

A COMPARATIVE ANALYSIS OF THE DIFFERENT REGIONS OF THE SOUTH AFRICAN SOYBEAN INDUSTRY

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Globally increasing emphasis is put on the impact of government policies/interventions on the functioning of the agricultural sector. This should be seen against the backdrop of increasing awareness regarding environmental and climate change challenges, and ensuring that the world is food secure. One way of determining how policies affect the agricultural sector is to investigate the comparative economic advantage (CEA) of the sector.

This paper evaluates the CEA of soybean production in different agro-ecological zones (12) in South Africa during the 2011/12 season. The results are also compared with a similar analysis done in the 2009/10 season. The Domestic Resource Coefficient (DRC) is used to conduct the CEA analysis. The Nominal Protection Coefficient (NPCo) on tradable outputs, Nominal Protection Coefficient (NPCi) on tradable inputs and Effective Protection Coefficient (EPC) were also calculated. The results show that 11 of the 12 regions have a comparative economic advantage (CEA). The significant difference between market and economic profitability indicates that policies have an impact on this industry's ability to compete. The NPC on outputs and inputs show that policy decreases local prices on outputs and increases the cost on tradable inputs. The EPC shows that producers receive less at farm level for their product than what would have been the case in the absence of policies.

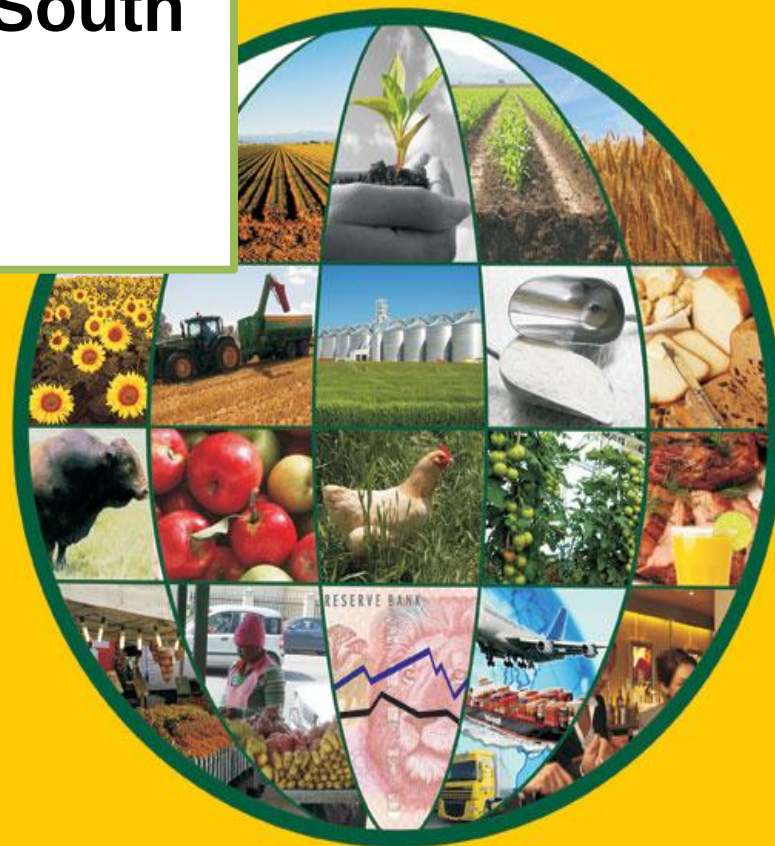
Regional Comparative Analysis of the Soybean Production Regions in South Africa

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National Agricultural
Marketing Council
Promoting market access for South African agriculture



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- **Abstract**
- **Background**
- **Data collection**
- **Methodology applied**
- **Discussion & results**
- **Conclusion**
- **Acknowledgements**

Soybean Study | Abstract

- Globally increasing emphasis is put on the impact of government policies/interventions on the functioning of the agricultural sector.
- This should be seen against the backdrop of increasing awareness regarding environmental and climate change challenges, and ensuring that the world is food secure.
- One way of determining how policies affect the agricultural sector is to investigate the comparative economic advantage (CEA) of the sector.
- This paper evaluates the CEA of soybeans production in different agro-ecological zones (12) in South Africa during the 2011/12 season.
- The results are also compared with a similar analysis done for the 2009/10 season.
- Effective Protection Coefficient (EPC) were also be calculated.
- Nominal Protection Coefficient (NPCi) on tradable inputs,
- The Domestic Resource Coefficient (DRC) is used to conduct the CEA analysis.

The results show that eleven of the twelve regions have a comparative economic advantage (CEA). The significant difference between market and economic profitability indicates that policies have an impact on this industry's ability to compete. The NPC on outputs and inputs shows that policy decreases local prices on outputs and increase the cost on tradable inputs. The EPC shows that producers receive less at farm level for the their product than what would have been the case in the absence of policies.

Soybean Study | Background

- Soybeans produced in South Africa is mainly used for feed & oil
- South Africa is a net exporter of beans and a net importer oil cake/soybean meal & soybean oil
- Imports of oil cake/ soybean meal is mainly from Argentina
- Primary usage for soybean meal/oil cake is for the feed industry
 - Focus on Poultry Industry
 - Poultry industry is the biggest sub- sector in terms of value of production of the South African Agriculture sector.
 - South Africa is under the top 15 consumers of Poultry meat (36.5kg per capita in 2011).

