Inputs**
    - Almost **all commercial farmers use improved soybean seeds and inoculants**
    - **40% of farmers use fertilizer and lime** due to South Africa's less than optimal soil conditions
  - **Production**
    - **Commercial farmers** generally have **good agronomic practices, achieving average yields of 1.9 MT/Ha**; smallholder farmers are said to have yields ranging from 0.5 to 1.0 MT/Ha
    - Soy is only **marginally attractive to commercial farmers on dryland** (production costs of $364/MT compared to farm gate prices of $383/MT). However, commercial farmers using irrigation could obtain larger profits (production costs of $310/MT) due to higher yields (3.0 MT/Ha)
    - Farmers rotate soy in with other staple crops such as maize as land for planting soy is constrained
  - **Processing**:
    - **Processing capacity** is currently at **1.9m MT oilseed inputs,** which is expected to **increase to 3.3m MT**; however, **only 540k MT of that capacity (29%) is being utilized** for soy processing
    - Processing decisions are generally **dependent on refiners**, who often **favor sunflower** over soybean processing out of necessity for inputs to keep refineries at 100% utilization
  - **Demand:**
    - Soy oil and soy cake demand will continue to increase, with soy oil demand potentially rising at a faster rate (14% p.a.) due to increased consumer demand and use of oil for bio-diesel
    - **Soy oil and cake demand** is projected to be **2.1m MT** and **1.8m MT** of soybean equivalent **by 2015**
  - **Enabling environment**:
    - SA's land reform, GMO Act, Bio-fuel, and tariff policies could affect the growth of the industry
    - SA's transport infrastructure is fairly good, yet, SA has had unreliable electricity and poor water quality

Executive summary (3/4)

- **Lack of land allocated to soy, lack of processing utilized for soy, and soy cake quality concerns inhibit the soy industry's growth**
  - **Land is currently a constraint for soy production**; in order to meet 2015 demand projections, land would have to increase by at least 69% (most pessimistic scenario), which would require reallocating land from maize to soy
  - Only **29% of soy processing capacity is being utilized**, most processing is being used for sunflower processing, due to backward integration of refineries, which could constrain domestic demand for soybeans
  - **Soy cake quality (protein content) inconsistencies could affect demand for locally-produced soy cake**, where feed manufacturers will turn toward better quality imports over domestically sourced cake
  - Possible changes in **soy import tariffs** could affect the growth of the domestic soy industry; if tariffs rebates are allowed, there **could be increased reliance on imported soy** vs. locally-produced soy products
  - **Land reforms could displace current commercial soy farmers**, which could decrease soy production, while the **government's backing** of the Biofuel Industry Strategy could greatly **increase the demand for soy for bio-diesel feedstock**

Executive summary (4/4)

- **Therefore, South Africa must overcome these constraints and encourage farmers to allocate more land to soy to take advantage of the soy opportunity through a number of key initiatives**
  - Marketing campaign for crop rotation amongst commercial, new, and smallholder farmers
  - Improved soy cake processing standards
  - Soy association formation
  - Soy nutrition campaign and extension services
  - Post land reform assistance

- **In order to achieve the land reallocation goal, smallholder farmers must graduate to emerging farmers**
  - South Africa's land reform goal of 30% reallocation of agricultural land to the rural poor is contingent on developing smallholder farmers into emergent farmers
  - For smallholder farmers to make the most of their newly acquired land, soy must become culturally acceptable in diets and partnerships between commercial and farmers must increase

Agenda

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South Africa is one of the largest countries in the region located at the southern tip of Africa

Geography

- 1.2m sq. km of **area** (0.34% water; 12.1% arable land)
- **Boundaries** with **Botswana** (1,840 km), **Lesotho** (909 km), **Mozambique** (491 km), **Namibia** (967 km), **Swaziland** (430 km), and **Zimbabwe** (225 km). **2,798 km of coastline**
- **Mostly semi-arid** and **subtropical** along the east coast

People

- **40.1 million** (0.28% growth rate), **mostly middle-aged** (66% between 15-64 yr) and **urbanized** (61%, with 1.4% increase in urban population p.a.)
- **High rate of literacy** (86.4%), about equal for men and women
- **Low life expectancy** (49 yrs), and **high HIV/AIDS count** (5.7 million)

Politics

- **Republic**, with **independence in 1910** from Britain (UK), declared republic in 1961, majority rule in **1994**
- History of **apartheid** (legally institutionalized segregation), which ended in 1994, has left racially-based scars on the country

Economy

- **GDP per capita** of $10.3k; 50% of **population below poverty line**
- **Services is the main economic sector** (65.8% of GDP). **Agriculture (3% of GDP) occupies 9% of the labor force**
- It is the **world's largest producer of platinum, gold, and chromium.**

Energy, communications, and transportation

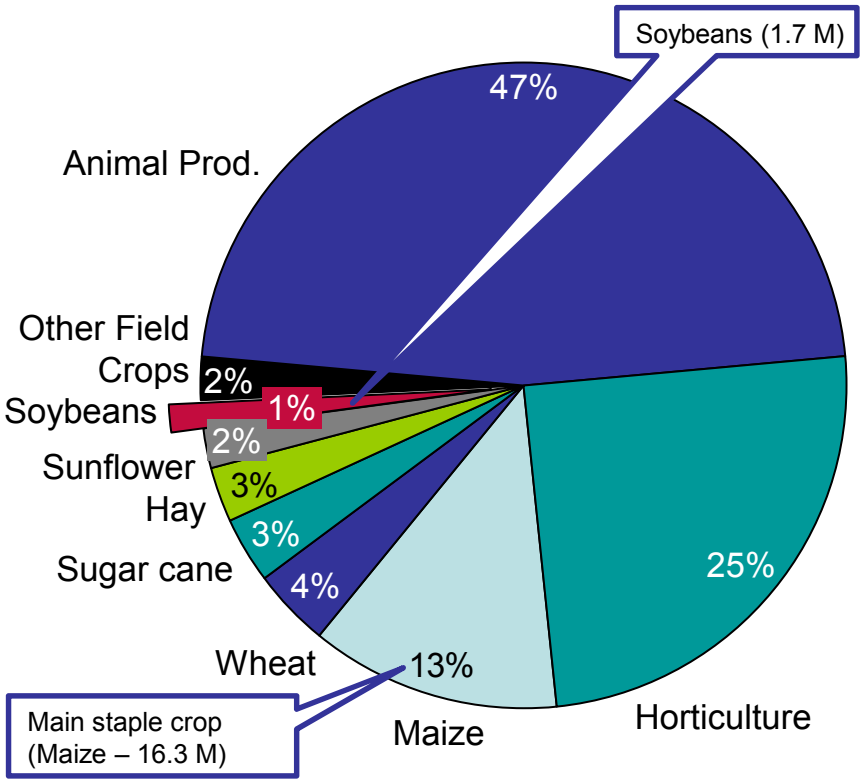
- 4.4 million telephones, **45 million mobile phones**, 4.2 million internet users
- 578 airports, 5 ports, 362k km of roadways (of which a more than **80% are not paved**), 20.8k km of railway

Source: CIA Factbook, 2009

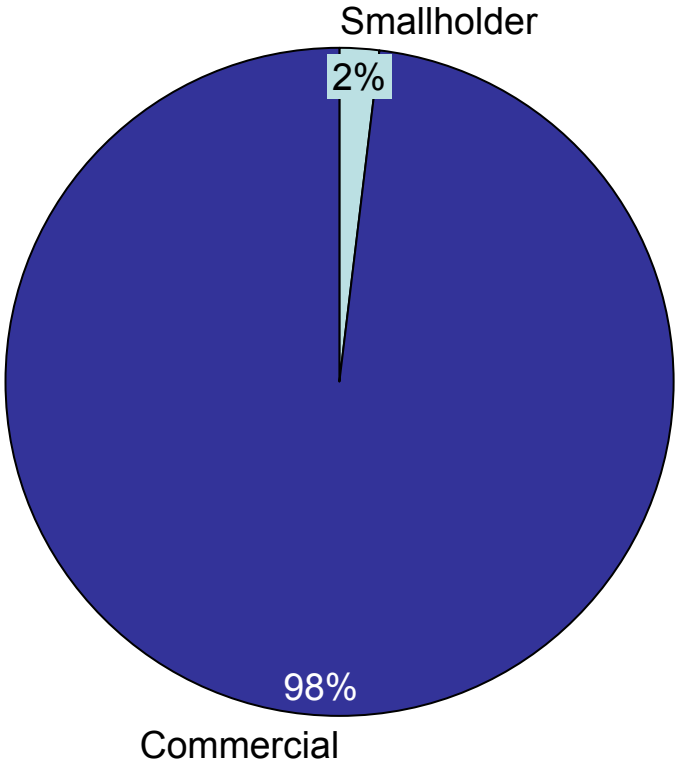
Commercial farmers and animal production currently dominate South Africa; soy is one of the smallest cash crops, while maize is the main crop

Breakdown of agricultural output, %
2009, 100% = $173b USD

Breakdown by agricultural output

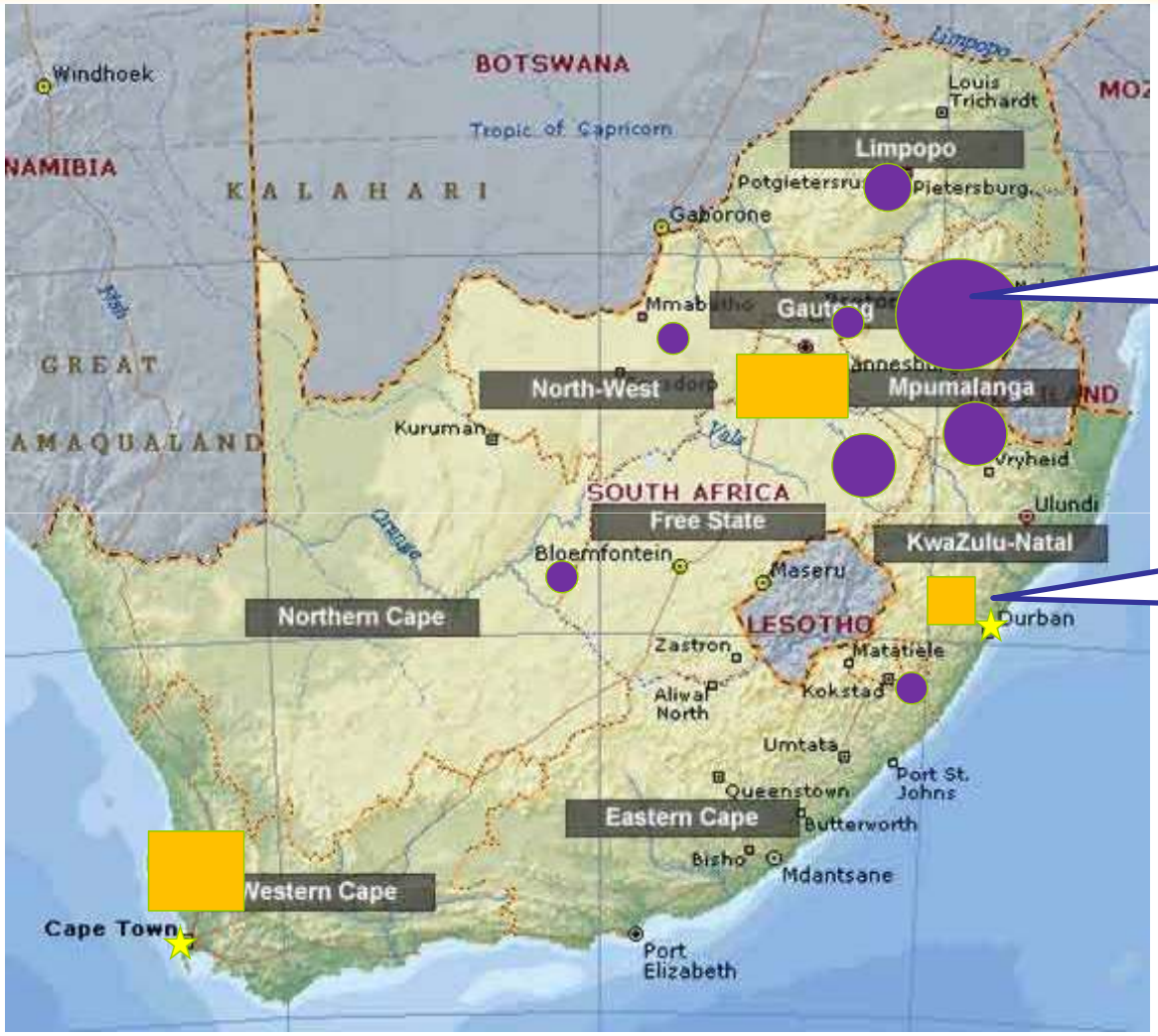


Commercial vs. smallholder



Source: DAFF: Abstract of Agricultural Statistics, 2010
Report on the Survey of Large and Small Scale Agriculture, 2002

The soy industry in South Africa is split between major production areas in Mpumalanga, Free State, and KZN with demand centers in major cities



Key soy production areas are in Mpumalanga, KwaZulu-Natal (KZN), and Free State

Demand centers exist in the major cities including: Johannesburg, Cape Town, and Durban

Legend

- Main port
- Production area
- Demand area

Source: Grain SA/ Graan SA

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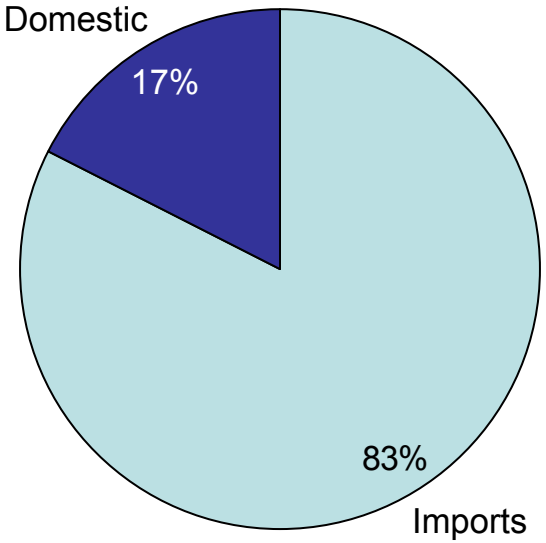
South Africa is a net importer of soy cake, importing 83% of its soy cake, mainly from Argentina

Domestic consumption of soy cake by source and imports, %

Domestic consumption of soy cake by source

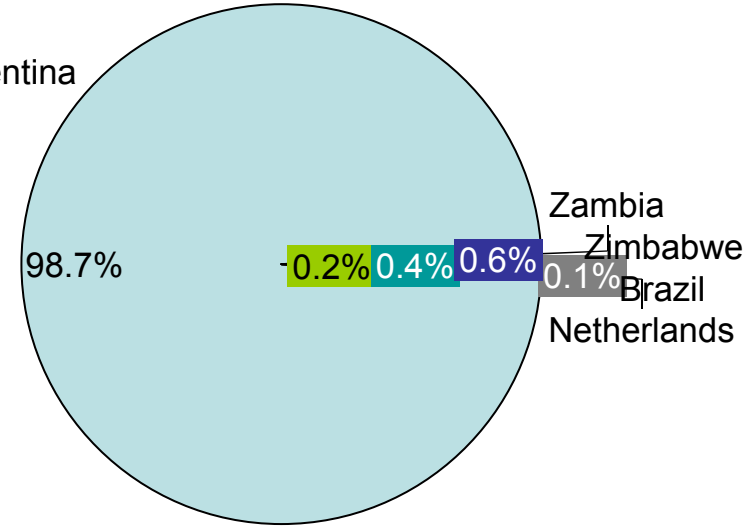
2010, 100% = 1,101k MT soy cake



- Domestic production does not include domestically-produced full fat soy cake, which accounts for 213k MT

Imported soy cake by origin

2009, 100% =979k MT soy cake



- Argentina is known to have high quality 48% protein soy cake

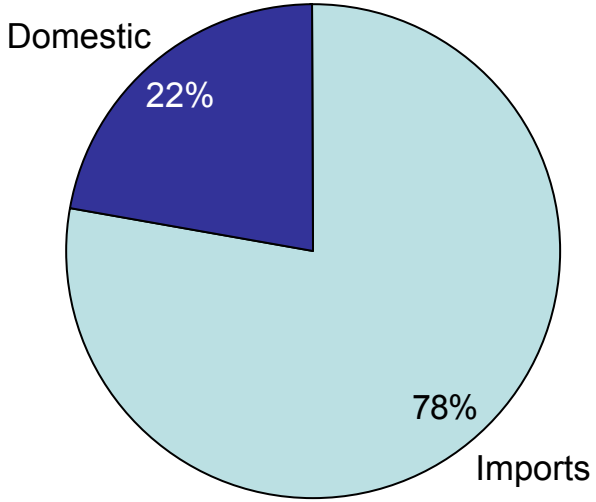
Source: TechnoServe Interviews, January 2011; BFAP; FAOSTAT 2009, World Atlas 2010

South Africa also has a strong demand for soy oil, importing 78% of its soy oil, mainly from Argentina and Brazil

Domestic consumption of soy oil by source and imports, %

Domestic consumption of soy oil by source

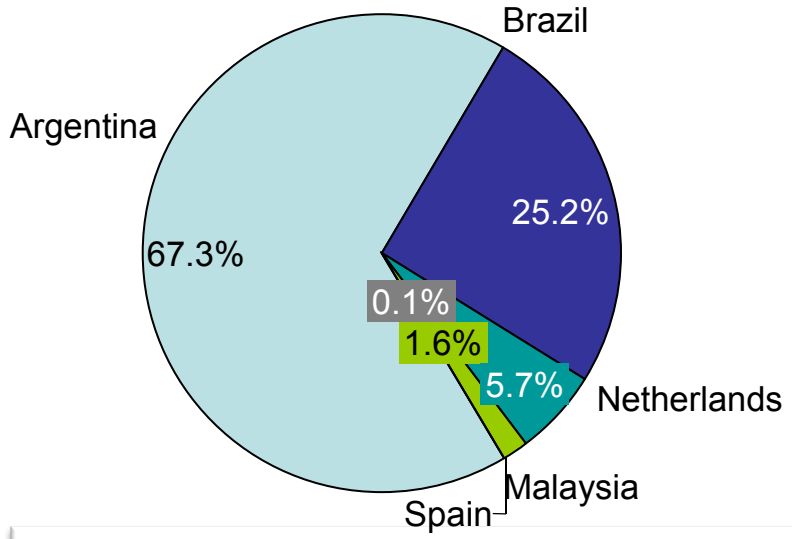
2010, 100% = 194k MT soy oil



- Domestic production meets less than one-fourth of demand for soy oil
- Most demand is met through imported soy oil

Imported soy oil by origin

2009, 100% =150k MT soy oil



- Most soy oil is imported from Argentina and to a lesser extent, Brazil
- Crude oil is also imported mainly from Argentina
- The remaining 8% of imports came from Netherlands and other countries

Source: TechnoServe Interviews, January 2011; BFAP; FAOSTAT 2009, World Atlas 2010

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- The strong soy market and relatively make soy a marginally attractive crop for commercial farmers, yet analysis of the soy value chain reveals some of the industry's shortfalls
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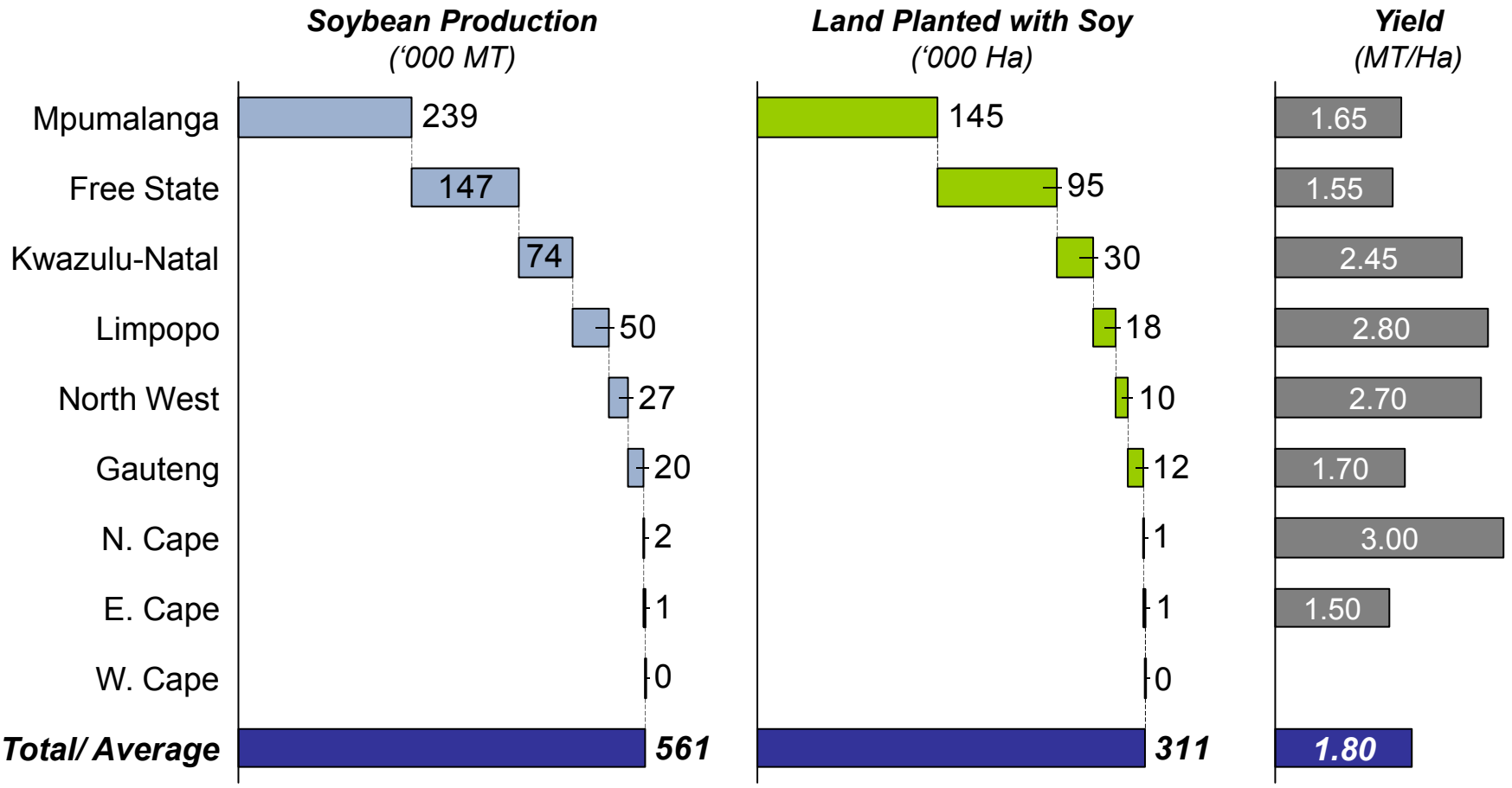
Mpumalanga, Free State, and Kwazulu-Natal have the largest soybean production and land areas and there is considerable variation in yields

Soybean Production, Land, and Yield by Province, 2009/2010*



Source: GrainSA/ GraanSA; *This excludes some of the production later in 2010, which should total 588k MT

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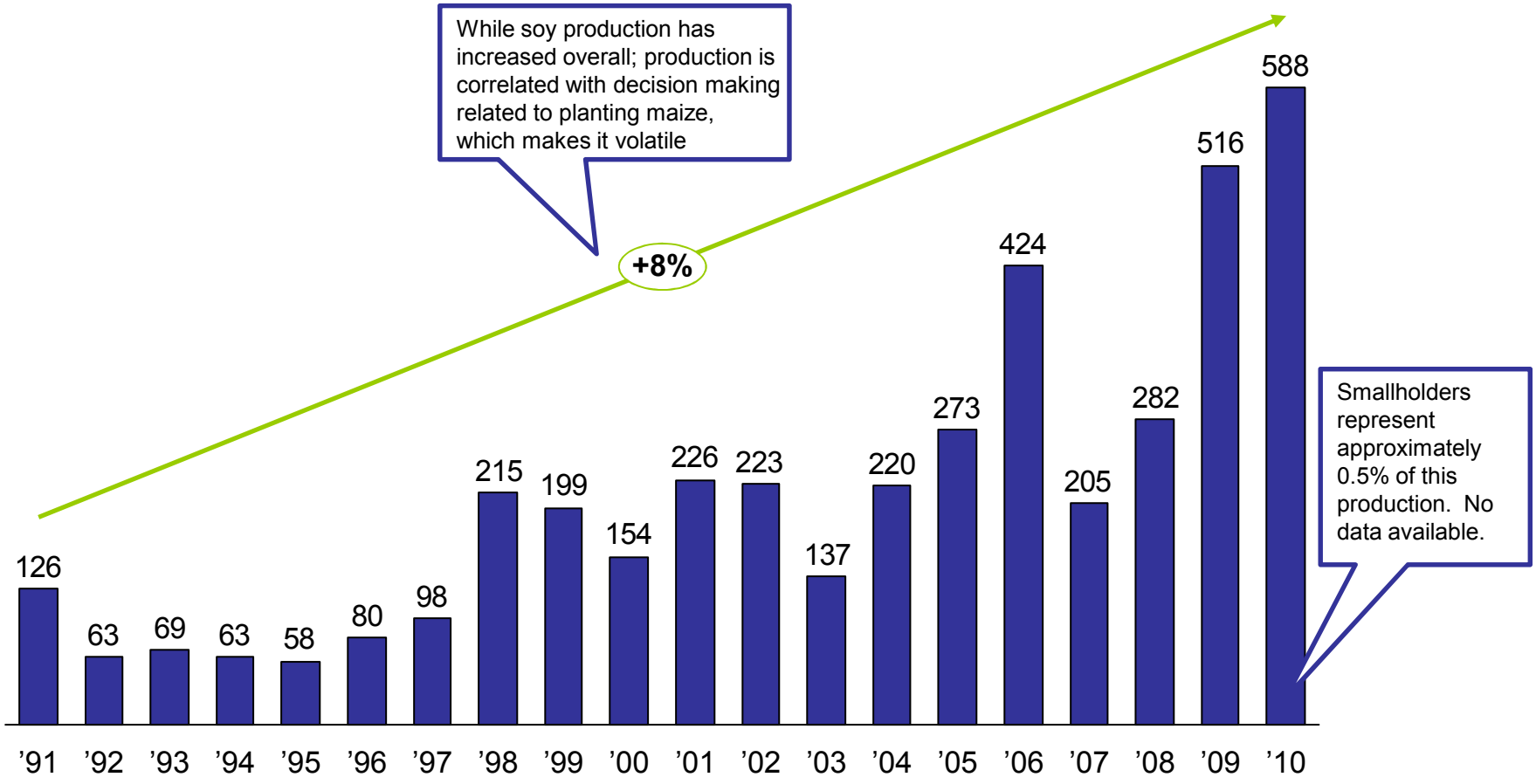
Soy production has grown by 8% p.a. over the last 19 years as commercial farmers have expanded production rapidly

Soybean Production,
1991-2010, '000 MT



Source: Grain SA/ Graan SA; Years represent the later year of the split production year (i.e., 2010 represents 2009/2010 harvest season)

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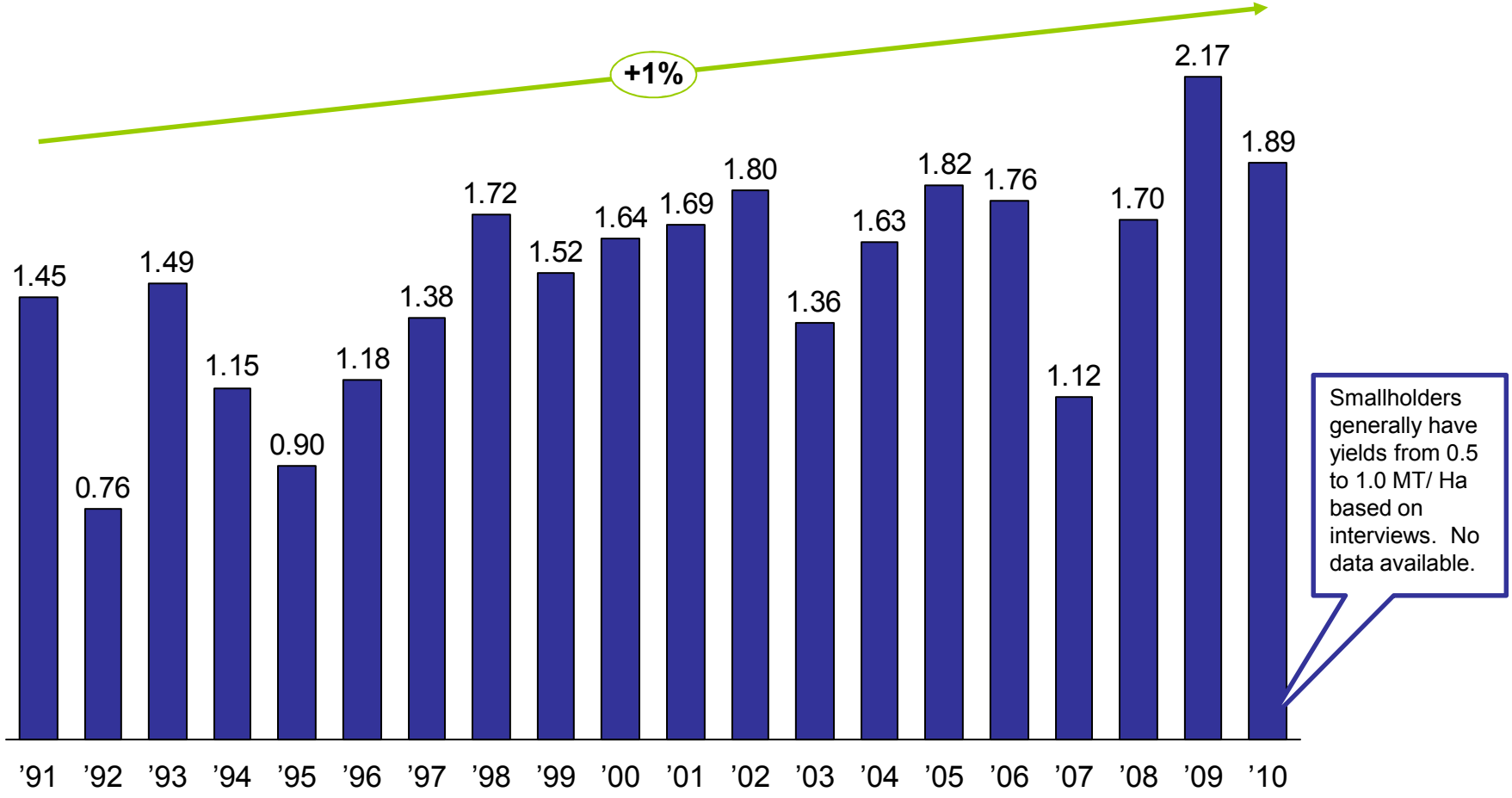
Soy yield has grown by 1% p.a. over 19 years, with significant variation over time

Soybean Yields,
1991-2010, MT/Ha



Source: Grain SA/ Graan SA; TNS Interviews, November 2010; Years represent the later year of the split production year (i.e., 2010 represents 2009/2010 harvest season)

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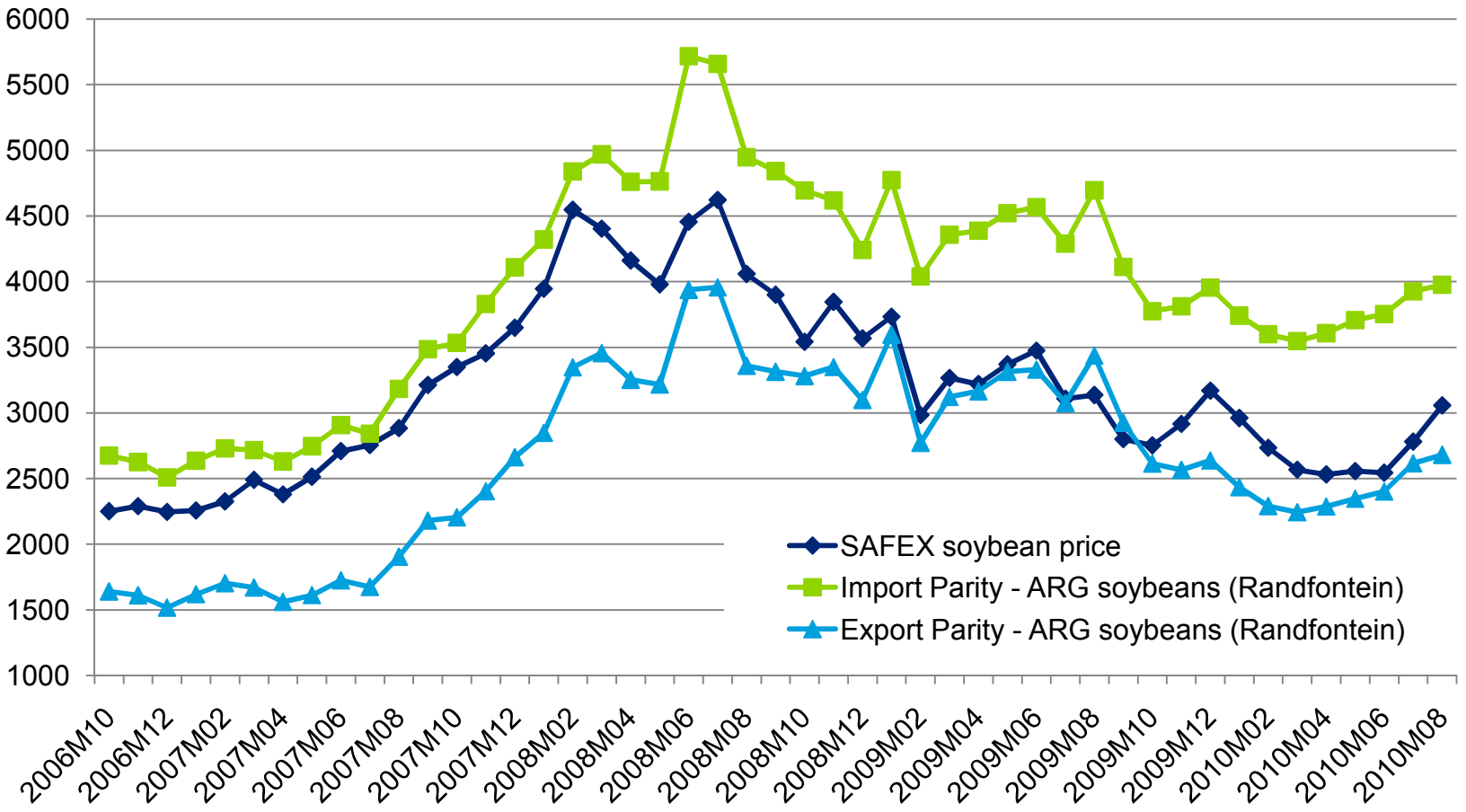
South Africa's domestic production can compete with imported soybeans, but cannot export competitively



Source: BFAP, 2010; GrainSA; SAGIS

*Import parity is defined as CIF for Durban + financing, import tariffs and costs + transport to Randfontein; Export parity is defined as Durban FOB + loading costs + transport from Durban to Randfontein

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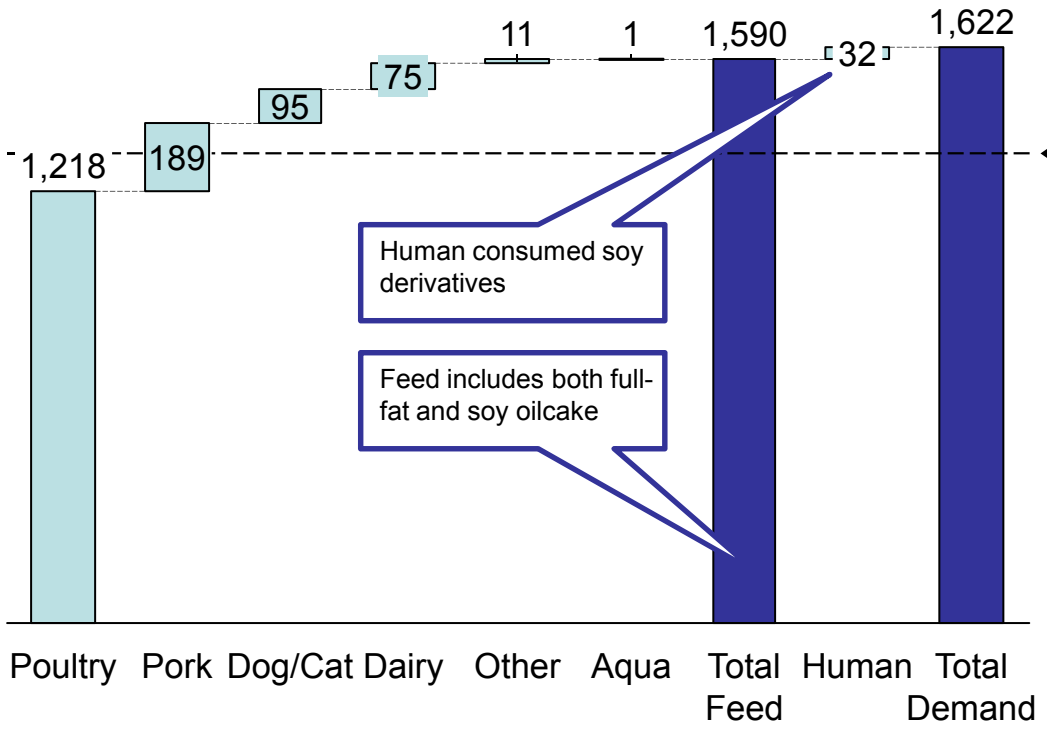
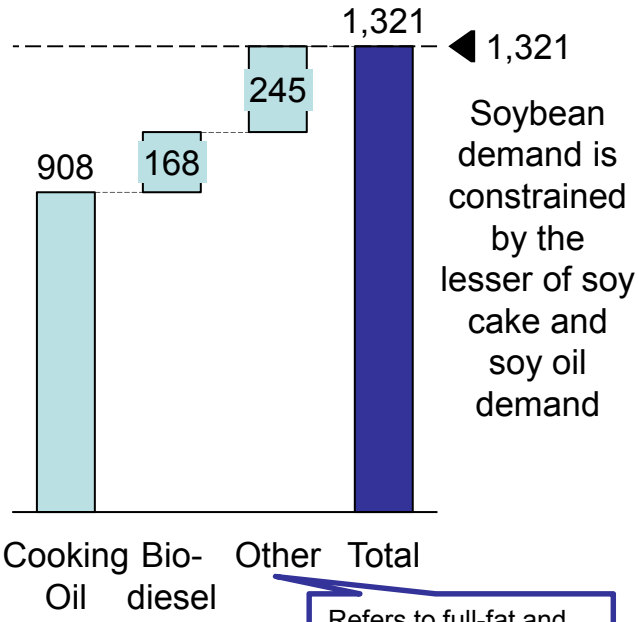
The soy market is constrained by the demand for soy oil and secondarily cake demand for poultry and pork feed

Soybean demand for soy cake[1]
2010, '000 MT soybean equivalent[2]



Soybean demand for soy oil
2010, '000 MT soybean equivalent[2]



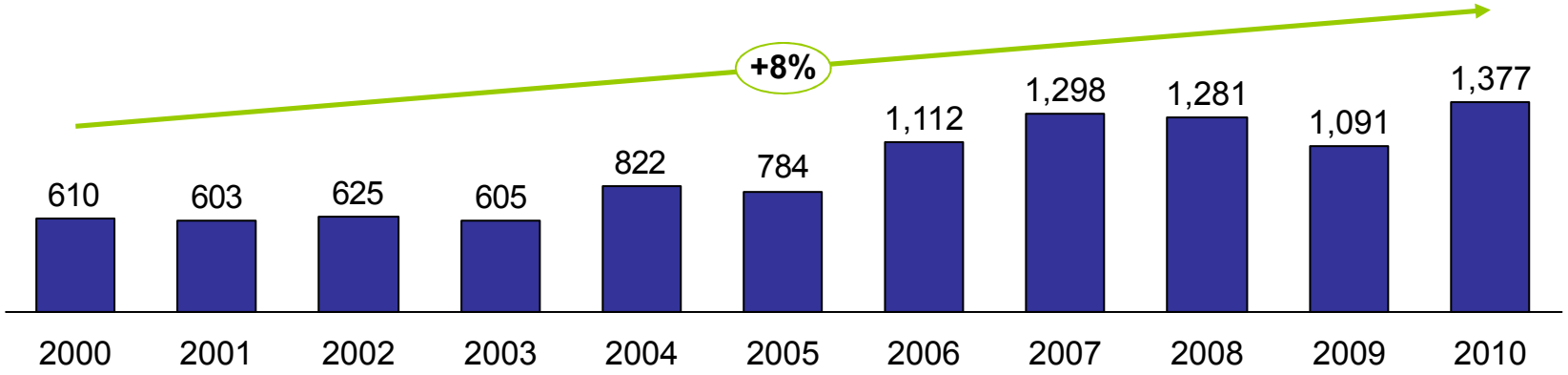
Soybean demand is constrained by the lesser of soy cake and soy oil demand

There is demand for 1.3m MT of soybeans in South Africa today constrained by soy oil demand from cooking oil and bio-diesel

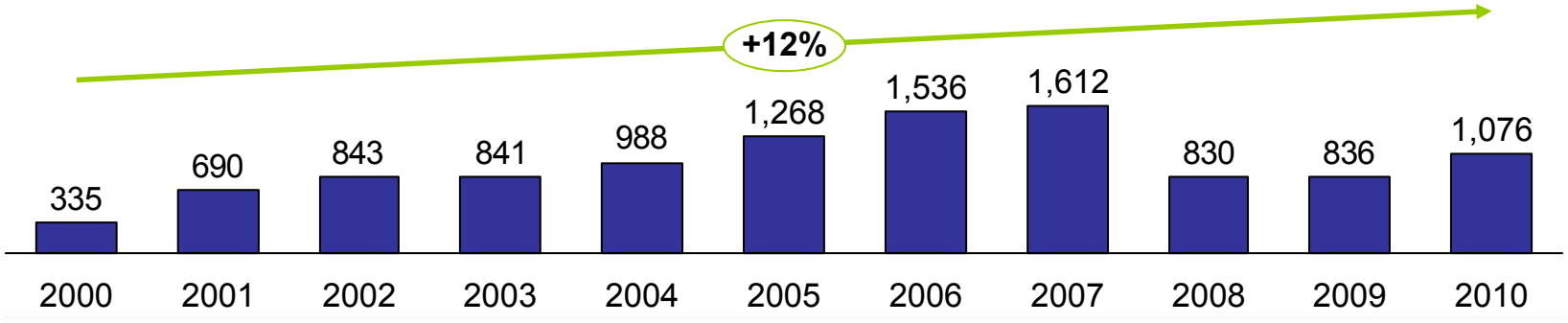
Source: Protein Research Foundation, [1]Projected ratio by industry from 2007 statistics; [2]Soybean equivalent is the amount of soybeans it takes to produce soy oil or cake (0.18 and 0.8 MT soybeans to produce of 1MT of soy oil and soy cake, respectively)

The growth in demand for soy oil by 12% p.a. has driven the rapid growth in demand for soy products

Demand for soy cake (excluding full-fat and human),
2000-2010, '000 MT soybean equivalent[1]



Demand for soy cooking/biodiesel oil,
2000-2010, '000 MT soybean equivalent[1]



Source: BFAP, 2010
[1]Soybean equivalent is the amount of soybeans it takes to produce soy oil or cake (0.18 and 0.8 MT soybeans to produce of 1MT of soy oil and soy cake, respectively)

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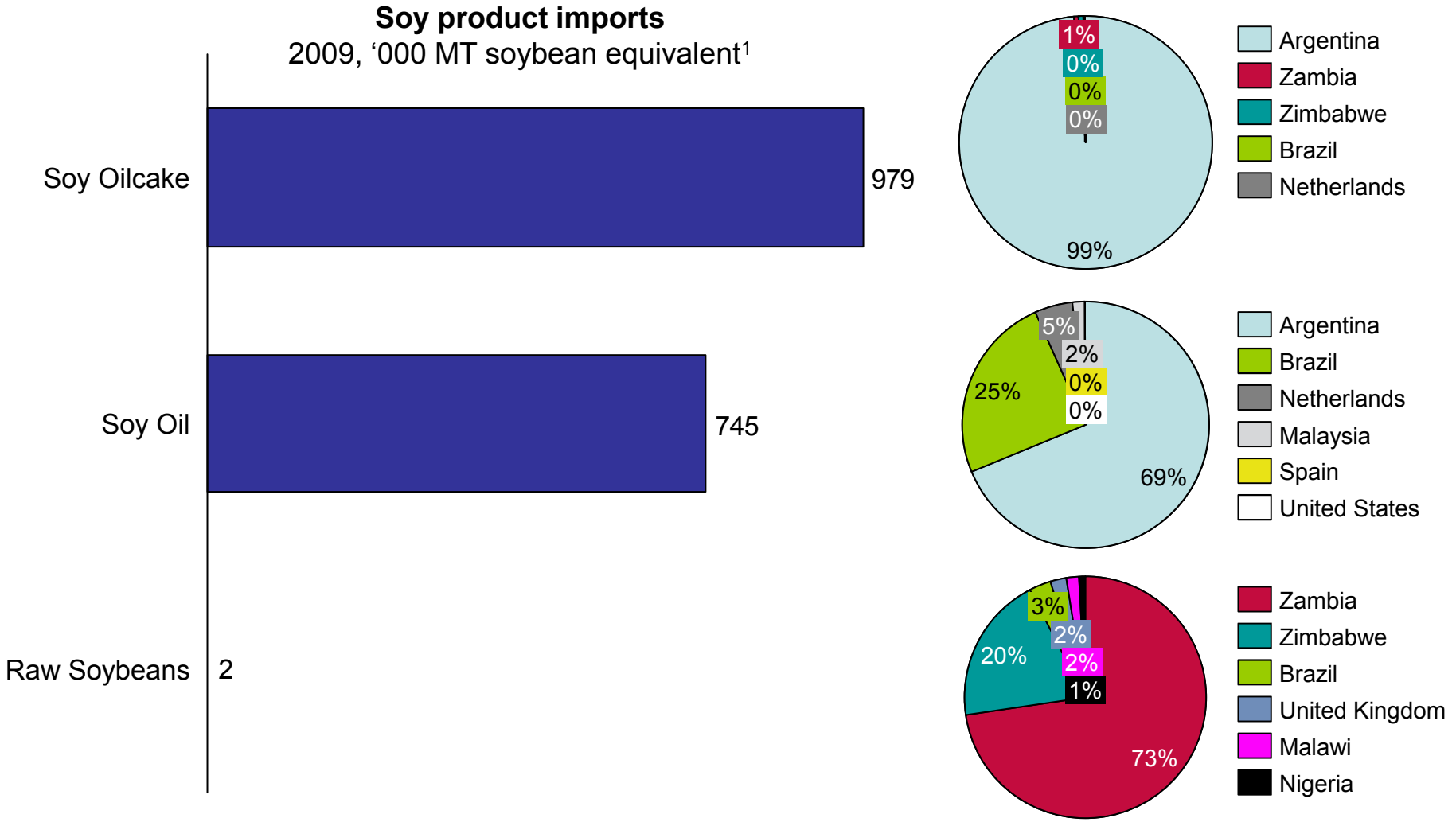
South Africa largely imports soy oilcake and oil, predominantly from Argentina and Brazil



Source: SARS, 2009;
[1]Soybean equivalent is the amount of soybeans it takes to produce soy oil or cake (0.18 and 0.8 MT soybeans to produce of 1MT of soy oil and soy cake, respectively)

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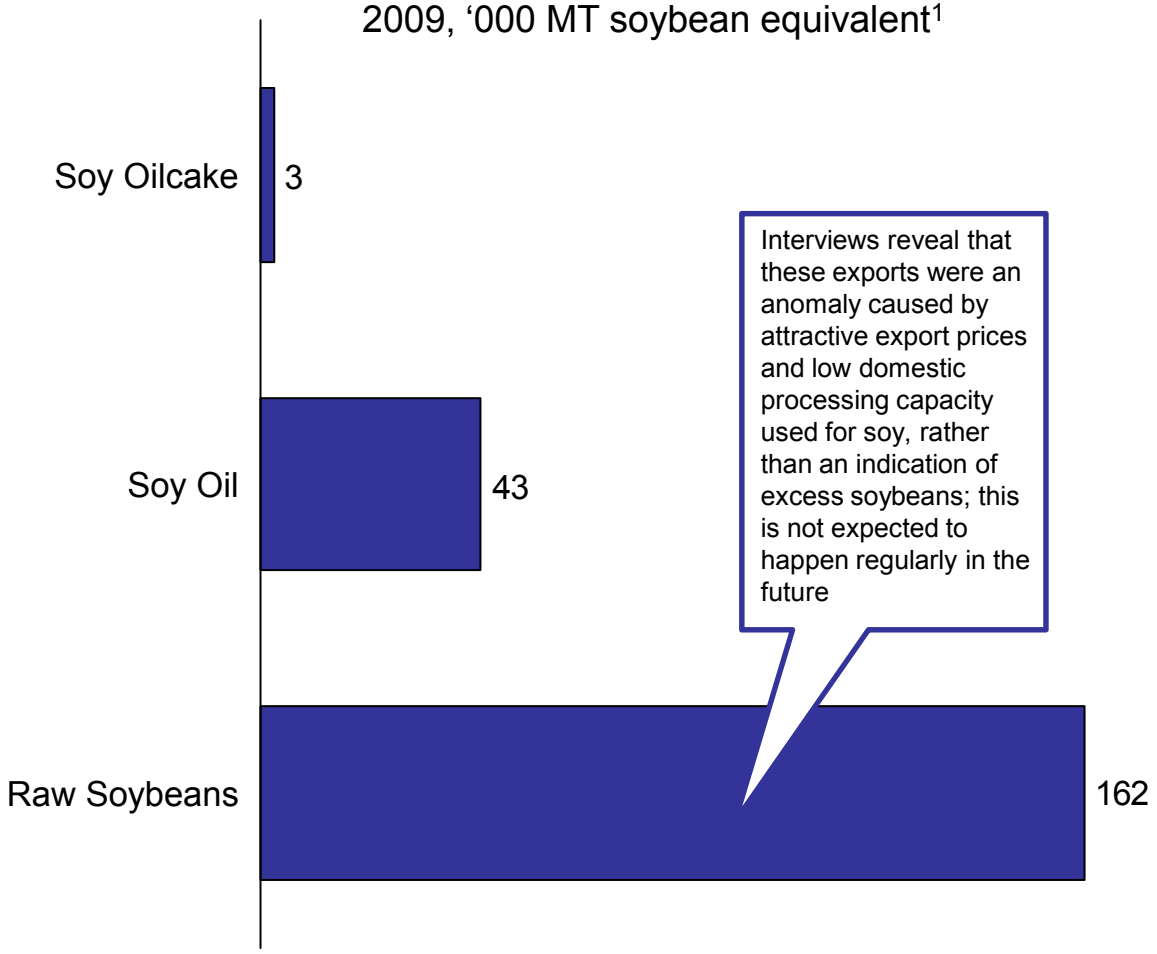
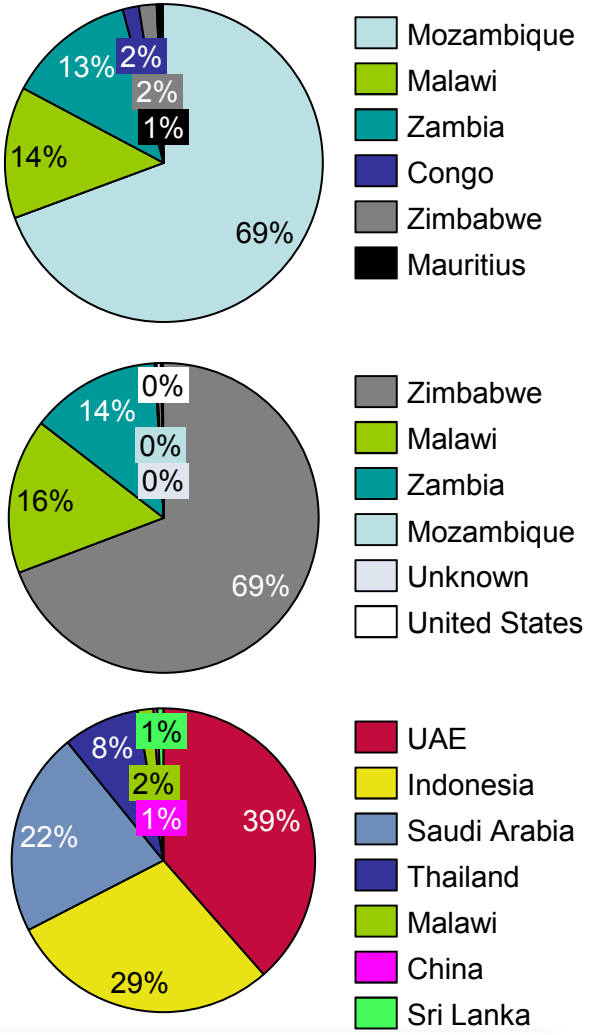
While South Africa exported soybeans in the past, this is not expected to persist

Soy product exports
2009, '000 MT soybean equivalent[1]





Source: SARS, 2009; TechnoServe Interviews, January 2011

[1]Soybean equivalent is the amount of soybeans it takes to produce soy oil or cake (0.18 and 0.8 MT soybeans to produce of 1MT of soy oil and soy cake, respectively)

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Destination country's GMO policies restrict raw soybean exports to other countries in the region

Destination for South Africa Raw Soybean exports

	Malawi	Zimbabwe	Zambia
Transport/ Duties costs ($USD/MT)	Transport: $165 (Johannesburg to Lilongwe)	Transport: $110 (Johannesburg to Harare)	Transport: $169 (Johannesburg to Lusaka)
Quality of transport	Fairly good road conditions, must also go through Zimbabwe	98% of roads from Harare to Durban are in good/fair condition (100% paved), yet highly traversed	97% of roads from Lusaka to Durban are in good/fair condition (100% paved), yet highly traversed
Policy restrictions	Restrict GM raw soybeans	Restrict GM raw soybeans	Restrict GM raw soybeans

Policy restrictions from neighboring countries restrict GM soybean (95% of all domestic soybeans) export within SADC

As long as processing utilization remains low and an opportunity presents itself, SA is likely to export outside the region (top export countries included UAE, Saudi Arabia, and Indonesia in 2009)

Source: Export Trading, Seed Co., Crop Link

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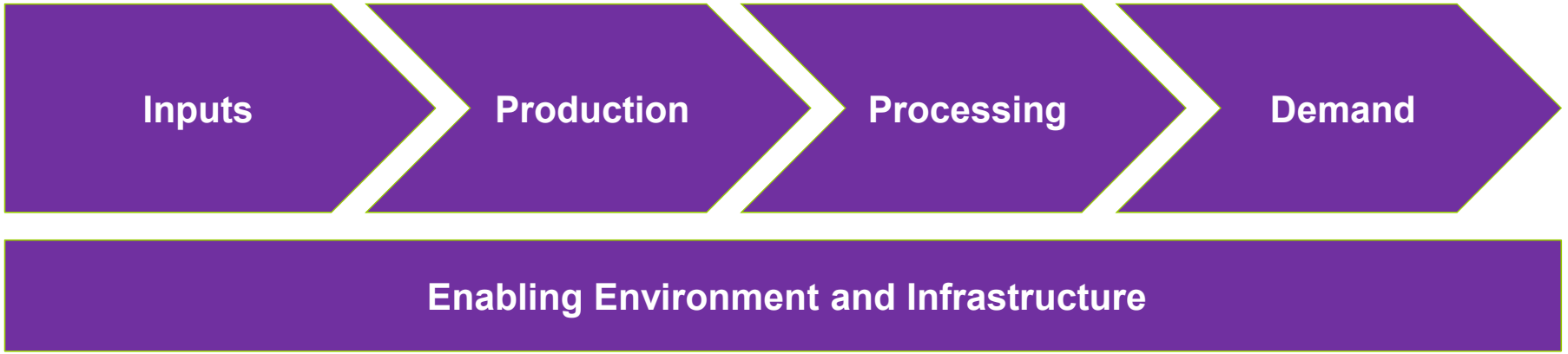
We have analyzed the soy industry by looking at the whole value chain



Inputs

Land preparation and mechanization (tillage); World News

Improved soybean seeds; Reuters, 2008

Commercial farmers, which represent 99% of the producers, use a high amount of inputs

Current Situation

- Most soy farmers are **commercial farmers**
- Soy is **not a new crop** in South Africa, soy production has been occurring for almost two decades
- South Africa's general agroclimatic conditions are not optimal for growing soy; therefore, **inputs are necessary to ensure that the land has the correct conditions**
- **Use of inputs is relatively high**, especially for improved seed, inoculants, fertilizers, and lime

Input Summary

- **Most farmers use improved seed and inoculants**
- **Almost half of all farmers also use fertilizer and lime**, which makes up a large proportion of their input costs
- Most farmers employ mechanization techniques
- Depending on the region, irrigation is used; however, there is enough scope to increase irrigation to increase yields
- **Farmers use necessary inputs**; however, there may be scope to increase yields through yield-enhancing cultivars from Argentina/Brazil

Source: TNS Pannar Seed Interview, FAO (2004), FSSA
Calculation: *312K Ha of soy land * 75kg/ha of soy seed

Improved seeds and inoculants are used by most farmers; 40% of land used for soy uses fertilizer, lime-use is increasing

	Current Situation	Current Capacity	Key Players
Seed	• 75% of commercial farmers use recycled soy seed, which is a common practice • Most seed used is genetically modified (GM) that is resistant to herbicides (85-90%)	• 23.4 M kg* of soy seed • Existing plants can deliver seed to meet market demand	• Pannar • Pioneer Seed • Link Seed.
Inoculants	• Almost all commercial farmers use inoculants • SA soil has a shortage of nitrogen-fixing bacteria, thus all soybeans must be inoculated	• Existing plants can deliver inoculants to meet market demand	• Stimuplant • Soy Grower
Fertilizer	• 40% of land used for soy production uses fertilizer, which could have scope to improve depending on soil conditions	• All Potassium imported • Almost all phosphate and up to 60% nitrogen are locally produced	• Foskor (Pty) • Omnia Fertilizer • Sasol Nitro • Yara SA (Pty) • Profert
Lime	• Lime and fertilizer represented a 23% contribution to input costs in 2008/09, indicating that there is significant use by farmers	• Existing plants can deliver lime to meet market demand	• Grasland Ondernemings • SA Lime and Gypsum • And more

Source: TNS Pannar Seed Interview, FAO (2004), FSSA
Calculation: *312K Ha of soy land * 75kg/ha of soy seed

Herbicide and pesticides are generally used by farmers, with most farmers employing mechanization techniques

	Current Situation	Current Capacity	Key Players
Herbicide	• Herbicides are used with GM Round-up Ready seeds • From 2008-2009, total value spent on herbicides more than doubled	• Existing distributors have herbicides to meet market demand	• Syngenta South Africa (multi-national) • Efkto .
Pesticides	• Pesticides are used, but generally are not used by a large number of farmers	• Existing distributors can deliver pesticides/ insecticides to meet market demand	• Syngenta South Africa (multi-national) • Efkto
Mechanization	• Most commercial farmers employ mechanized equipment to prepare land and to harvest soy	• Equipment is usually imported	• N/A
Irrigation	• Only some farmers utilize irrigation schemes, depending on the region • Scope exists to increase irrigation to increase yields	• Equipment is usually imported	• N/A

Source: TechnoServe January 2011 Interviews

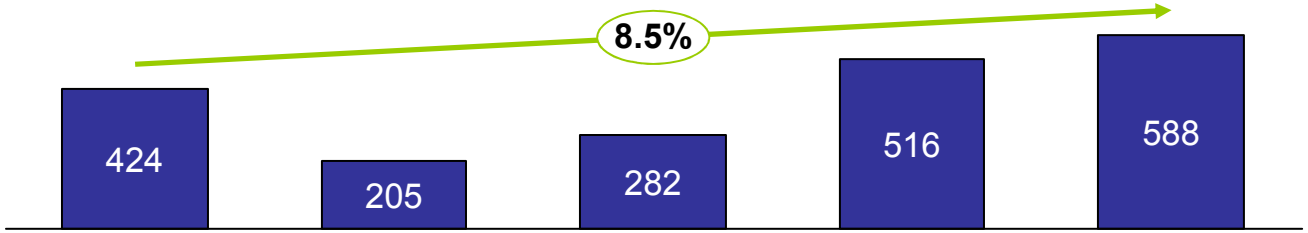
Production

Soy beans being grown on a farm in the bushveld, South Africa; Flickr

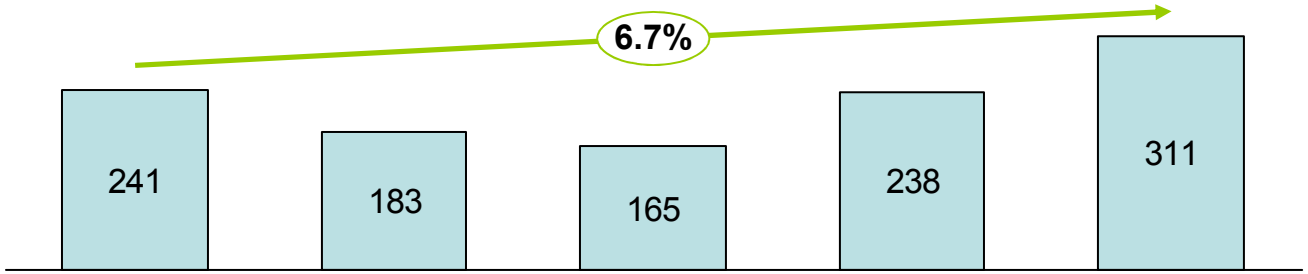
Example farmer plot with soy in South Africa; Smart Fertilizer

Over the past five years, soybean production has increased, mainly due to increases in areas planted with soybeans

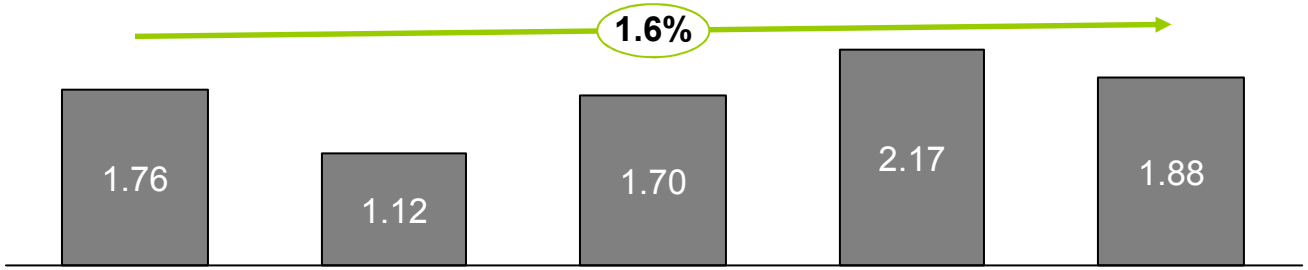
Soybean Production,
2006-2010, '000 MT



Land Planted for Soy,
2006-2010, '000 Ha



Soybean Yields,
2006-2010, MT/Ha



2006 2007 2008 2009 2010

Source: Grain SA/ Graan SA; BFAP; Years represent the later year of the split production year (i.e., 2010 represents 2009/2010 harvest season)

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Although SA could increase soy production by rotating land with maize, this will be capped as maize is a critical staple crop

	Current Situation	Current Capacity	Key Players
Land	• Dominated by commercial farmers • Mostly in the Northeast • 312K ha planted with soy	• 2.3 M ha are suitable for soy, but must compete with maize planting which will likely dominate	• 99% Commercial • Smallholders
Agronomic practices	• Most commercial farmers employ good agronomic practices • Only 15% employ crop rotation with soy	• Increased crop rotation (with maize and soy) would increase the volume of soy produced	• Government Extension Services • NGOs
Competing crops	• Maize is the main competitor; however, maize prices have decreased recently due to maize surpluses • Farmers usually plant 80% maize • Crop rotation improves maize yield by 10%	• Competition for maize reduces total potential land for soy • Demand for maize is about 9m MT	• N/A
Level of mechanization	• Complete in commercial sector • Low mechanization for smallholders	• Limited availability of mechanical equipment • Must be imported	• AFGRI

Source: TechnoServe Interviews, November 2010

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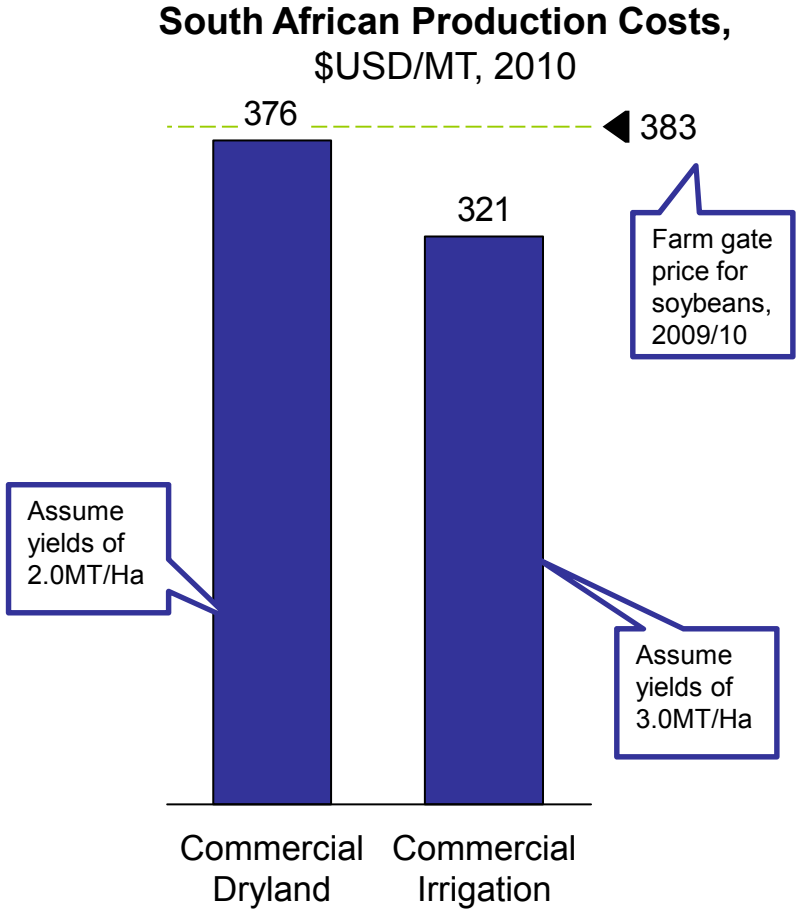
Soy is profitable for irrigated production, but only marginal for dryland production



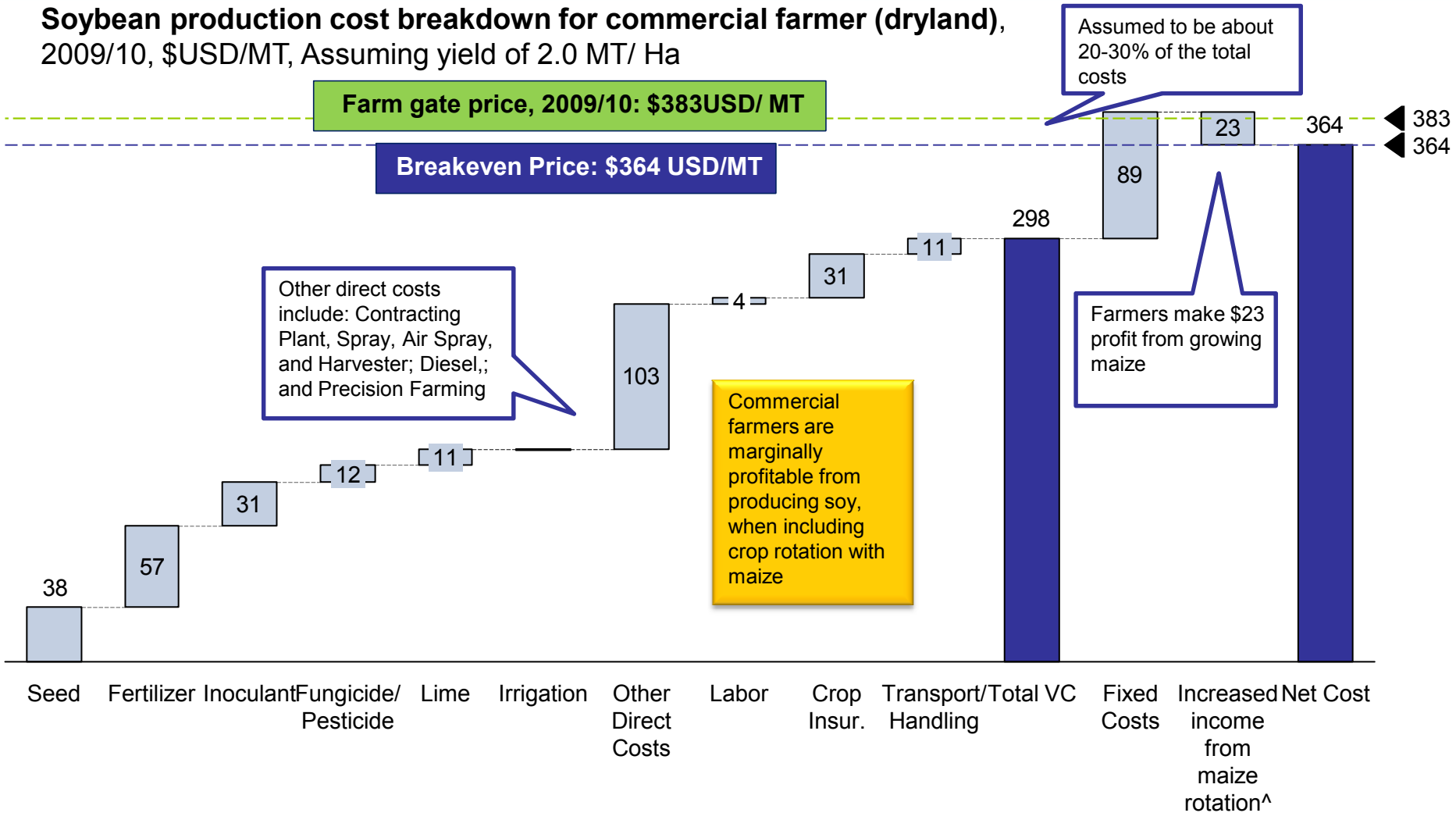
Production Cost Summary

- Yields range from 1.5 MT/Ha to 3.0 MT/Ha depending on the province
- Costs are lower than import parity ($537 for 2010), indicating that domestic production of soybeans is competitive with imported soybeans
- While commercial farmers producing soy on dryland receive a marginal profit, farmers employing irrigation can see a more substantial profit
- Generally, soy production takes more inputs and production costs in South Africa due to poor agroclimatic conditions compared to other countries in the region

Source: TechnoServe Interviews, January 2011; TechnoServe Analysis

Commercial production costs on dryland are $364 USD/MT, assuming a 2.0 MT/Ha yield

Soybean production cost breakdown for commercial farmer (dryland), 2009/10, $USD/MT, Assuming yield of 2.0 MT/ Ha



Source: TechnoServe Interviews, January 2011; TechnoServe Analysis; Grain SA/ Graan SA (maize yields); Mongabay.com (prices); ^Assumes 4.5 t/ha yield without crop rotation and 5.0 t/ha with crop rotation, ½ ha converted to soy from maize, a maize price of $234, and a 10% profit margin;

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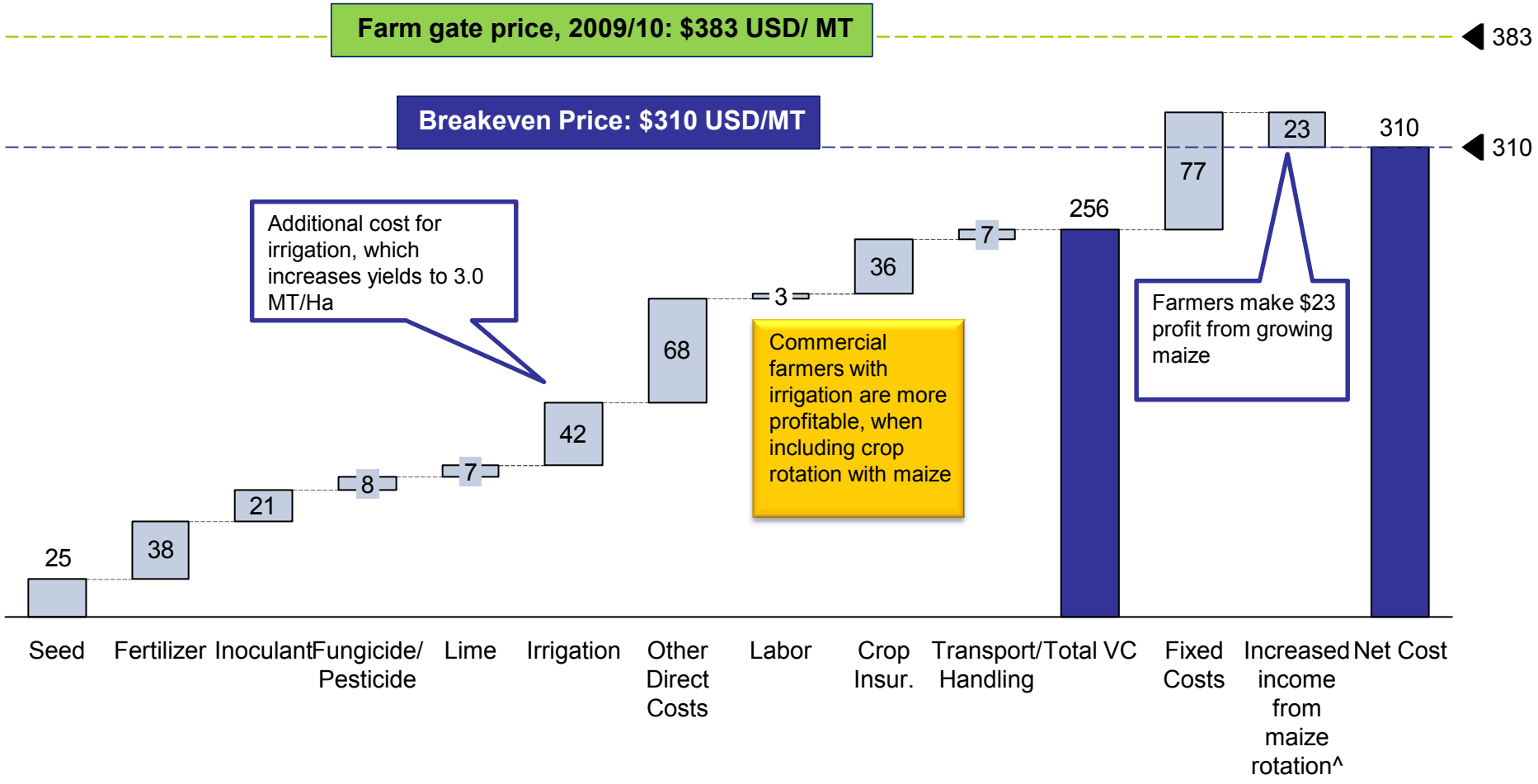
Commercial production costs with irrigation are $310 USD/MT, assuming a 3.0 MT/Ha yield

Soybean production cost breakdown for commercial farmer (irrigation), 2009/10, $USD/MT, Assuming yield of 3.0 MT/ Ha



Source: TechnoServe Interviews, January 2011; TechnoServe Analysis; Grain SA/ Graan SA (maize yields); Mongabay.com (prices); ^Assumes 4.5 t/ha yield without crop rotation and 5.0 t/ha with crop rotation, ½ ha converted to soy from maize, a maize price of $234, and a 10% profit margin

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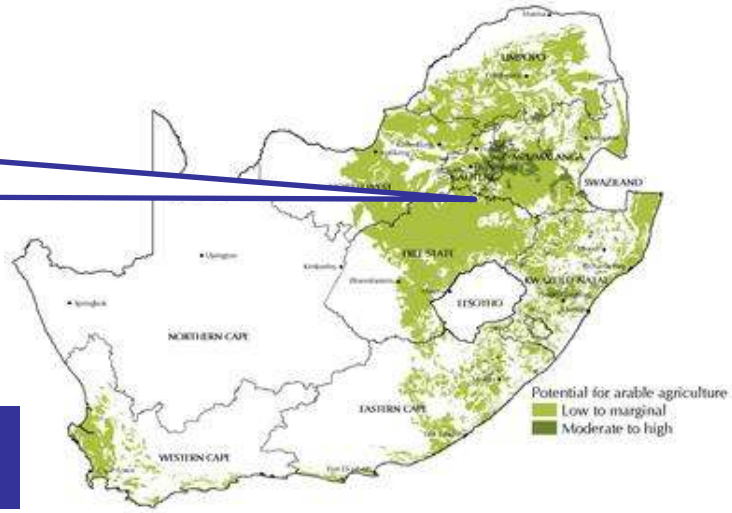
2.6m Ha in South Africa are agronomically suited for growing soy; however, only 874k ha could be realistically planted with soy on dryland

2.6m Ha of land area is suitable for growing soy (both dryland and irrigation); however, most of this land is already being used for maize, soy, and other crops



Hectares of available for dryland soybean production in summer rainfall area

Province	Total Ha available	% for soybeans	Ha available for soy
Mpumalanga	742k	50%	371k
KwaZulu-Natal	114k	50%	47k
E. Free State (planting wheat)	828k	25%	207k
E. Free State (not planting wheat)	316k	50%	158k
Gauteng	163k	50%	81k
Total	**2,163k**		**874k**

874k Ha of land are available for dryland soybean production when considering rotation with other crops, mainly maize and wheat

Any additional land for soy, will likely be taken away from maize

Source: TechnoServe Interviews, January 2011; "The development of a map showing the soybean production regions and surface areas of the RSA," Chris Blignaut, Michael Taute, 2010; GrainSA/Graan SA

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Processing

South Africa Oil Refinery; *Times Magazine*

Processors have to choose between soy, which is better for cake, and sunflower, which is better for oil

Processors often make decisions whether to process sunflower seeds or soybeans and must weight the costs and benefits of both

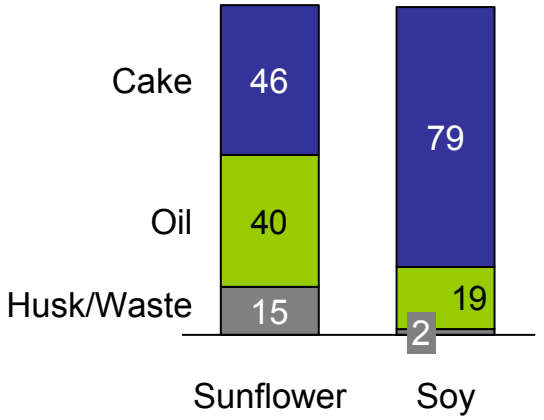
SUNFLOWER

- **Demand for sunflower oil is high**; most consumers prefer sunflower oil for cooking
- Sunflower cake is viewed as inferior to soy cake due to its fibrous nature and lack of protein comparative to soy; sunflower cake is primarily used in dairy/beef and with other ruminants such as goats and sheep
- For a given ton of oilseed, **sunflower produces more than twice the amount of oil as soy**, which is sold at higher prices than soy oil; however, its cake price is cheaper
- **Sunflower husk is also used** as a source of **fuel** for processing plants

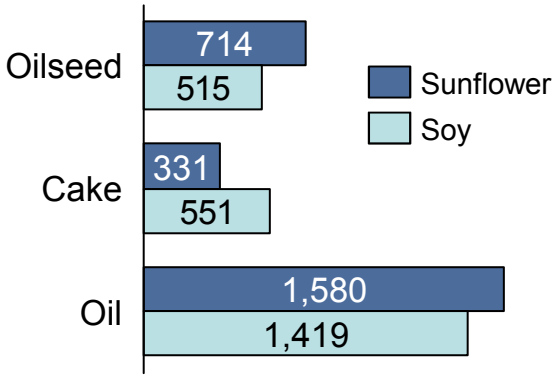
SOY

- **Demand for soy cake is high**; mainly for the feed industry, in particular poultry and pork
- **Soy cake is preferred over sunflower cake** despite being more expensive; sunflower cake are too fibrous, so very little is used in poultry or pig feed
- For a given ton of oilseed, **soy yields almost double the amount of cake as sunflower**, which is sold at higher prices than sunflower cake
- **Quality of soy cake has been reported as an issue** due to inconsistency of the protein content

Percentage Breakdown of Oilseed Products, %



Relative Price of Oilseed Products, $USD/MT[1]



Source: TechnoServe Interviews, January 2011; ITC

[1] Prices are all reflective of 11 November 2010; GrainSA/ GraanSA

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Sunflower is currently the oilseed of choice for processors due to backward integration with refineries

Oilseed Processing

- Oilseeds can either be processed domestically or crude oil can be imported
- Decisions are made based on the following factors:
  - Exchange rate
  - Availability and price of domestic sunflower/soy
  - Availability and price of international sunflower/soy
  - Availability and price of international crude vegetable oil
  - Availability and price of refined oil (sunflower/soy/cooking)

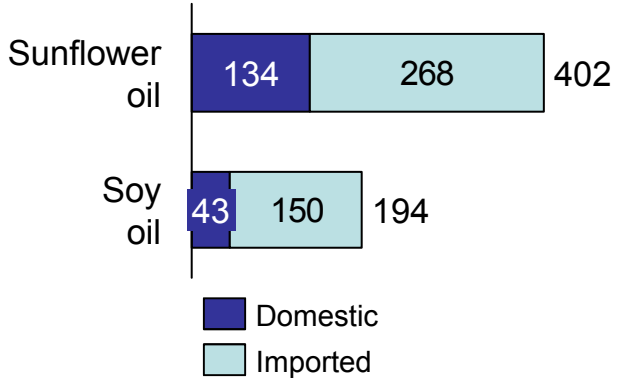
Oil Refinery

- Refiners make refining decisions based on consumer preferences
- Refiners' goals are to have a 90-100% utilization of their refineries to maximize their profitability for refined oil
- Many refiners would rather halt processing than have their refineries run below full utilization

Consumer Demand

- Consumers prefer sunflower oil due to its taste and better nutritional value
- Most soy oil is found within cooking oil blends (usually blended with sunflower oil)

Oil Consumption by Source, 2010, '000 MT



As refiners integrate backwards, their processing decisions are based on consumer preferences for sunflower oil

Source: TechnoServe Interviews, January 2011; BFAP, 2010

While there is sufficient processing capacity, with additional coming online, utilization for soy processing is quite low

Type	Key Players/ Locations	Current Capacity (MT)*	Est. Additional Capacity (MT)	Total Capacity (MT)
Dual processing plants (sunflower/ soy)	• **Key Players**: Willowton, Epko, and Conti-Oil • **Locations**: Pietermaritzburg, Gauteng, Cape Town, Lichtenburg, Randfontein	1,100k	1,100k (two plants)	2,200k
Full fat soy processing	• **Key Players**: Majesty Oil, Meadows, Prodsure, Afgri Foods, Sovereign Foods Rockland, Winterton Agricultural Distributors	530k	33k	563k
Soy oilcake processing	• **Key Players**: Majesty Oil, Nedan Oils, Gauteng Oils, Specialized Protein Products • **Locations**: Krugersdorp, Potgietersrus, Gauteng, Potchefstroom	238k	200k	438k
Total Capacity		**1,534k****	**1,333k**	**3,251k**

Current utilization is estimated at ~540k MT of soybean input, which is only **29% of the total processing capacity** available

Additional capacity should come by 2011/12

Source: TNS Interviews January 2011; NAMC Analysis; * Capacity numbers are still being confirmed during the date of this study, January 2011; ** Through the process of investigating the market, several smaller plants focused on human consumption (soy flakes,TSP, etc.) also exist, but have small processing capacities and are nascent

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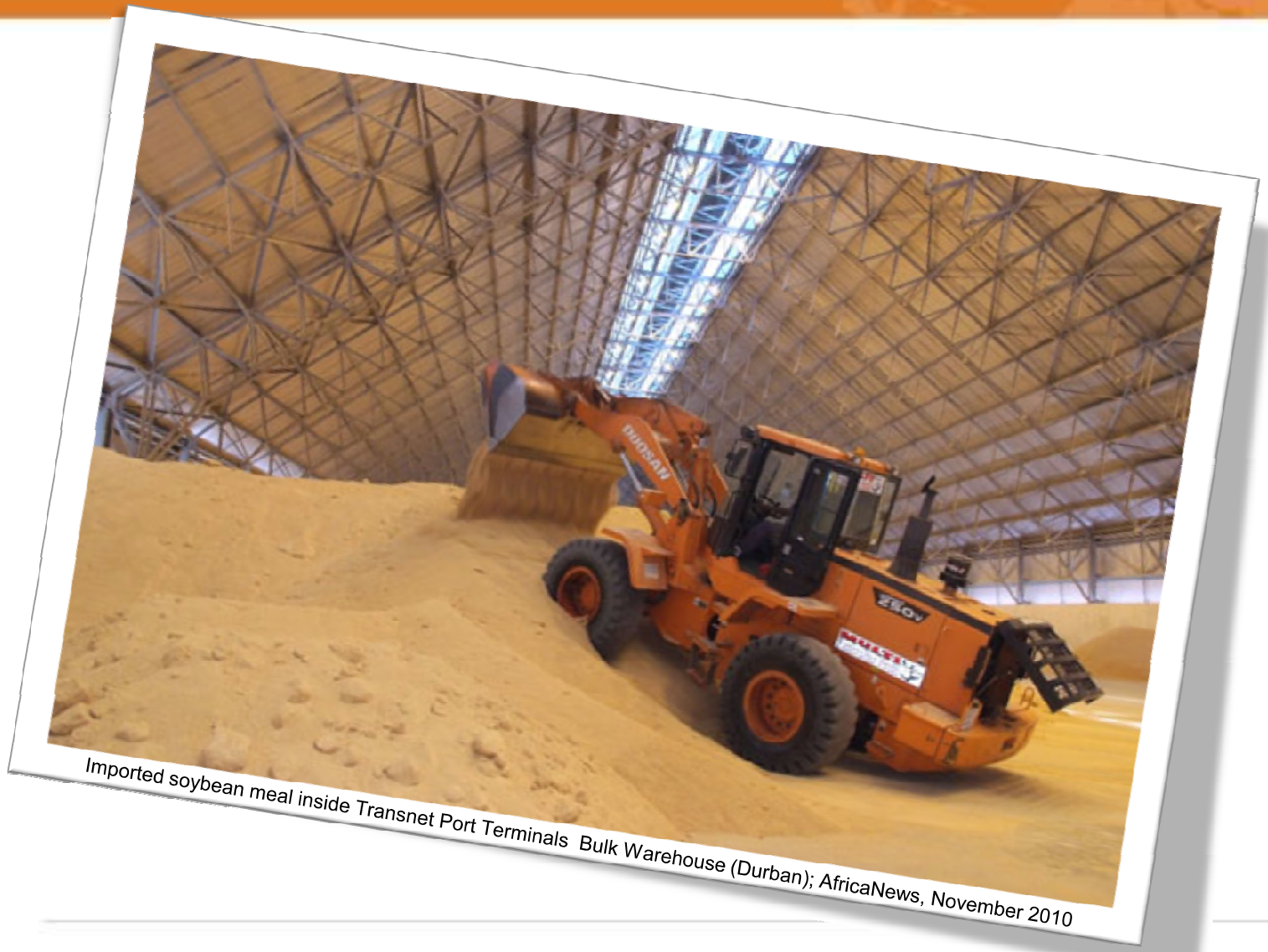
Demand



Imported soybean meal inside Transnet Port Terminals Bulk Warehouse (Durban); AfricaNews, November 2010

Simplistically, there are three main ways that soy beans can be used in South Africa

Processed for full fat cake

- The bean is crushed to produce a cake that retains all of the oil
- Typically used for finisher feed or to mix with low fat cake to produce a more balanced meal
- 1 MT of bean produces ~1MT of full fat cake
- Thus, demand for 1MT of full fat cake is **equivalent to 1 MT of soy beans**

+

Processed for human solid consumption

- The bean is processed to produce soy chunks or other food
- Also includes processing for soy milk
- Assume that all of the beans are used up (there is some waste, but not a significant amount)
- Thus, demand for 1MT of human solid consumption is **equivalent to 1 MT of soy beans**

+

Processed into cake or oil

- The bean is processed (using solvent or mechanical extraction) to extract the oil and produce low fat cake in either **soy only** or **dual extraction** plants (which can process either soy or sunflower)
- 1MT of beans typically produces ~0.18 MT of oil and 0.8 MT of cake
- Thus, demand for 1MT of soy oil is **equivalent to 5.56 MT of soy beans** and demand for 1 MT of soy cake is **equivalent to 1.25 MT of soy beans**
- **It is not possible to produce one without the other, forcing processors to be able to find a market for both products**

The SA soy market has grown due to increases in soy cake, full fat, human-consumed soy, and soy oil demand

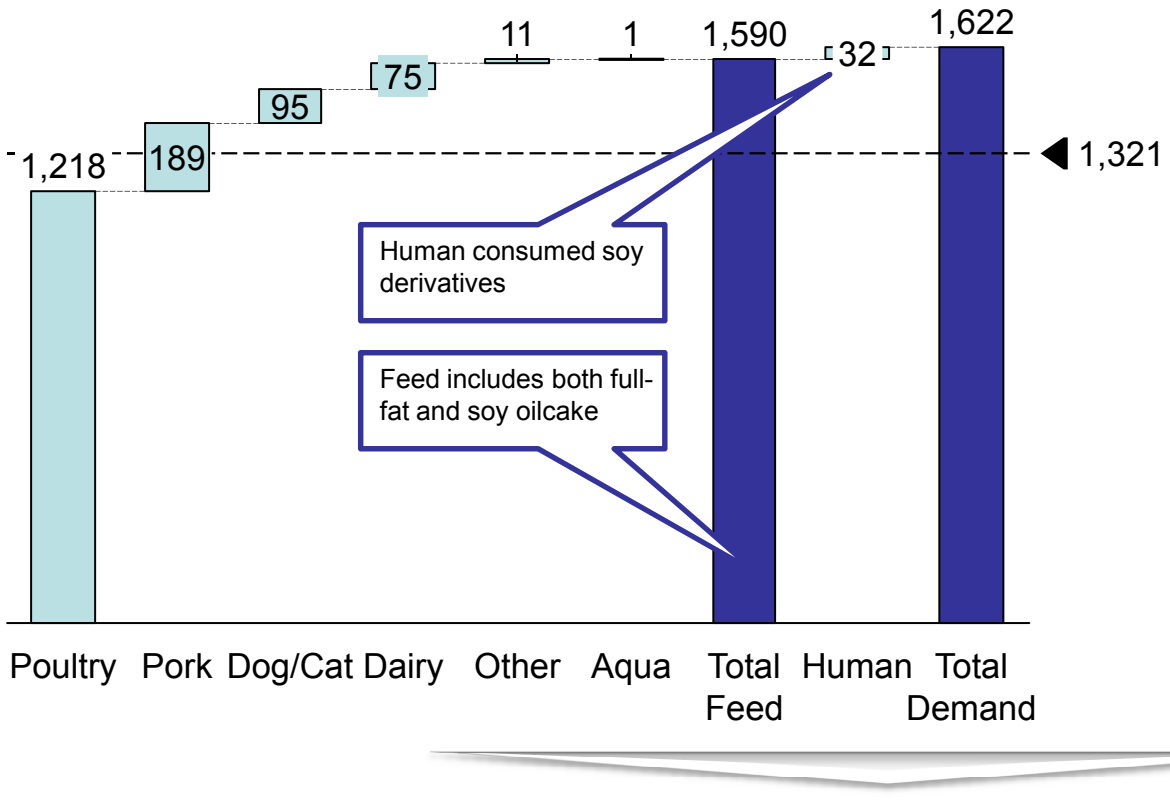
Soy cake	• Soy cake demand is driven by the poultry industry
	• Soy cake is imported, mainly from Argentina due to a lack of supply, as well as reported inconsistencies in protein content of the local supply of cake
	• Potential substitute products for soy cake are sunflower cake
	• While sunflower cake is cheaper per unit of protein, it is not a direct substitute
	  ○ Sunflower cake are too fibrous, so very little is used in poultry or pig feed
	  ○ However, sunflower cake is used for cattle feed

Full fat soy	• Most full fat soy is produced locally by feed manufacturers out of necessity for soy inputs • Growth in the feed industries (especially poultry) stimulate this demand
Human-consumed soy	• Soy consumed by humans is increasing due to the nutritional nature of soy as well as the growth of niche health and allergy industries, yet it still has not been widely accepted • Soy is also being introduced to smallholder farmers through WISHH and other programs whose aim is to provide nutritional education and increase food security
Soy oil	• The sunflower oil market is large, while the soy oil market lags, but is mainly sourced from imports • The South African consumer market generally prefers sunflower oil; soy oil is usually used for cooking oil blends • Refineries also focus on sunflower oil rather than soy oil due to its preference in the market, which affects oilseed processing decisions • Use of oilseeds for biofuels as part of SA's Biofuel Industry Strategy also increases demand for soy and sunflower, but biodiesels is still a small market currently

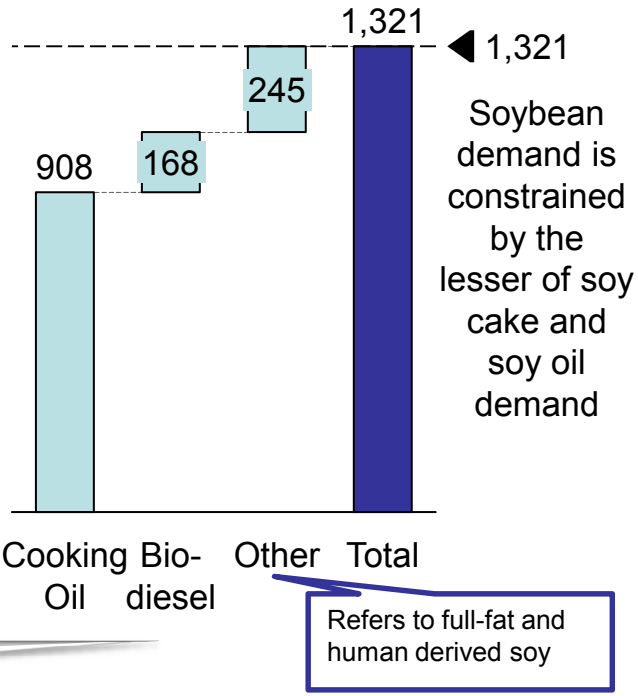
Source: TechnoServe Interviews, January 2011

The soy market is driven primarily by demand for soybean oil and secondarily cake demand for poultry and pork feed

Soybean demand for soy cake[1]
2010, '000 MT soybean equivalent[2]



Soybean demand for soy oil
2010, '000 MT soybean equivalent[2]



Soybean demand is constrained by the lesser of soy cake and soy oil demand

There is demand for 1.3m MT of soybeans in South Africa today driven by soy oil demand from cooking oil and bio-diesel

Source: Protein Research Foundation, [1]Projected ratio by industry from 2007 statistics; [2]Soybean equivalent is the amount of soybeans it takes to produce soy oil or cake (0.18 and 0.8 MT soybeans to produce of 1MT of soy oil and soy cake, respectively)

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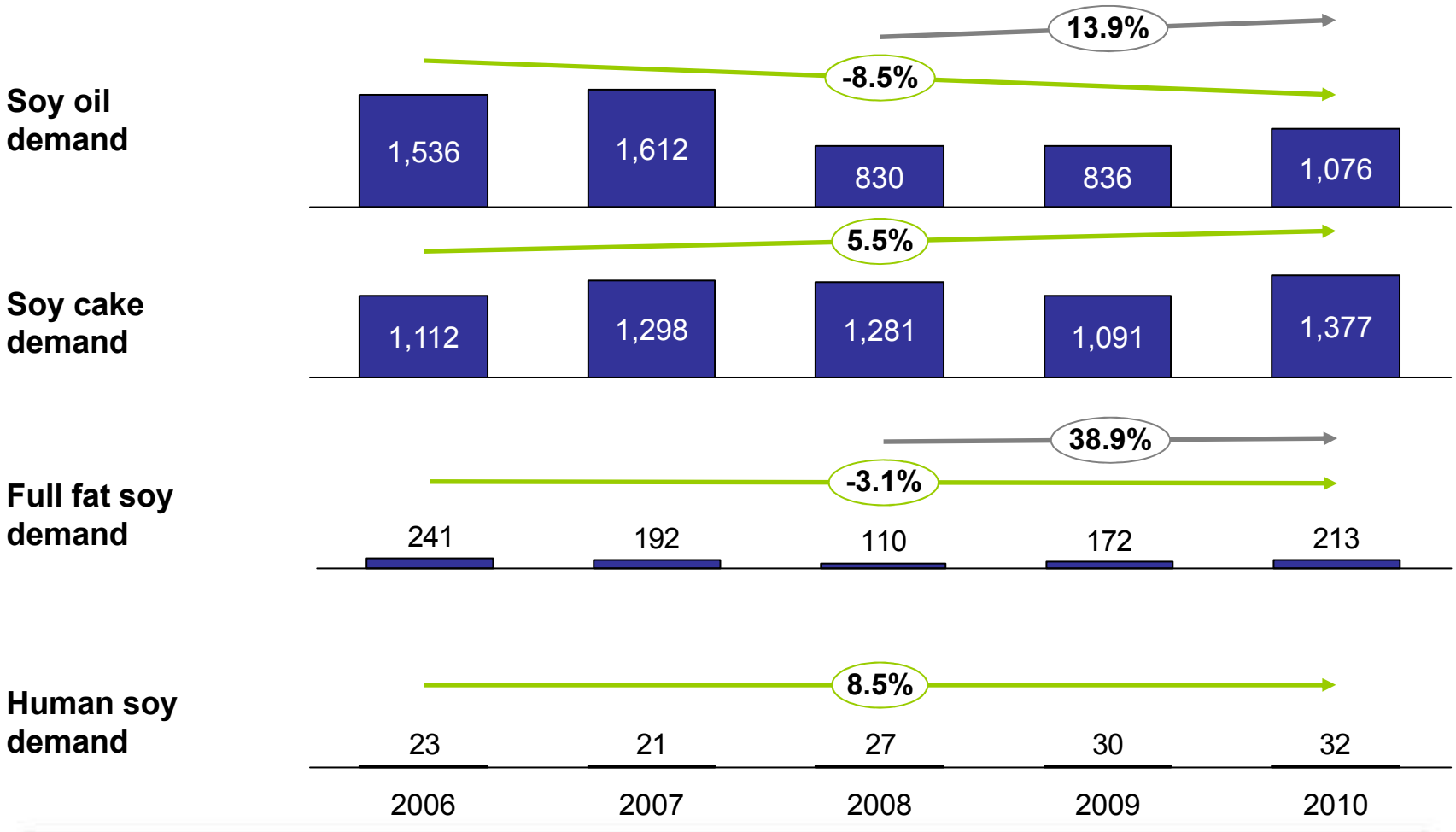
The South Africa market for soy products has increased over the past five years, mainly driven by soy cake growth

Historical demand for soy products,
2006-2010, '000 MT soybean equivalent[1]



Source: BFAP 2010; SAGIS

[1]Soybean equivalent is the amount of soybeans it takes to produce soy oil or cake (0.18 and 0.8 MT soybeans to produce of 1MT of soy oil and soy cake, respectively)

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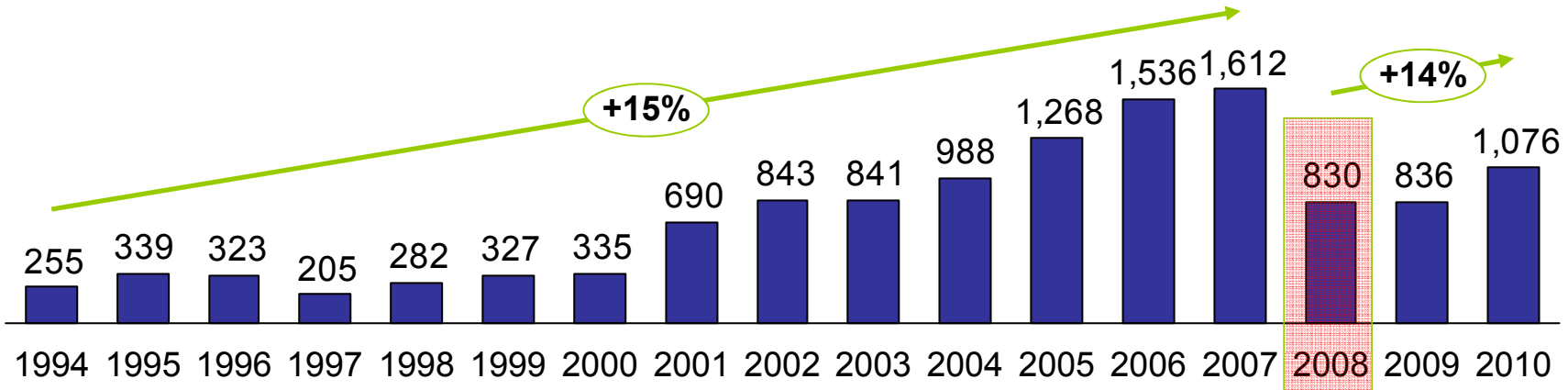
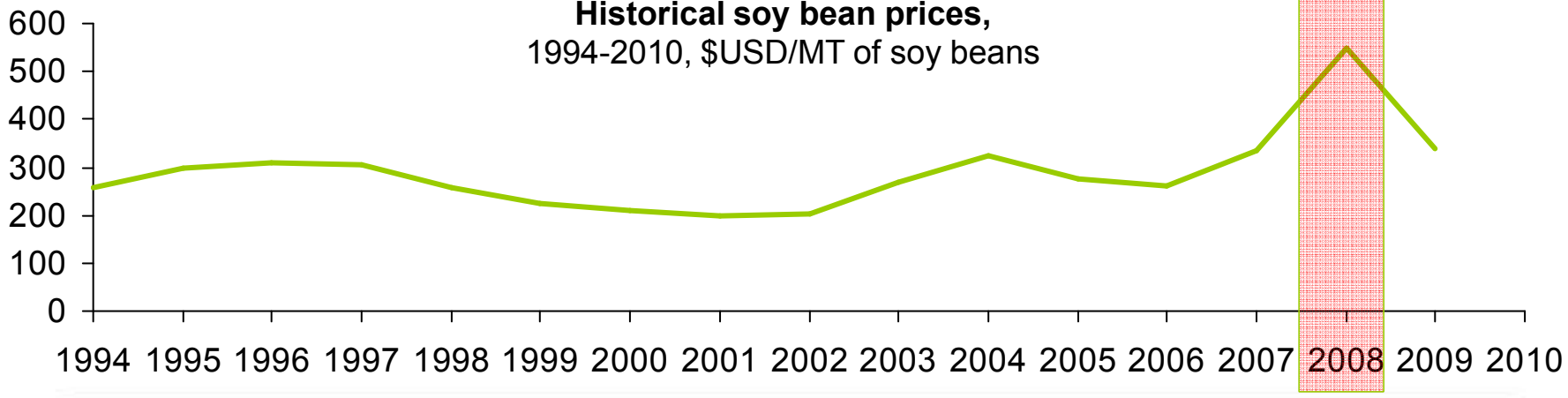
Soy oil demand has increased by 15% p.a.; despite a decline in 2008 due to high soy prices, the market is rebounding

Historical demand for soy oil,
1994-2010, '000 MT soybean equivalent[1]



Historical soy bean prices,
1994-2010, $USD/MT of soy beans



TNS/NAMC Analysis
[1]Soybean equivalent is the amount of soybeans it takes to produce soy oil or cake (0.18 and 0.8 MT soybeans to produce of 1MT of soy oil and soy cake, respectively)

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Based on historical demand increases and stakeholder interviews, assumptions for growth are as follows

Underlying Assumptions

- Historical demand is a sound indicator of future growth in each of the soy products
- Soy cake and full fat demand may actually be even greater due to increases in income triggering an increase in meat consumption and therefore cake for animal feed
- Soy oil demand may also be greater due to increased use of oilseeds (including soy) for bio-diesel
- Full fat soy demand is assumed to be consistent with soy cake demand historical increases

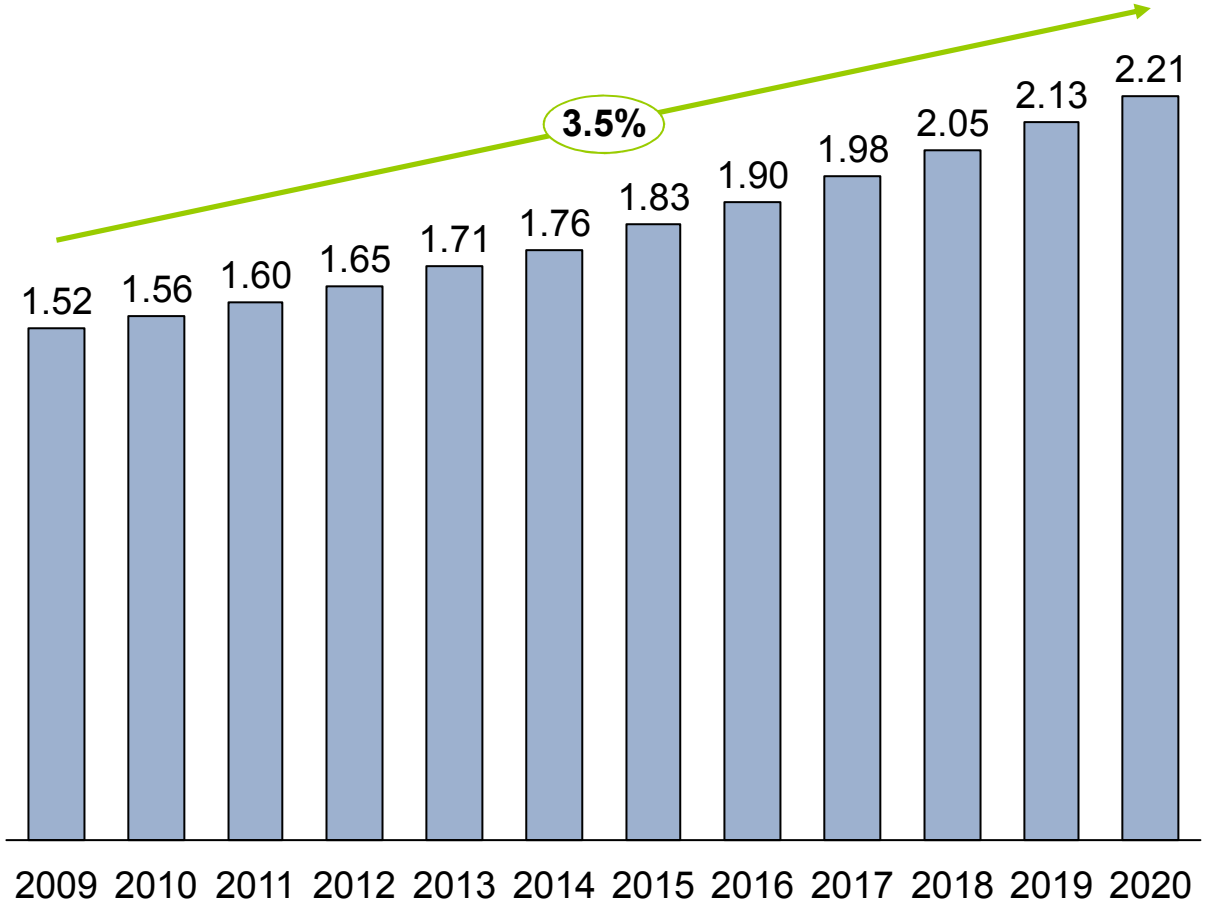
	Estimated change in demand 2010 – 2015 %, p.a.
Soy oil demand	13.9%
Soy cake demand	5.5%
Full fat soy demand	5.5%
Human soy demand	8.5%

Source: Protein Research Foundation, TechnoServe/ NAMC Analysis

The poultry industry will grow rapidly as consumption rises with income

- The industry will primarily be driven by higher disposable incomes with **per capita GDP expected to rise by 3.0% p.a.**
- Demand will also be driven by **population growth of 1.3% p.a.**
- Poultry industry is **projected to continue increasing, estimated at 3.5-6% p.a.,** which is conservative
- Other estimates project a that poultry production and consumption growth will both increase by 31% and 25% respectively to 2013/14, owing to increased demand from higher incomes and an increasing prevalence of fast food restaurants
- Changes in the poultry industry practices could change this projection

Projected poultry consumption
2009-2020, million MT



Source: BFAP; TechnoServe Analysis; South Africa Agribusiness Report Q3 2010" from Business Monitor International

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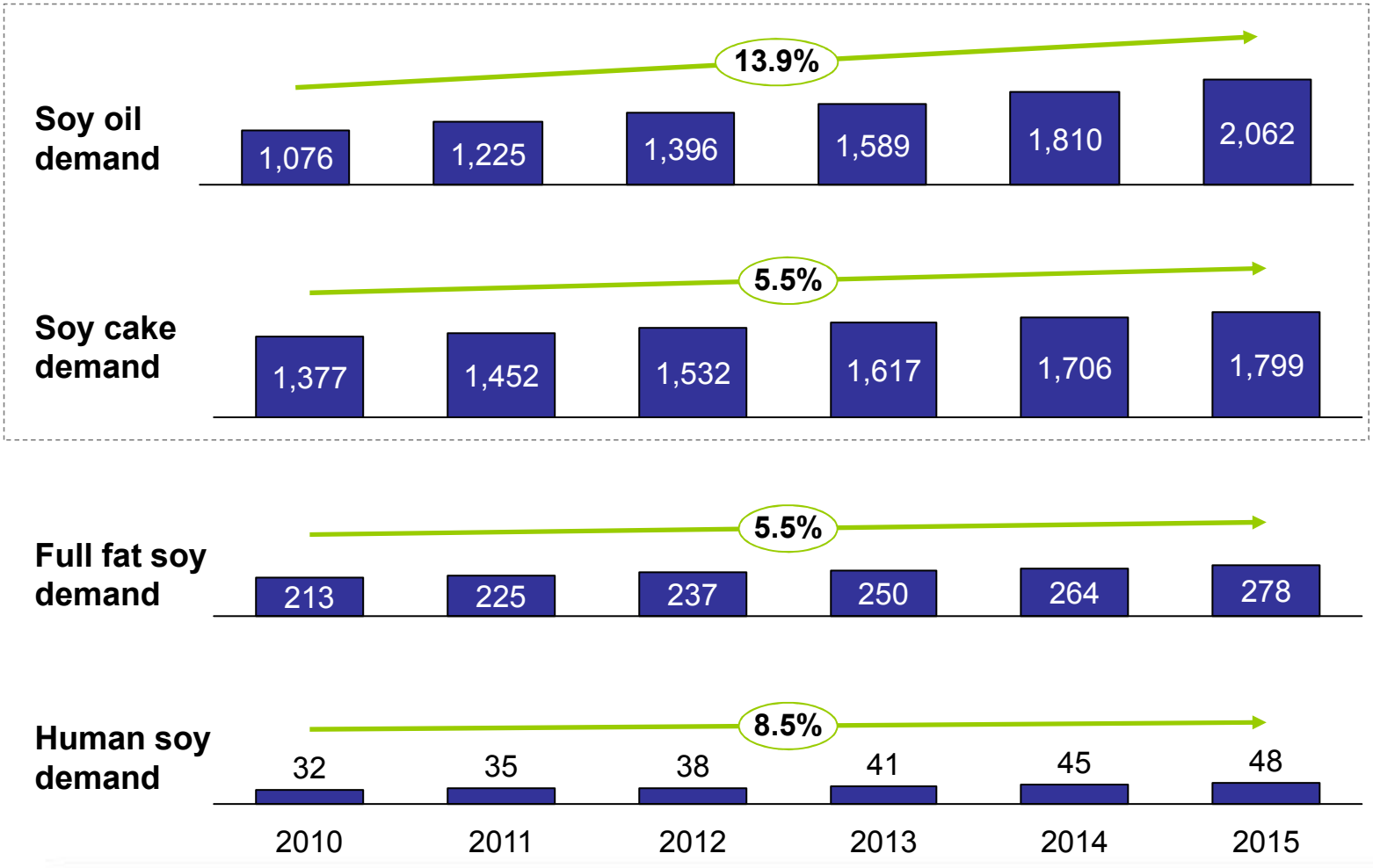
Based on these growth rates, demand for soybeans is projected to increase to 2M MT for oil and 1.8M MT for cake

Projected demand for soy products, 2010-2015, '000 MT soybean equivalent[1]



~18% and ~80% of a soybean are used to make soyoil and soy cake

Source: TechnoServe/NAMC Analysis

[1]Soybean equivalent is the amount of soybeans it takes to produce soy oil or cake (0.18 and 0.8 MT soybeans to produce of 1MT of soy oil and soy cake, respectively)

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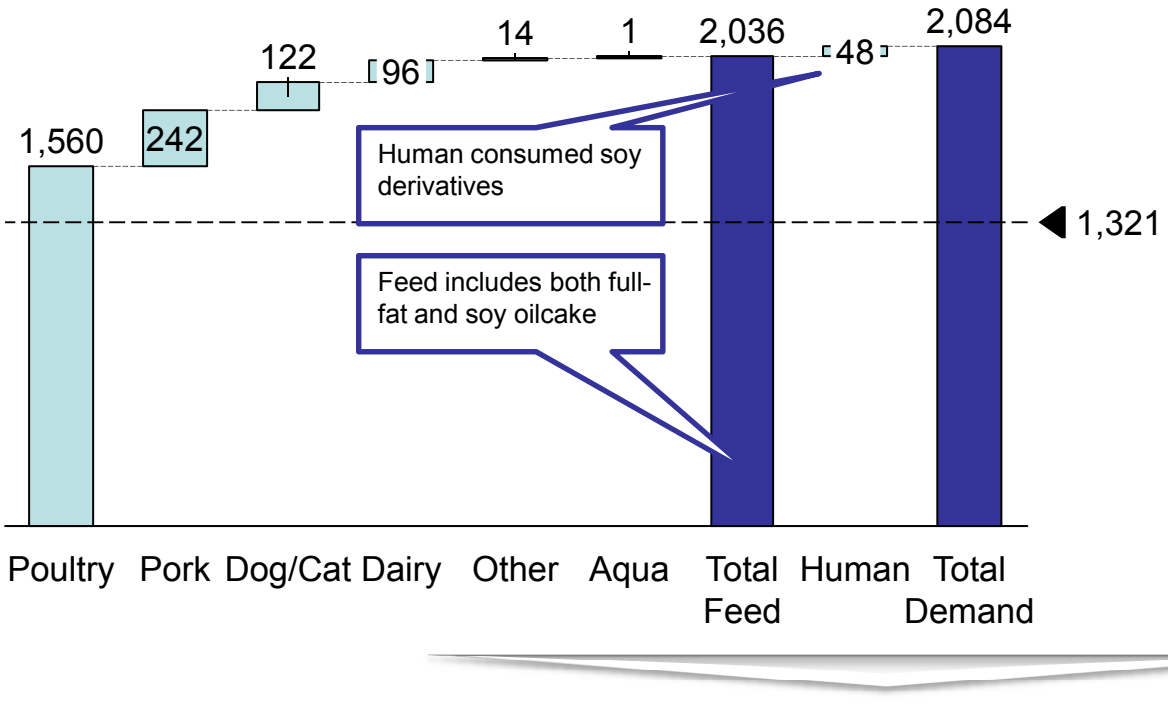
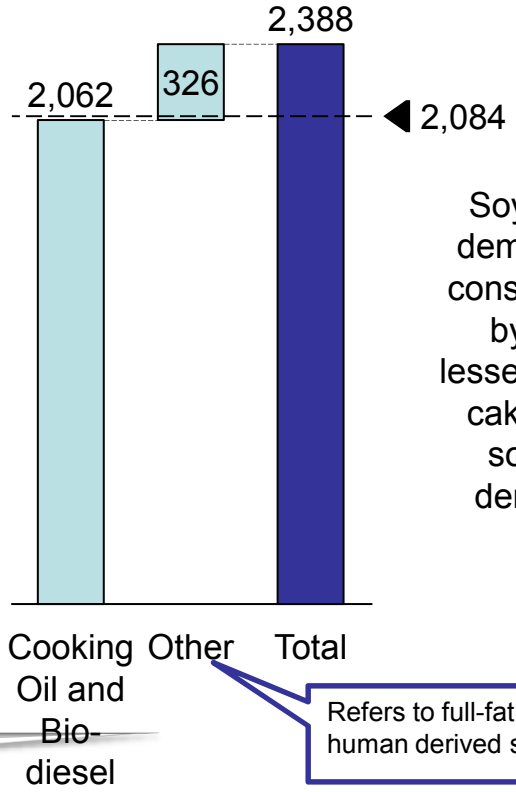
In 2015, soybean demand is projected to be 2m MT of soybeans, constrained by demand for soy cake

Soybean demand for soy cake[1]
2015, '000 MT soybean equivalent[2]



Soybean demand for soy oil
2015, '000 MT soybean equivalent[2]



Soybean demand is constrained by the lesser of soy cake and soy oil demand

In 2015, there is a projected demand for 2m MT of soybeans in South Africa constrained by demand for soy cake

Source: Protein Research Foundation, [1]Projected ratio by industry from 2007 statistics; [2]Soybean equivalent is the amount of soybeans it takes to produce soy oil or cake (0.18 and 0.8 MT soybeans to produce of 1MT of soy oil and soy cake, respectively)

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Enabling Environment and Infrastructure

Transnet Port Terminals Bulk Warehouse in Durban; AfricaNews, November 2010

Cape Town port with boats; Ken Sorrie/iStockphoto

Key policies have shifted toward a deregulation of agricultural products, yet tariffs exist for soy imports

Main Agricultural Policies	• Deregulation of the marketing of agricultural products • Changes in the fiscal treatment of agriculture, including the abolition of certain tax concessions that favored the sector • A reduction in direct budgetary expenditure on the sector • Trade policy reform, which included the application of tariffs on farm commodities and a general liberalization of agricultural trade including free trade agreements • Institutional reform influencing the governance of agriculture • The application of labor legislation to the agricultural sector
Soy Product Tariffs	• An **8% import tariff** exists for the import of all soy products • The African Feed Manufacturers Association (AFMA) petitioned International Trade Administration Commission (ITAC) to reduce the import tariff to encourage cheaper imports of soy cake into South Africa; ITAC rejected the petition to do more research to see the impact of this import tariff change on the domestic soy industry • ITAC did approve the **8% import tariff rebate for soybean imports for biodiesel production** (submitted by SASOL), but only for three years, which **expires June 2011**; this rebate was never used

Source: DAFF, Strategic Plan for South African Agriculture; TechnoServe Interviews, January 2011

South Africa's Land Reform process is still ongoing with little improvements seen, especially for black South Africans

The **Native Lands Act of 1913** "prohibited the establishment of new farming operations, sharecropping or cash rentals by blacks outside of the reserves" where they were forced to live

After independence in 1994, the Native Lands Act of 1913 was changed and the **Land Reform Process** took place with a focus on the following:

LAND RESTITUTION

- Government compensated (monetarily) individuals who had been forcefully removed
- This has been very unsuccessful and the policy has now shifted to redistribution with secure land tenure

LAND TENURE REFORM

- System of recognizing people's right to own land and therefore control of the land
- This has been difficult to implement and has been evolving throughout the years

LAND REDISTRIBUTION

- Originally, land was bought from its owners (willing seller) by the government (willing buyer) and redistributed; yet this proved difficult to implement
- In 2000, the process was changed to a more decentralized and area based planning process to encourage community participation, yet there have been challenges including the use of third parties
- In 2006, it was announced that government will start expropriating land with compensation to those whose land is expropriated
- Black South Africans still are dispossessed of land and many are homeless

Source: Deininger, Klaus. "Making Negotiated Land Reform Work: Initial Experience from Colombia, Brazil and South Africa." World Development Vol. 27(1999): 651-672

Land reform programs and the GMO Act impact the future of soy within South Africa as well as regional trade

Key Policy	Description	Impact on Soy
Land Reform Programs	• Land reform programs consist of restitution, redistribution, and tenure reforms • Reforms have evolved over the years and are still ongoing	• Land redistribution could affect the land that is currently being used for soy and future land that is planted with soy • Land redistribution will also affect black smallholder farmers, who may become the recipients of this reform • As a result of the uncertainty of these programs, South Africa signed a deal with the Democratic Republic of Congo in 2009 that allows South African farmers to lease up to 10-million hectares of land in the DRC for the production of maize, soy beans, poultry, dairy cattle and other produce
GMO Act 1997	• Allowed the use of genetically modified (GM) soy seeds that are herbicide resistant • This act makes South Africa the only nation in the region allowing use of GM soybeans	• Allows for improved generically modified seeds that can aid in soy production and increased yields • However, neighboring countries do not allow the import of GM soybeans, which hinders South Africa's potential to export the raw beans (processed soy products made from GM soybeans are currently acceptable)

Source: DAFF, Strategic Plan for South African Agriculture; "South Africans to farm in Congo," *SouthAfrica.Info*, October 2009

Although biofuel projects are in the pipeline, many have not started to utilize soy for biodiesel

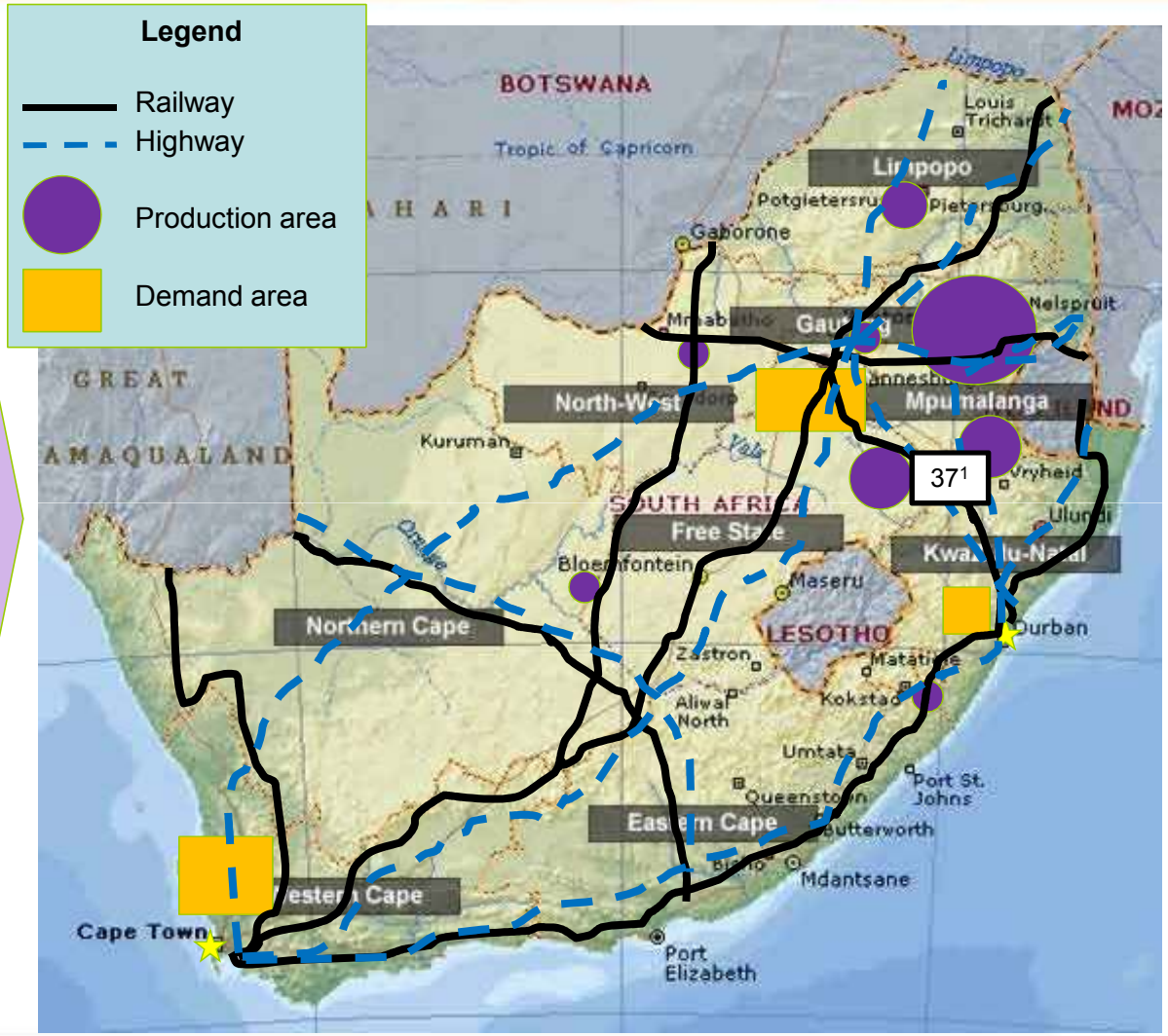
Key Policy	Description	Impact on Soy

Biofuel Industrial Strategy 2007	• Short term focus (five year pilot) to achieve a two per cent penetration level of biofuels in the national liquid fuel supply
	• Recommends sugar cane and sugar beet for bio-ethanol production and **soybeans**, canola and sunflower **as feedstock for biodiesel**
	• Exclusion of maize, despite its surplus, as feedstock for ethanol production has caused large debate
		• The soybean industry has huge potential for growth as feedstock for biodiesel, which would only exacerbate the gap between production and demand
		• **Rainbow Nation Renewable Fuels Limited (RNRF)** announced (in Aug 2010) a R1.5 billion ($0.18bn) biofuels processing plant in the Eastern Cape, which is expected to produce biodiesel and pharmaceutical glycerin from soybeans from South Africa and abroad
		  • The facility will consume 1.36 million tons of soybeans annually producing 288 million litres of biodiesel making it the largest soybean processing facility in Africa
		  • The investment will provide a significant boost to the Eastern Cape economy; the project is expected to generate R4.5 billion ($0.54bn) in revenue annually and create 350 new permanent jobs.
		  • An additional 725 employment opportunities in related sectors and 800 jobs during the construction phase are also expected to be created
		  • The due diligence on the project has been completed and the RNRF is awaiting potential investors before the project can continue

Source: South Africa Biofuels Annual Report, 2010

South Africa's interconnected road/rail network both domestically and with neighbors allows for easy transport

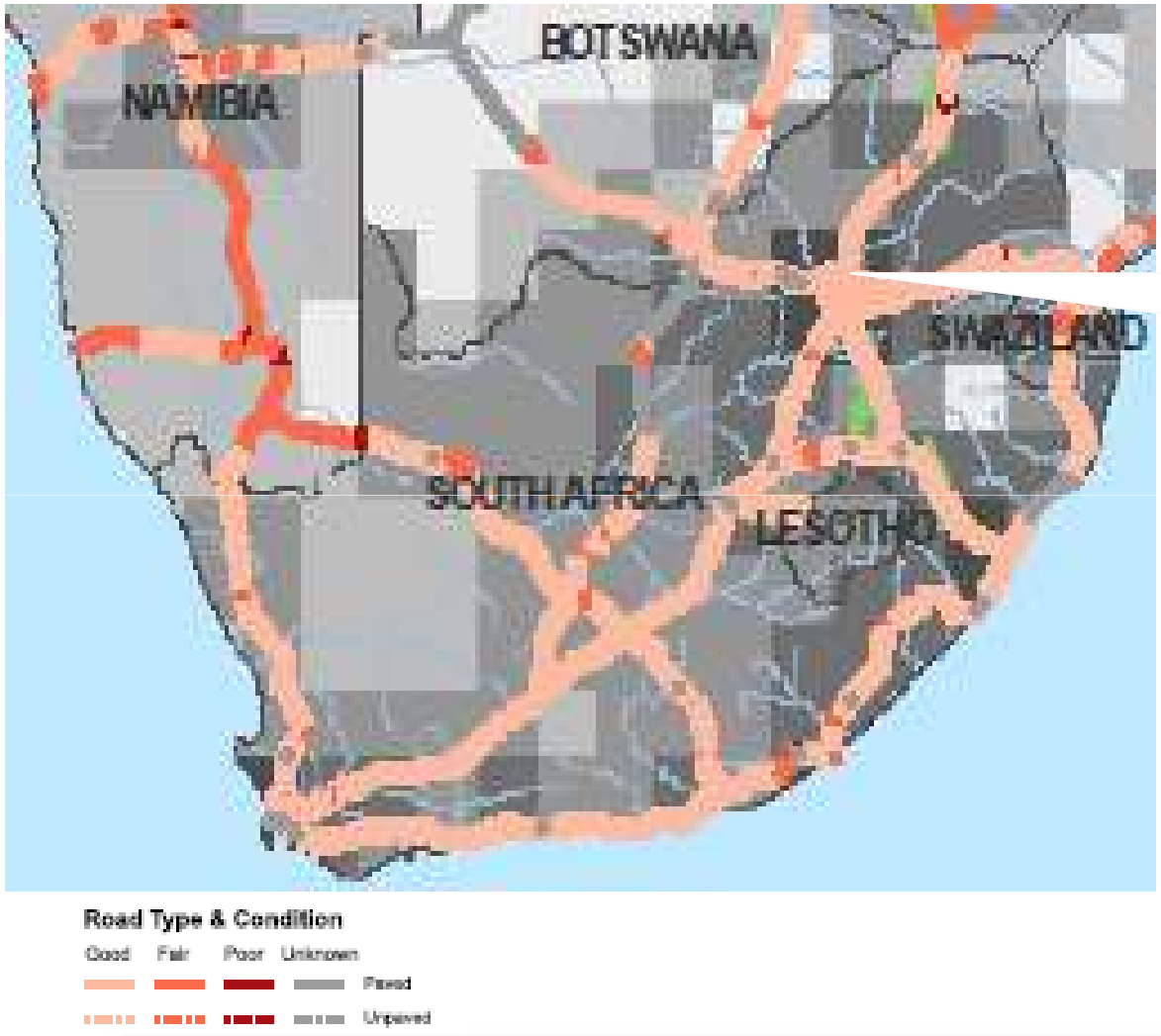
- Nearly all soy transport is done via road
  - Domestic transport is typically $0.065USD/MT/km
  - South Africa has a reliable highway system; major routes from ports to demand centers
- Road transport is extensive and connects South Africa to its neighboring countries within the region
- Good railway network exists within South Africa; however, it is not used as much due to unreliability
- Durban port is one of the largest ports in the region and is where major imports/exports originate/depart (both for South Africa and its neighboring countries)



Source: TNS Interviews, January 2011; NAMC Analysis;
[1] Assumes transport cost of R254 per MT from Durban to Randfontein for soymeal with an exchange rate of $1 USD = R6.88

$USD/MT X

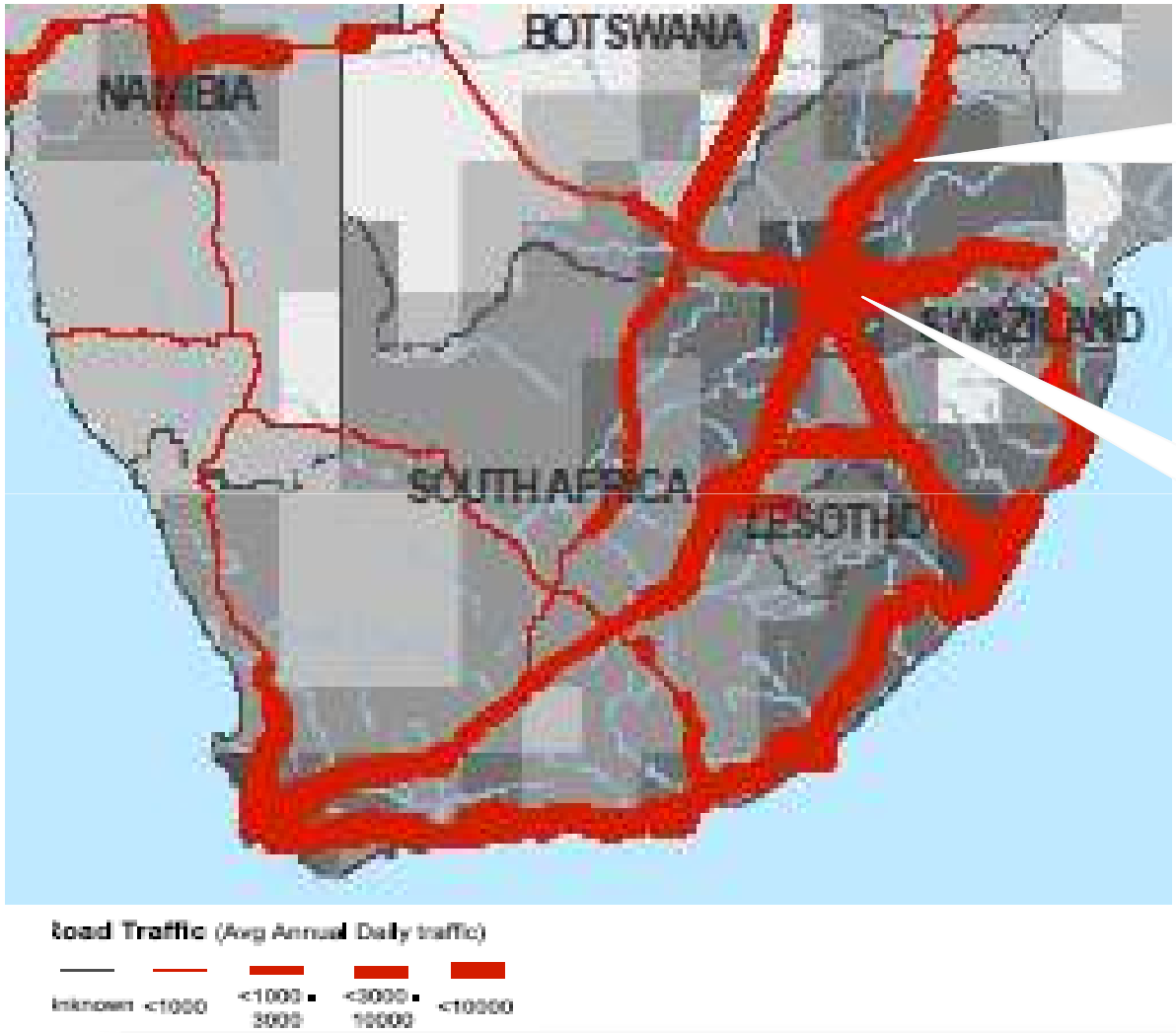
South Africa has very good road conditions as roads are used to connect Durban harbor with many neighboring countries



Road conditions are very good within South Africa, especially in comparison to road conditions in the rest of Africa

Source: AICD: SADC Infrastructure Regional Report, 2007

Road traffic is particularly concentrated around major cities and borders with South Africa's neighboring countries

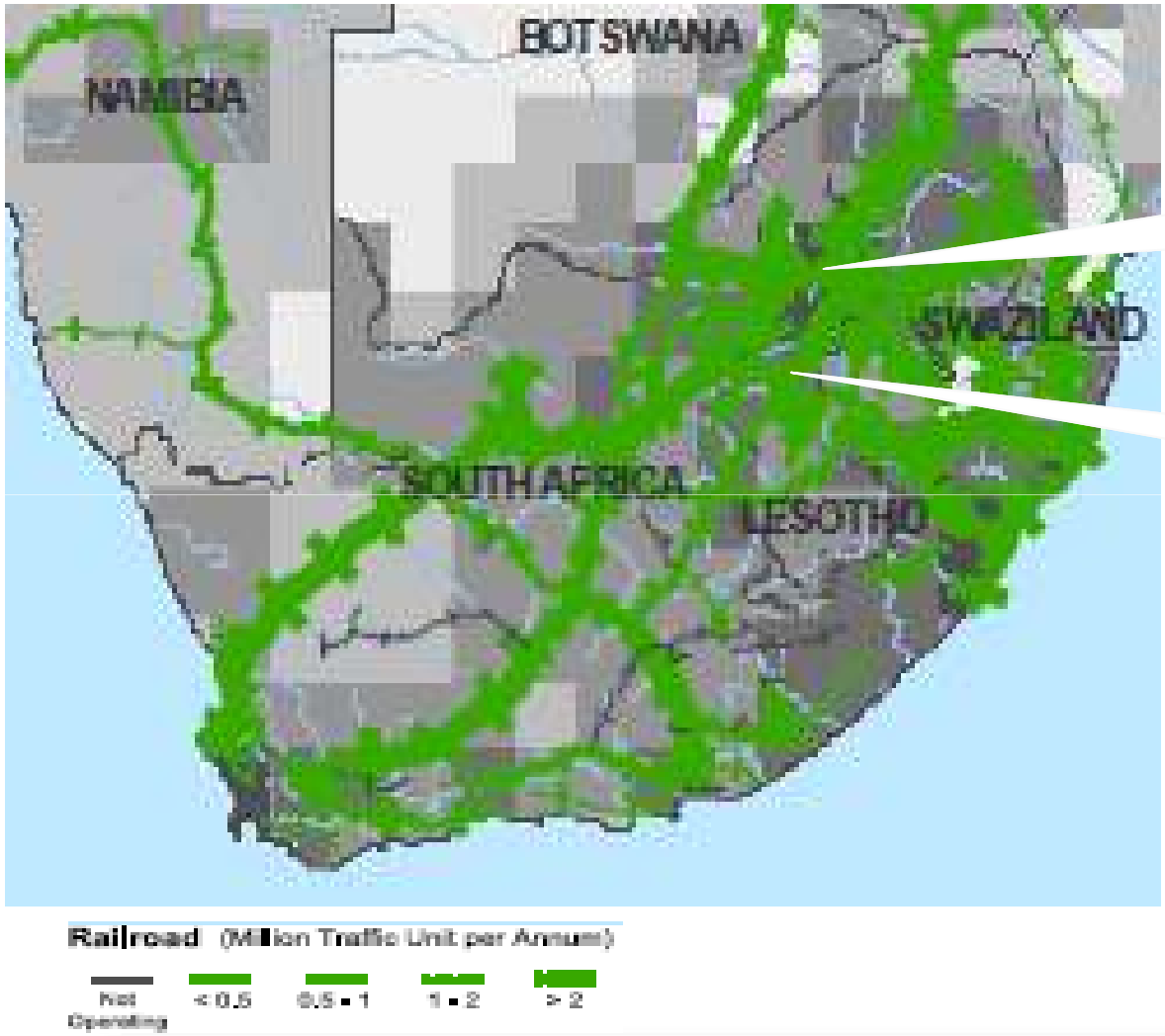


Road traffic is highly concentrated in the along the coast and borders to Swaziland, Lesotho, Mozambique, and Botswana

There is also high road traffic connecting major cities: Durban, Johannesburg, and Cape Town

Source: AICD: SADC Infrastructure Regional Report, 2007

South Africa has an extensive railroad network that connect major cities to ports and neighboring countries

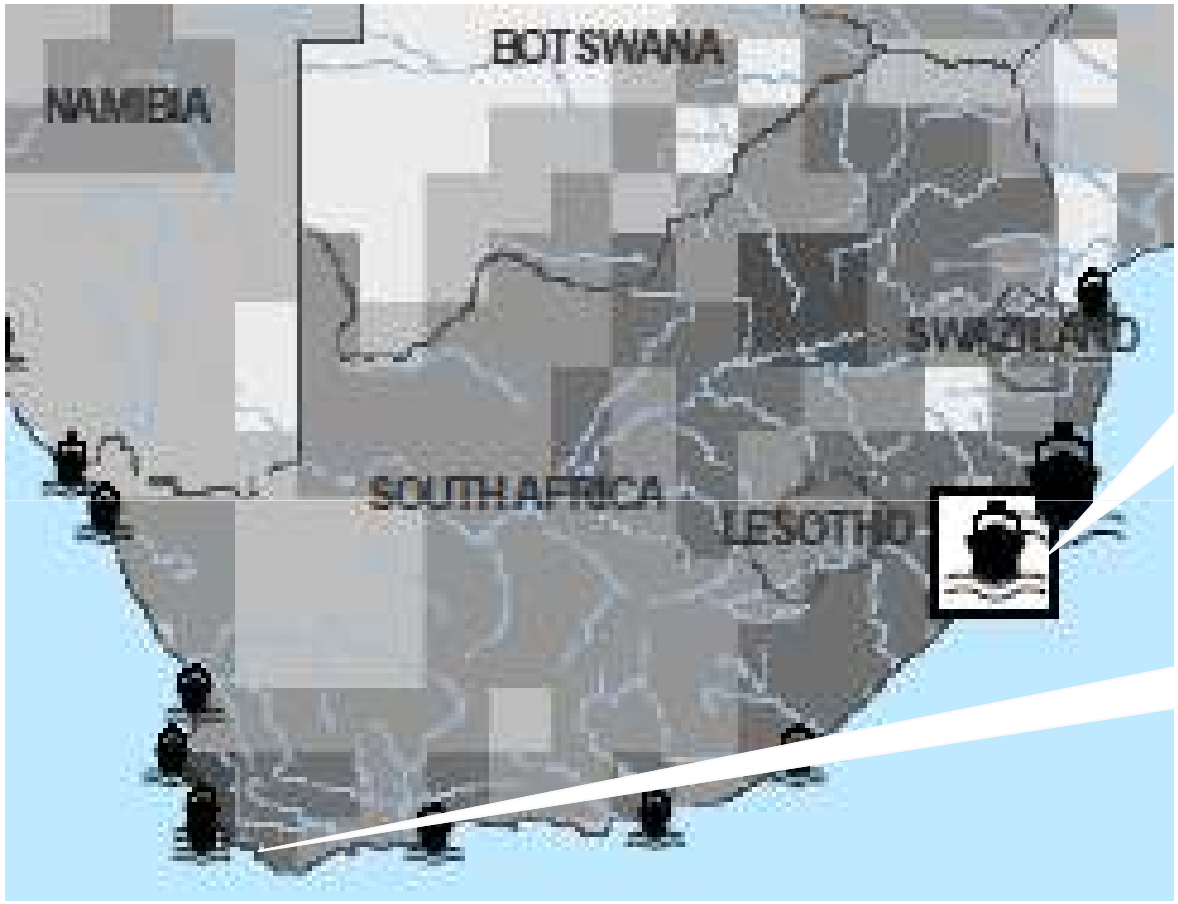


South Africa has a pretty extensive network of railroads that connect major cities and ports

Railroads also connect to neighboring countries

Source: AICD: SADC Infrastructure Regional Report, 2007

Mozambique has numerous sea ports along its coast, which is how major imports come into the country



- Durban harbor is a major port for South Africa as well as the entire Southern Africa region
- Durban plays a dominant role in regional trading patterns
- Many imports come through Durban harbor to some of the more in-land countries

While South African ports are the best in Africa, they lag in global price and productivity benchmarks[1]

Source: AICD: SADC Infrastructure Regional Report, 2007

[1]Assertions based on AICD report, pg 32

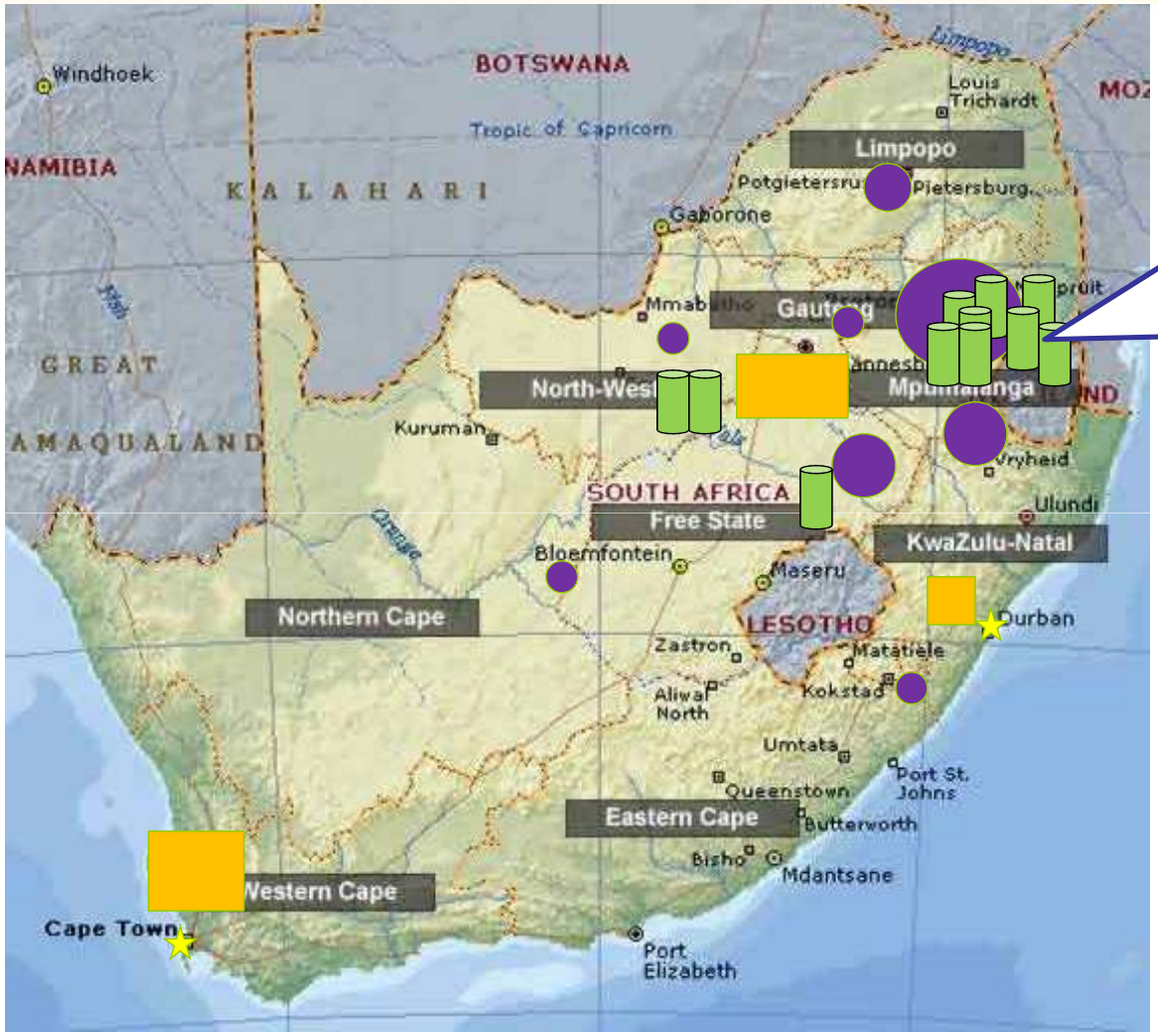
Unreliable electricity and water pollution/quality issues exist; but are generally good compared to the region

Infrastructure	Description	Impact on Soy
Electricity	• Electricity is often unreliable • Power outages occur, especially in some remote areas	• Farms that rely on irrigation schemes need electricity, so this could affect soy production slightly since soy planting times are relatively short • Processors who rely on electricity to extract soy products also would be affected, which could lead to lost opportunity costs and margins
Water	• Some areas have polluted water • Farmers have also experienced poor water quality, especially in rural areas	• Farmers could experience a bad crop year due to polluted water, which would affect soy production and profitability • Water is also used for soy processing, depending on the method; if water is polluted, it could affect the quality of the soy product produced (cake, oil, or soy derivative) • This problem can be even more severe for soy products made for human consumption

While these infrastructure issues exist, the overall electricity and water within South Africa are generally good compared to the rest of the Southern Africa region

Source: TechnoServe Interviews, January 2011

South Africa has numerous storage silos; soybean storage is mainly located in Mpumalanga



- Numerous storage units exist in South Africa, mainly around the Mpumalanga province
- In 2009/10, at least 24 silos were registered with SAFEX, specifically for soybeans
- Interviews also reveal that there may be a monopoly of storage facilities in Durban that could be affecting the market (although this is speculative)

Legend

Storage Unit

Production area

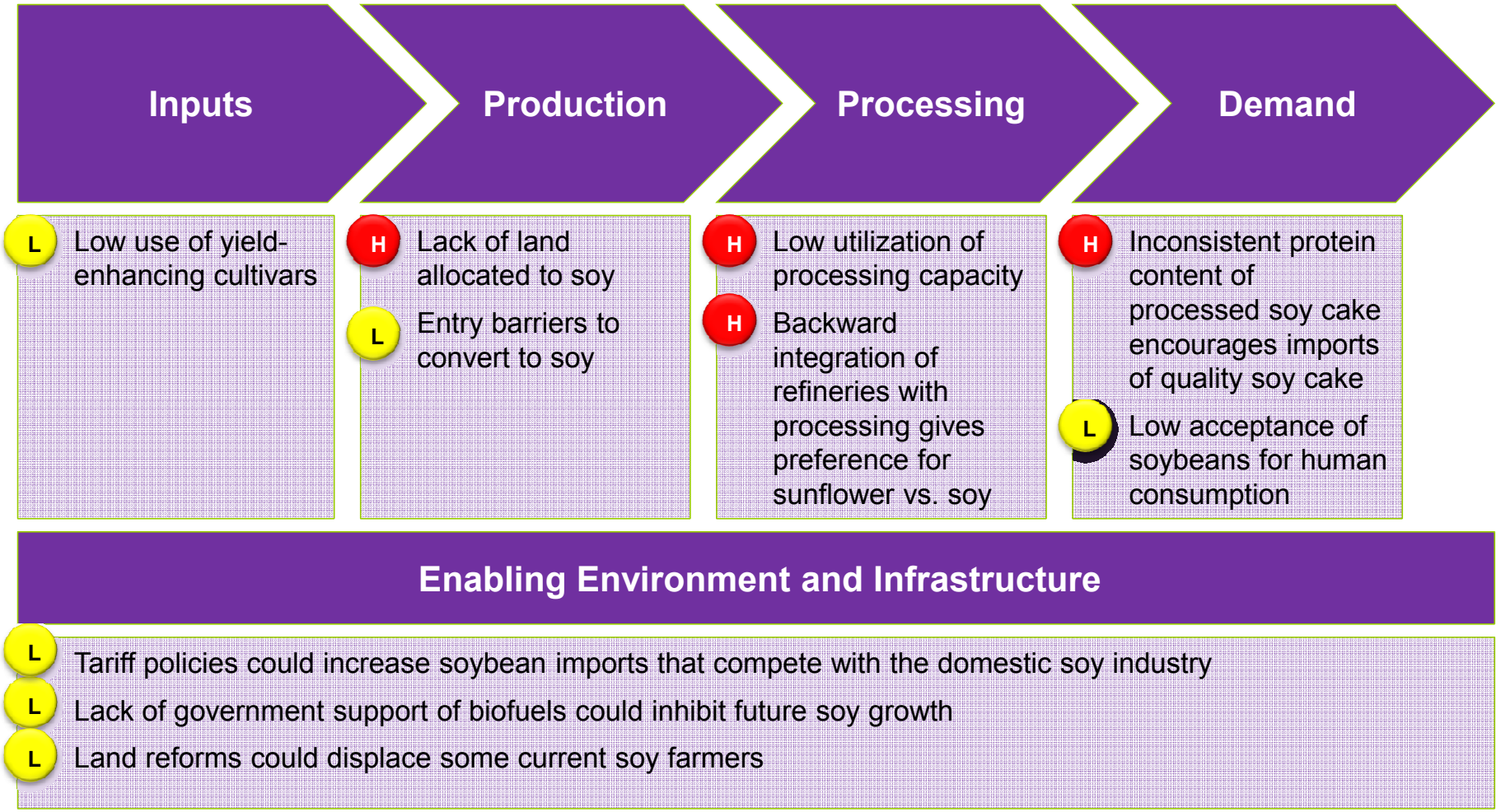
Demand area

Source: Grain SA/ Graan SA; NAMC Analysis

Agenda

- The South African soy market is the largest and most mature in the region; production is dominated by commercial farmers with continued future growth
- The strong soy market and relatively make soy a marginally attractive crop for commercial farmers, yet analysis of the soy value chain reveals some of the industry's shortfalls
- **Lack of land allocated to soy, lack of processing utilized for soy, and soy cake quality concerns inhibit the soy industry's growth**
- Therefore, South Africa must overcome these constraints and encourage farmers to allocate more land to soy to take advantage of the soy opportunity through a number of key initiatives initiatives
- In order to achieve the land reallocation goal, smallholder farmers must graduate to emerging farmers

South Africa faces a number of challenges across the value chain that prevent it from making the most of the opportunity



Low use of yield-enhancing cultivars constrain South Africa from improving its yield

LOW

Low use of yield-enhancing cultivars

Challenge

- Research and development is being done in Argentina and Brazil of cultivars that can improve yield
- Currently, South Africa does not use these yield-enhancing cultivars

Impact

- Yield-enhancing cultivars have the ability to increase yields depending on the area and the agronomics that are used in addition
- South Africa could benefit by using this cultivar to increase current yields from 1.9 MT/Ha

Source: TechnoServe Interviews, January 2011

Lack of land allocated to soy inhibits soy production, as most growth will come from increased land rather than yield improvements

HIGH

Lack of land allocated to soy

Challenge

- South Africa has a limited to the amount of land available for soy due to agroclimatic reasons and the large amount of land dedicated to maize and other crops
- In order to meet current demand, the amount of land allocated to soy would need to almost triple

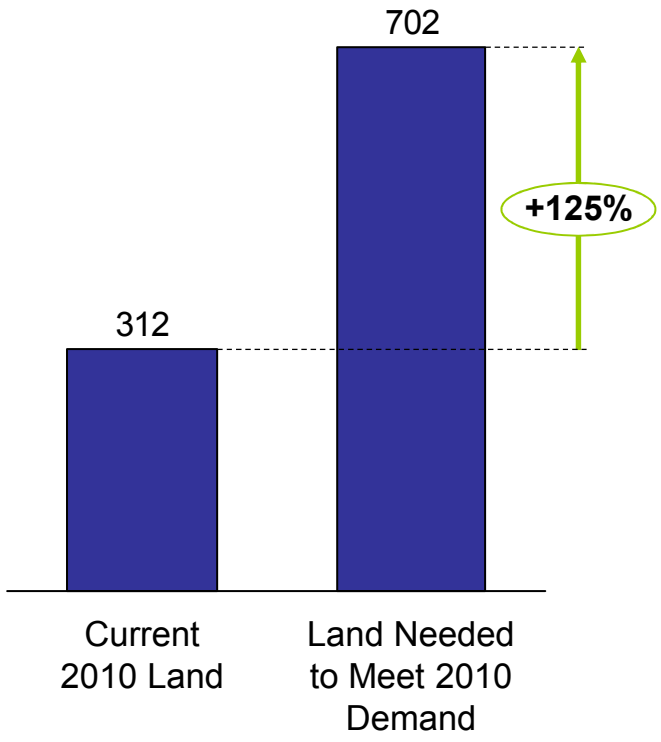
Impact

- Soy production increases will most likely come from increased land planted to soy rather than yield improvements
- In order to increase land for soy, land must be taken away from maize, most likely through crop rotation with soy

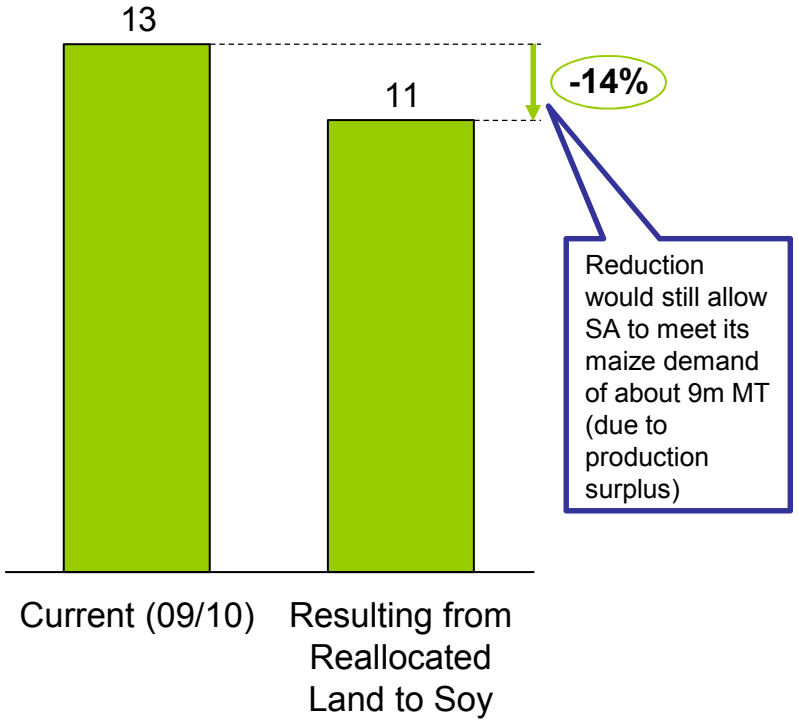
Source: TechnoServe Interviews, January 2011

In order to meet soybean current demand, land must be reallocated from maize to soy, equating to a 19% decrease in maize production

Additional land needed for soy,
2010, '000 Ha



Resultant Maize Production due to Reallocation of Land from Maize to Soy,
2010, Millions MT

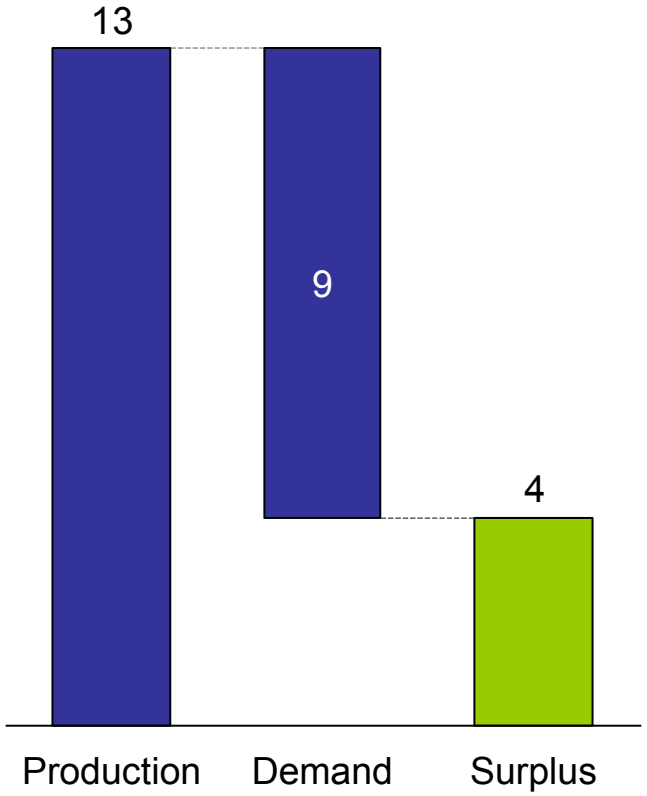


391k Ha must be reallocated from maize to soy in order to meet the 1.3m MT soybean demand, resulting in a 1.9m MT decrease in maize production (given current average yields). Given the current maize production surplus, this decrease would still allow SA to meet its maize demand.

Source: Grain SA/ Graan SA; TNS Interview, November 2010; TechnoServe analysis;
Assumed 2.7M Ha of maize, average maize yield of 4.8, and current maize production of 13M MT

If surplus maize production land was reallocated to soy, there would be 842k Ha of land available for soy production

Maize Production, Demand, Surplus
2010, Millions MT

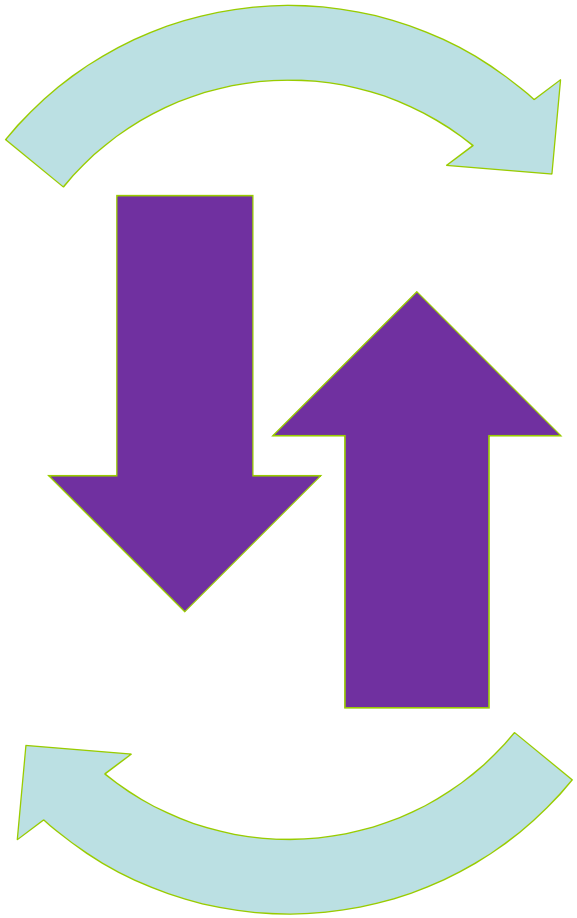


If maize land associated with this maize surplus was reallocated to soy (to balance out the maize surplus, while still satisfying maize demand), there would be an **additional 842k Ha of land available for planting soy**

Source: Grain SA/ Graan SA; TNS Interview, November 2010; TechnoServe analysis;
Assumed average maize yield of 4.8, and current maize production of 13M MT, demand of 9M MT

Soy and maize have an interesting inverse relationship, which could affect the rate at which land reallocation/ crop rotation takes place

- Due to maize surpluses, **maize prices have decreased**, despite international maize price increases, which makes **soy more attractive** (and maize less attractive)
- As farmers **reallocate land from maize to soy** through crop rotation, **maize prices will rise** as the surplus shrinks

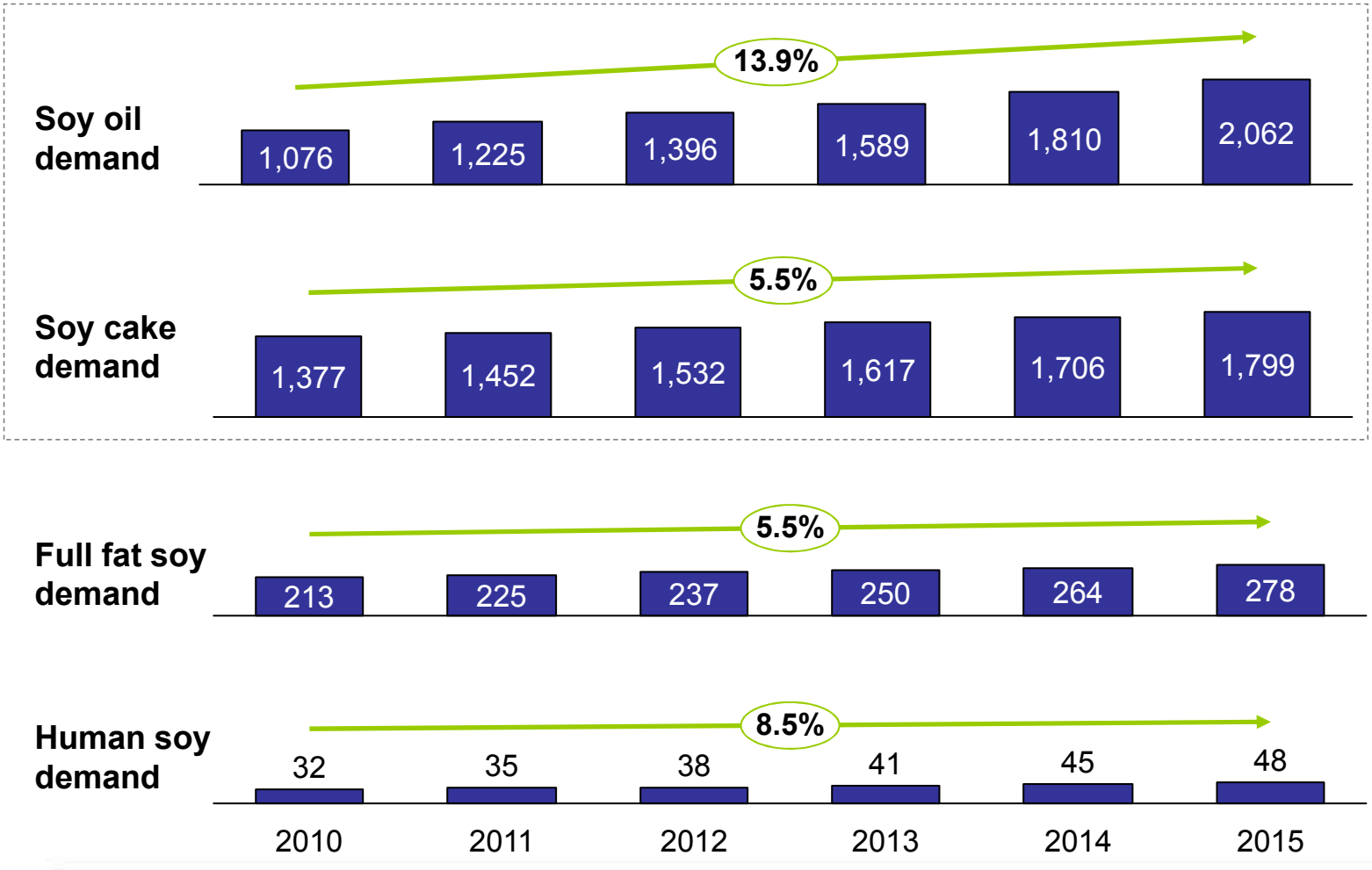


- **Increases in maize prices** in South Africa, makes **soy less attractive** (and maize more attractive)
- Farmers will then **switch from soy back to maize**, which would **repeat this cycle**

Source: TNS Interviews, January 2011

When looking at future demand for soy, over the next five years, this demand almost doubles, exacerbating the land situation

Projected demand for soy products, 2010-2015, '000 MT soybean equivalent[1]



~18% and ~80% of a soybean are used to make soyoil and soy cake

Source: TechnoServe/NAMC Analysis

[1]Soybean equivalent is the amount of soybeans it takes to produce soy oil or cake (0.18 and 0.8 MT soybeans to produce of 1MT of soy oil and soy cake, respectively)

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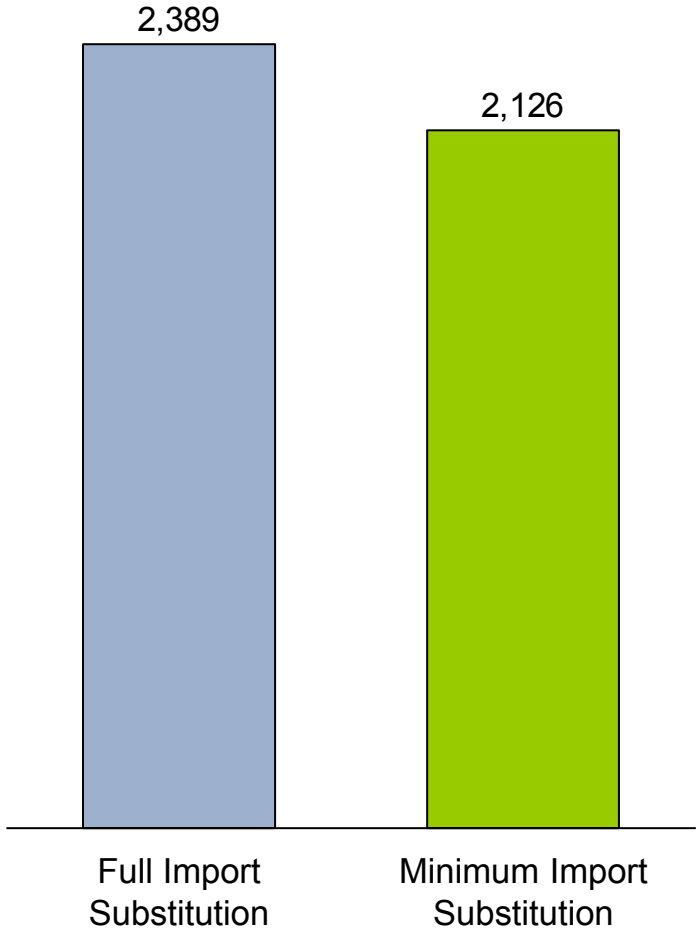
South Africa has three options to address this projected 2015 demand

2015 projected demand for soy products,
'000 MT soybean equivalent[1]



SA Options to Address Demand

- **Full Import Substitution** – as South Africa's requires more soy beans for oil than it needs for cake, full import substitution implies that it produces to its oil demand and exports its excess cake
- **Minimum Import Substitution** – as South Africa requires less beans for its cake demand than it does for its oil demand, minimum import substitution implies that it produces to its cake demand and imports any shortfall in oil
- **Continue to import both cake and oil** – South Africa continues to produce insufficient soy for either cake or oil demand and therefore continues to import both

Source: TechnoServe/NAMC Analysis
[1]Soybean equivalent is the amount of soybeans it takes to produce soy oil or cake (0.18 and 0.8 MT soybeans to produce of 1MT of soy oil and soy cake, respectively)

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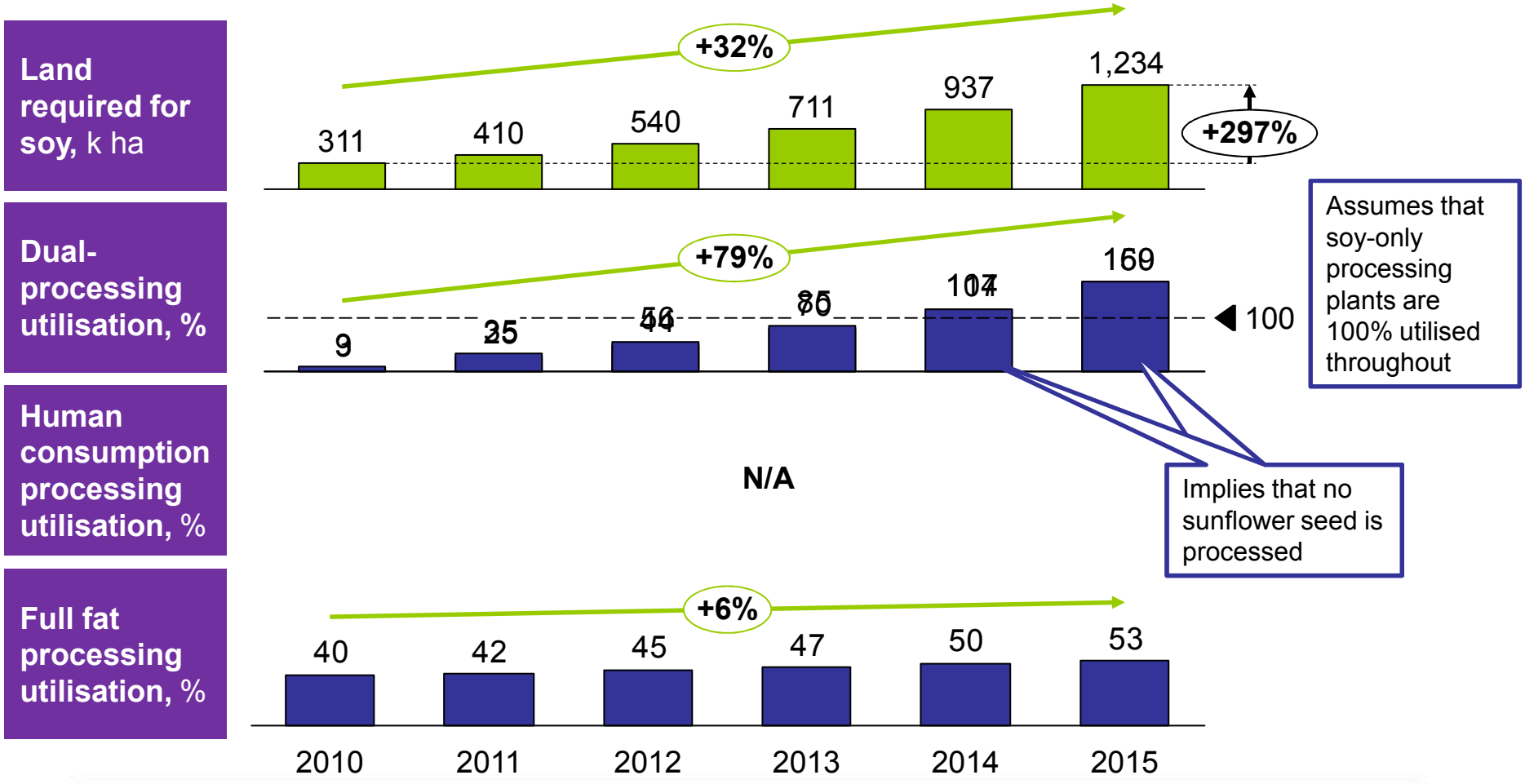
South Africa can try to satisfy demand through import substitution by meeting demand for all soy products or just utilizing local soybeans

	Full import substitution	Minimum import substitution
Processed for full fat cake	Produce and process sufficient beans to meet all of South Africa's full fat needs	Produce and process sufficient beans to meet all of South Africa's full fat needs
Processed for human solid consumption	Produce and process sufficient beans to meet all of South Africa's human solid consumption needs	Produce and process sufficient beans to meet all of South Africa's human solid consumption needs
Processed into cake and oil	Produce and process sufficient beans to meet **ALL** of South Africa's cake **AND** oil demand, exporting any excess (so, if oil demand is greater than cake demand, produce enough for oil and export any excess cake)	Produce and process sufficient beans to meet the **LESSER** of South Africa's cake **OR** oil demand, importing any shortfall (so, if oil demand is greater than cake demand, produce enough cake and import the oil shortfall)

If South Africa aims for full import substitution, it will need to increase land growing soy by 297% and add 69% to current processing capacity

FULL IMPORT SUBSTITUTION



Source: TechnoServe/NAMC Analysis

[1]Soybean equivalent is the amount of soybeans it takes to produce soy oil or cake (0.18 and 0.8 MT soybeans to produce of 1MT of soy oil and soy cake, respectively)

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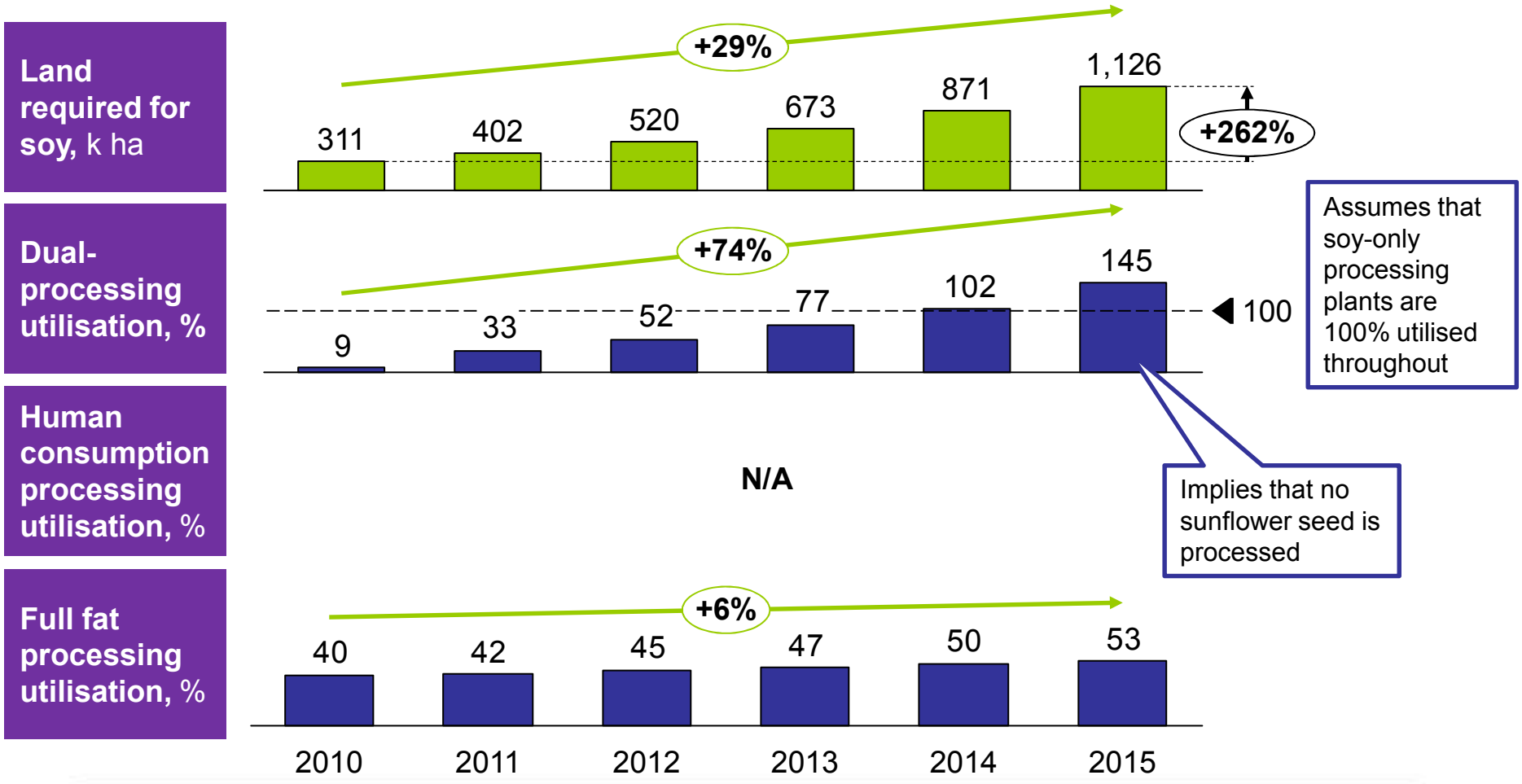
If SA aims for minimum import substitution, it will need to increase land growing soy by 262% and add 45% to current processing capacity

MINIMUM IMPORT SUBSTITUTION



Source: TechnoServe/NAMC Analysis

[1]Soybean equivalent is the amount of soybeans it takes to produce soy oil or cake (0.18 and 0.8 MT soybeans to produce of 1MT of soy oil and soy cake, respectively)

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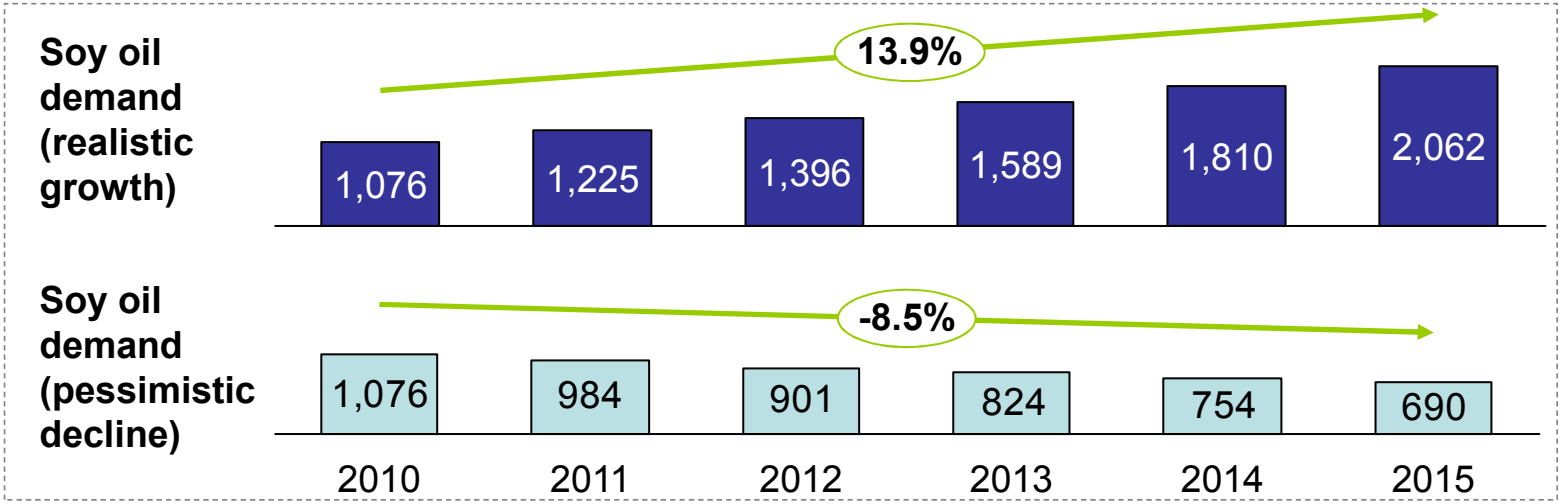
Assuming a more pessimistic decline in soy oil demand (-9%), soybean demand for soy oil will decrease to 690k MT in 2015

Projected demand for soy oil, 2010-2015, '000 MT soybean equivalent[1]



~18% and ~80% of a soybean are used to make soyoil and soy cake

Source: TechnoServe/NAMC Analysis

[1]Soybean equivalent is the amount of soybeans it takes to produce soy oil or cake (0.18 and 0.8 MT soybeans to produce of 1MT of soy oil and soy cake, respectively)

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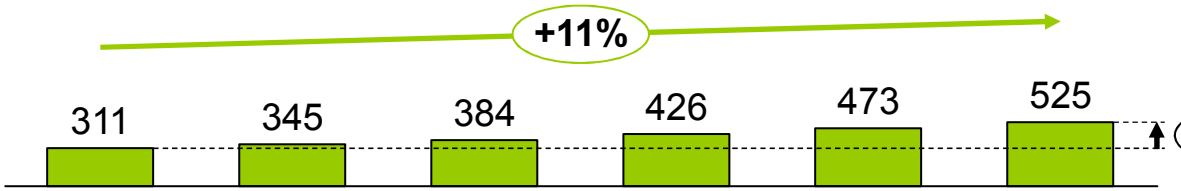
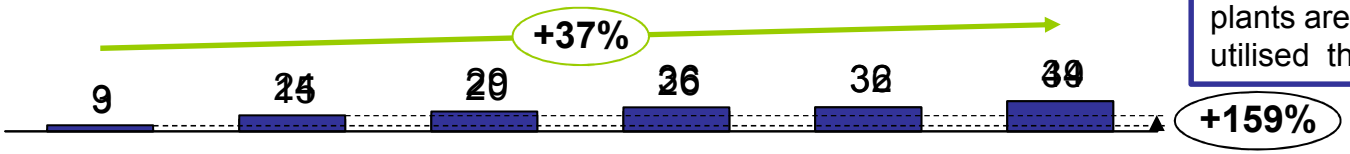
Even in this low oil scenario, if South Africa only aims for minimum import substitution, it will need 69% additional land for soy

MINIMUM IMPORT SUBSTITUTION

Land required for soy, k ha



Dual-processing utilisation, %

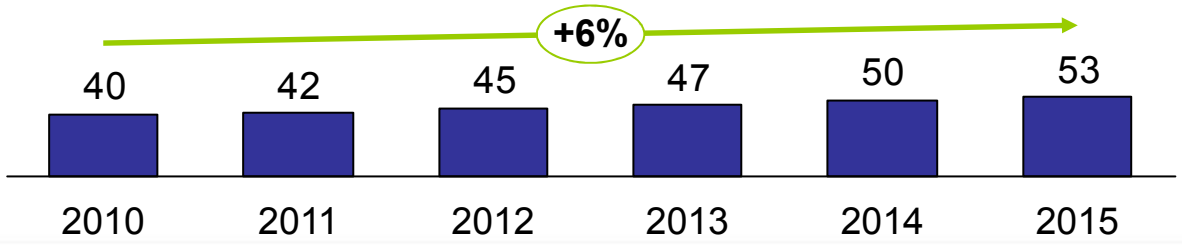


Assumes that soy-only processing plants are 100% utilised throughout

Human consumption processing utilisation, %

N/A

Full fat processing utilisation, %



Source: TechnoServe/NAMC Analysis

[1]Soybean equivalent is the amount of soybeans it takes to produce soy oil or cake (0.18 and 0.8 MT soybeans to produce of 1MT of soy oil and soy cake, respectively)

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Entry barriers to convert to planting soy could inhibit the growth of the soy industry

LOW

Entry barriers to convert to soy

Challenge

- There are entry barriers exist for farmers that switch from maize to soy
- Barriers include the cost of buying specialized machinery and mechanical tools for precision farming, specific for soy
- While wheat farmers can initially utilize the same columbine, they will eventually need to purchase specialized soy tools in order to harvest soy properly

Impact

- The increased cost of purchasing precision farming tools make it less attractive for commercial farmers to convert to planting soy
- As a result, the soy industry could experience slow growth if farmers are not inclined to plant more soy

Source: TechnoServe Interviews, January 2011

Processing capacity is not being utilized for soy processing due to the oil refineries that drive processing decisions, preferential toward sunflower

	Challenge	Impact
HIGH **Lack of utilization of processing capacity**	• While processing capacity exists to meet current demand, much of this capacity is not being utilized for soy processing • Instead, processing plants are being utilized for sunflower seed processing, mainly for its oil, which is then refined for sale • In the future, utilization would need to rise at least by 118% p.a. in order to meet the projected demand for soybeans by 2015 (for soy cake)	• Lack of utilization of processing capacity will restrict the growth of the soy industry • Without an adequate market for soybeans, in terms of processing, soybean production will be hindered
HIGH **Backward integration of refineries with processing gives preference for sunflower vs. soy**	• Oil refineries have backward integrated into oilseed processing, mainly of sunflower seeds • Oil refineries' goal is to be at 100% utilization at the risk of not utilizing their processing capacity; since sunflower oil demand is so strong, many refineries/processors give preference toward sunflower processing over soy, despite potentially better profitability with soy processing • Feed industries have not done much backward integration into processing, aside from full-fat soy processing	• Due to backward integrated refineries that are driven by demand for sunflower, processing decisions usually favor sunflower • Feed industries will then have to continue to import their soy cake (low/medium) to make up for the lack of domestically produced soy cake

Source: TechnoServe Interviews, January 2011

Inconsistent protein content of processed cake and low acceptance of soy in human consumption negatively affect soy demand industry growth

	Challenge	Impact
HIGH **Inconsistent protein content of processed soy cake encourages imports of quality soy cake**	• Protein content of processed cake has been reported as inconsistent • Processed soy cake can range in protein consistency, which makes it hard for feed manufacturers to rely on; variations in protein content extend the amount of days it takes to rear a chicken, resulting in lost income • Some speculate that this variation in protein content and quality is due to the use of soybean hulls in processing • soy cake imported from Argentina has a consistent quality of 48%protein	• Due to these inconsistencies, feed manufacturers choose to import soy cake from Argentina that is of a consistent 48% protein content • These inconsistencies will inhibit future growth of the domestic soy cake market if imports are favored over domestically-sourced soy cake
LOW **Low acceptance of soybeans for human consumption**	• Historically, soybeans in South Africa have not been accepted within diets due to their taste • Smallholder farmers, who usually are subsistence farmers usually only plant staple crops such as maize that they can eat • Efforts are being made to encourage soy human consumption both by smallholder farmers and the general South African population	• As smallholder farmers start to consume soy, they will be more incentivized to plant soy for their own consumption and sale for additional income • Human consumption increases will also drive up demand for soybeans

Source: TechnoServe Interviews, January 2011

Import tariff rebates on soy products and a lack of government support for biofuels could inhibit soy growth

	Challenge	Impact
LOW **Tariff policies could increase soybean imports that compete with the domestic soy industry**	• Numerous parties, representing biofuels and feed manufacturers, are petitioning for soy import tariffs (8%) rebates, which would eliminate the current import tariffs for soybeans and soy cake • The International Trade Administration Commission (ITAC) granted SASOL's application for import tariff rebates for imported soybeans used for biofuels, which expires June 2011 • ITAC did not accept AFMA's petition for soy import tariff rebates for imported soy cake on the basis that more research must be done to see how this will affect the domestic soy cake market	• If import tariff rebates are given for soy products, the domestic soy industry could be at risk due to increased competition with imported soy products • Domestic soy industry still has room to develop and grow, but its competitiveness to imports could be reduced; however, domestic beans would still be competitive as import parity is more than 8% higher than domestic prices
LOW **Lack of government support of biofuels could inhibit future soy growth**	• While the government did issue the Biofuel Industrial Strategy to encourage biofuel growth and use of oilseeds such as soy for biodiesel, there has been very little investment in soy for biodiesel	• If there is a lack of support for soybeans as feedstock for biodiesel, soy oil demand could decrease even further • Without soy oil demand, soy processing and even production could suffer

Source: TechnoServe Interviews, January 2011

Land reforms could displace current soy farmers, which would hinder continued soy production growth

LOW

Land reforms have the potential to displace some current soy farmers

Challenge

- Land redistribution could affect the land that is currently being used for soy and future land that is planted with soy
- Many farmers fear what the outcome may be of these land reforms; some farmers have moved to the DRC after South Africa signed a deal allowing South African farmers to lease up to 10-million hectares of land for production of maize, soy beans, poultry, dairy cattle and other produce
- Land redistribution will also affect black smallholder farmers, who may become the recipients of this reform

Impact

- Land redistribution could displace current soy farmers, while giving land to farmers who may not have any experience or knowledge about planting soy, thereby inhibiting soy production growth
- While redistribution could open up numerous opportunities for smallholder farmers, it could create a "hiccup" in the soy industry while smallholder farmers get up to speed

Source: TechnoServe Interviews, January 2011; DAFF, Strategic Plan for South African Agriculture; "South Africans to farm in Congo," *SouthAfrica.Info*, October 2009

Agenda

- The South African soy market is the largest and most mature in the region; production is dominated by commercial farmers with continued future growth
- The strong soy market and relatively make soy a marginally attractive crop for commercial farmers, yet analysis of the soy value chain reveals some of the industry's shortfalls
- Lack of land allocated to soy, lack of processing utilized for soy, and soy cake quality concerns inhibit the soy industry's growth
- **Therefore, South Africa must overcome these constraints and encourage farmers to allocate more land to soy to take advantage of the soy opportunity through a number of key initiatives initiatives**
- In order to achieve the land reallocation goal, smallholder farmers must graduate to emerging farmers

Near-term actions should focus on encouraging planting of soy on more land for all farmer types and improving soy cake processing quality

Item	Constraint	Recommended Action(s)	Timing

A	Lack of land allocated to soy	***Marketing campaign for crop rotation amongst commercial, new, and smallholder farmers***
		• **Encourage use of crop rotation (maize/soy) by commercial farmers to convert to soy**
		• **Aggressively encourage the planting of soy by new farmers**, who acquired new land as a result of Land Reform
		  • *Unlock supply side constraints (extension services, access to inputs, etc.) for new farmers*, who have additional hectares of land that could be used for soy and other crops
		  • Educate new farmers on the benefits of crop rotation
		• **Encourage the planting of soy by current smallholders**
		  • *Unlock supply side constraints (extension services, access to inputs, etc.) for smallholder farmers* that include agronomic best practices
			Near-term

B	Inconsistent protein content of processed soy cake encourages imports of quality soy cake	***Improved soy cake processing standards***
		• **Improve processing quality**
		  • *Feed manufacturer and soyoil processors should use standard quality processes* (husk removal, denaturing process, etc.)
		  • Set-up grading standards with feed manufacturing stakeholders
		• **Investigate new cultivars for soy protein**
		  • Conduct studies to assess the cost/ benefits of new cultivars that should aim for increased protein content for soy
			Near-term

Medium-term solutions should encourage soy human consumption, especially amongst smallholders

Item	Constraint	Recommended Action(s)	Timing
C	Lack of utilization of processing capacity	• **TBD**	Medium-term

D	Low acceptance of soybeans for human consumption	***Soy nutrition campaign and extension services***
		• **Encourage the acceptance of soy within diets**
		  • *NGOs and donor organizations can educate smallholders* about the nutritional value of adding soy to their diets
		  • *NGOs and donor organizations can provide small-scale processing options* (Vita Goat, Soy Cow) for smallholder farmers to increase human consumption of soy
		  • Link government and research universities (private/public partnership) to provide more research for new cultivars that can improve tastt
		• **Offer extension services to smallholder farmers**
		  • *Government/NGOs provide extension services to smallholder farmers* to improve smallholder farmer's agronomic practices when farming soy
			Medium-term

Additionally, use of yield-enhancing cultivars could improve yields, thereby increasing production on less land

Item	Constraint	Recommended Action(s)	Timing
E	Low use of yield-enhancing cultivars	***Increased use of yield-enhancing cultivars*** • **Research and public/private partnerships** • Links between producers and research institutions to increase the use of yield-enhancing cultivars	Medium-term

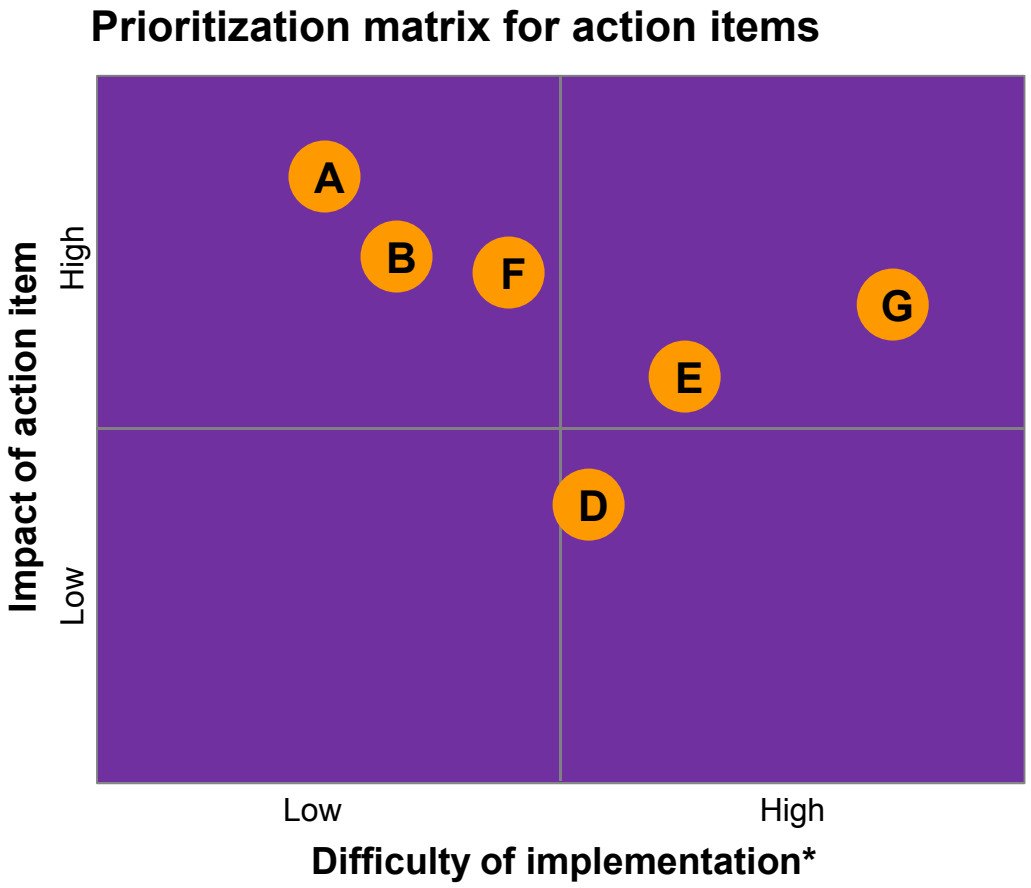
F	Entry barriers to converting to soy	***Formation of a soy association***
		• **Form a soy association to advocate for the industry**
		  • Work with commercial farmers to address the high cost of converting to soy (for precision farming)
		  • Re-enforce ties within the government agriculture community (ITC/ NAMC/ etc.)
			Medium-term

Long-term actions should revolve around post-land reform assistance to provide mechanisms that aid displaced and new farmers in planting soy

Item	Constraint	Recommended Action(s)	Timing

G	Land reforms have the potential to displace some current soy farmers	***Post-land reform assistance***
		• **Explore opportunities for farming outside South Africa, within the region**
		  • *Government to encourage soy farming within the region for displaced soy farmers* to stimulate commercial farming in other neighboring countries (e.g., Mozambique)
		  • Create links with AGRISA and Transvaal Agricultural Union (TAU) to explore opportunities abroad
		• **Encourage partnerships between commercial and smallholder farmers**
		  • *Government encourages agri-business models (ABPs) to successfully execute land reforms*, while also benefiting both sets of farmers
		  • *Develop contract/bartering system between new farmers and commercial farmers* to encourage development of land in exchange for inputs and extension services
			Long-term

Actions should be prioritized based on their impact and difficulty to implement



Item	Action Item Summary
A	Marketing campaign for crop rotation amongst commercial, new, and smallholder farmers
B	Improved soy cake processing standards
C	TBD
D	Soy nutrition campaign and extension services
E	Increased use of yield-enhancing cultivars
F	Formation of a soy association
G	Post land reform assistance

C

Note: * Relative ease of implementation takes into consideration the stakeholders involved, the level of political difficulty, the cost of fixing it, and the time it would take to fix the constraint

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Agenda

- The South African soy market is the largest and most mature in the region; production is dominated by commercial farmers with continued future growth
- The strong soy market and relatively make soy a marginally attractive crop for commercial farmers, yet analysis of the soy value chain reveals some of the industry's shortfalls
- Lack of land allocated to soy, lack of processing utilized for soy, and soy cake quality concerns inhibit the soy industry's growth
- Therefore, South Africa must overcome these constraints and encourage farmers to allocate more land to soy to take advantage of the soy opportunity through a number of key initiatives initiatives
- **In order to achieve the land reallocation goal, smallholder farmers must graduate to emerging farmers**

South Africa has an ambitious plan for its land reform; however, it still has a long way to go

Strategic objective	Output	Performance indicator/ measure
Redistribution 30% of white-owned agricultural land by 2014 for sustainable agricultural development	**Productive white-owned agricultural land provided to black South Africans** for sustainable agricultural development	**24.9 million hectares** of productive-white-owned land provided to **60k individual black South Africans** by 2014

2009/10 Target Goal	2009/10 Actual Achievement
656k ha redistributed	**240k ha** redistributed; Budget for land reform (households) were reprioritized
12.8k beneficiaries	**11.4k** beneficiaries

Only 37% of its land redistribution goal was achieved in 2009/10, leaving a large amount of land that is still left for redistribution

Source: Department of Rural Development and Land Reform: Annual Report April 2009-March 2010

In order to reach South Africa's Land Reform target, smallholder farmers must graduate to emergent commercial farmers

Business

Commercial farming 'key to land reform'

14 January 2011

The establishment of successful black commercial farmers was key to land reform in South Africa, Agriculture Minister Tina Joemat-Pettersson told black and white commercial farmers during a visit to a farm in the Free State province.

Source: Sapa, 2011

Given 2009/10 results, a **single beneficiary receives on average 21 ha of land**, which is often hard to manage as a smallholder (often cultivating only on 2 or less hectares of land)

In order to successfully meet this target without inhibiting the agricultural industry, **smallholder farmers must become emergent commercial farmers to make the most of their newly acquired land**

Source: Southern African Regional Poverty Network, http://www.southafrica.info/news/business/442005.htm

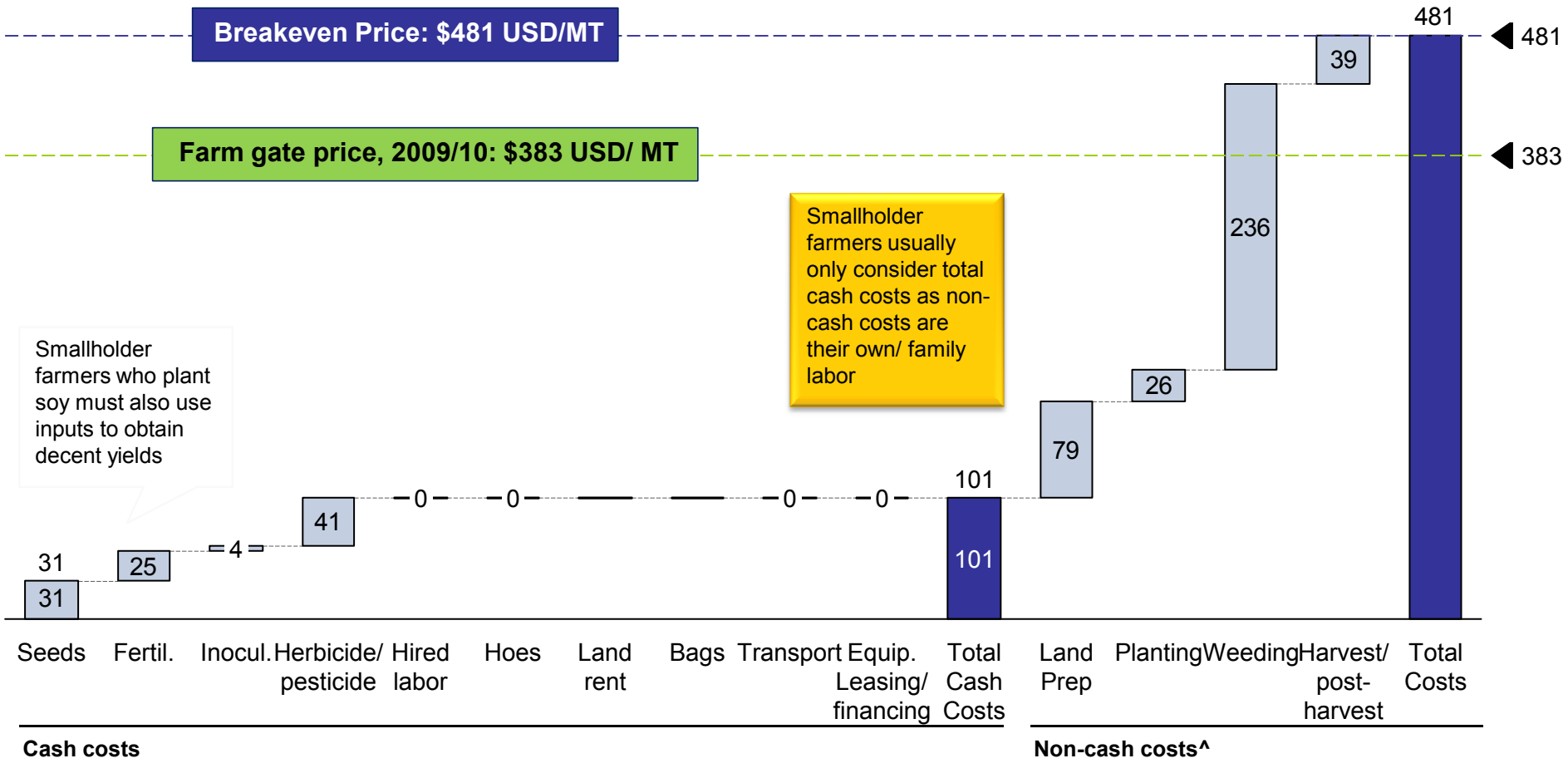
In order to realize these benefits, the following challenges must be overcome

Challenges	Strategies to overcome these challenges
Culturally do not use soy within their diets (soy is perceived as a meat-substitute)	• Low cost, small-scale processor machines such as Soy Cow and Vita Goat allow communities to process soybeans into soy milk, soy cake, and soy oil for consumption • Increase education related to the benefits of soy • Post-land reform efforts could be focused on teaching farmers to plant both maize and legumes (soy)
Smallholders are not necessarily set-up to grow soy	• Growth must start with commercial farmers to create a stable and strong soy industry, with which smallholder farmers can follow-suit • Smallholder farmers lack the ability to purchase inputs necessary for soy cultivation due to a lack of financing and access to capital; thus partnerships between commercial and smallholder farmers becomes key
Market is dominated by commercial farmers (98%), thus smallholders lack expertise in comparison	• Partnerships between commercial and smallholder farmers (through initiatives such as BBBEE) will allow smallholder farmers to learn key harvesting techniques and will enable stronger collaboration between commercial and smallholder farmers • Smallholder farmers can then utilize soy as a cash crop, thereby increasing their incomes and community well-being

Source: TNS Interviews, January 2011

Smallholder production costs are currently $481 USD/MT or $101 USD/MT cash costs, excluding family labor

Soybean production cost breakdown for smallholder farmer, 2009/10, $USD/MT, Assumed yield: 1.0 MT/Ha



Source: TechnoServe Interviews, January 2011; TechnoServe Analysis

^ Assumed to be the same as hired labor costs (close to minimum wage)

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