Soybean Study | Data collection

- Enterprise budgets was collected from the Protein Research Foundation for the different production regions in South Africa.
- Differentiation between tradables & non-tradable .
- Shadow/Economic budgets was calculated compiled by removing of distorting factors in the market

Soybean Study | Methodology applied

- Comparative economic advantage (CEA) analysis evaluates the economic efficiency of alternative productive uses of scarce land, labour, capital and water resources.
- For any production option to be the most efficient user of a country's resources, two conditions need to be met.
 - First, *the cost of* producing the product domestically must be less than the cost to import the same product.
 - Secondly, *the gains from using resources* such as land, labour and water must be greater that the opportunity cost of using these resources in other production activities.

- The major difficulty that arises when using the DRC method is the valuing of inputs and outputs,
 - especially when choosing the appropriate opportunity cost of both non-tradable and tradable (Hassan and Faki 1993).
- This difficulty is mainly due to:
 - ✓ absence of markets in the case of non-tradables
 - ✓ lack of correspondence of prices of tradables to their true economic (scarcity) value.
 - Due to market failure and government intervention, market prices often do not reflect the scarcity value of goods and services.
- Therefore a need to distinguish between economic/shadow and market (private) prices.

- In order to derive the shadow prices of tradables and non-tradables, different methods and techniques can be used.
- Shadow pricing of tradables
 - *Conversion method:* $CIFW_{ij} = (IntP_{ij} + TransC_{ij} + Ins_{ij}) \times ExhR_{ij}$ or $CIFW_{ij} = (IntP_{ij} \times (1 + TransF_{ij})) \times ExhR_{ij}$
 - *Tariff protection method:* $W_p = D_p / (1 + T_{pr})$
 - Remove policy distortions from prices, e.g. Fuel
- Shadow pricing of non-tradables
 - Labour: Distinguish between skilled and unskilled labour
 - Water: Several studies (e.g. Hassan; Louw)
 - Land: Rental value of land (Monke and Pearson) approach as calculated by Van Schalkwyk and Van Zyl)

- Other issues to consider:
 - True value of the South African Rand to use to calculate shadow prices of tradables
 - Account for the tradable/non-tradable composition of the value of inputs and products

- ***Effective protection coefficient (EPC)***

An EPC greater than 1 means that private profits are higher than they would be without commodity policies. The transfer from the combination of output and tradable-input policies is positive. An EPC less than 1 indicates an opposite result, while the net effect of policies that alter prices in product markets is to reduce private profits which results in a negative combined transfer effect.

- ***Policy transfers***

Subsidising policies permit inefficient systems to survive; consequently the waste of resources needs to be justified in terms of non-efficient objectives such as unproductive resource allocation. The extent of policy transfers requires the calculation of ratios, such as the nominal protection coefficients on inputs (NPCI), effective protection coefficient (EPC).

- ***Nominal protection coefficient on tradable inputs (NPCI)***

A NPC on inputs shows that policies increase or decrease tradable input cost with a certain % above or below world prices. This means that producers are taxed (if $NPCI > 1$) on tradable inputs or supported (if $NPCI < 1$).

- **Nominal protection coefficient on tradable inputs (NPCI)**

A NPC on inputs shows that policies increase or decrease tradable input cost with a certain % above or below world prices. This means that producers are taxed (if NPCI > 1) on tradable inputs or supported (if NPCI < 1).

- **Domestic Resource Coefficient**

$0 < DRC < 1$; there is a comparative advantage.

$DRC > 1$ = no comparative advantage.

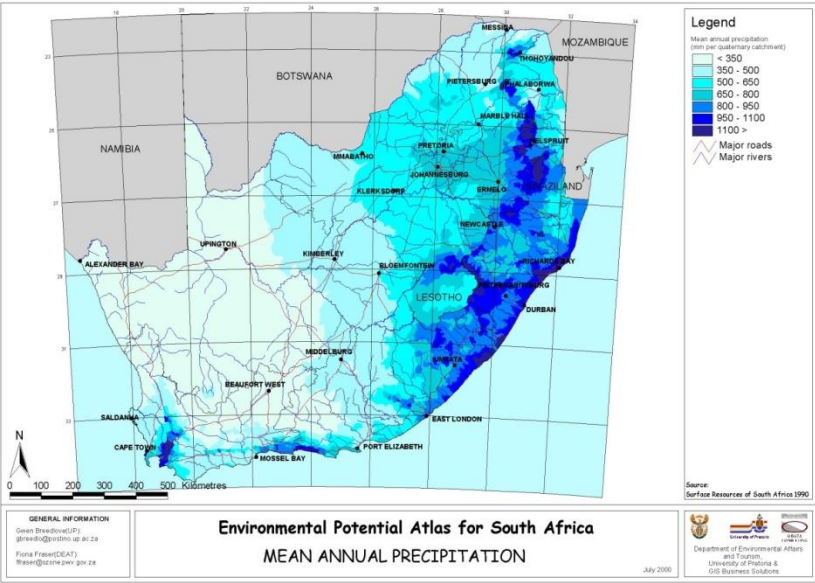
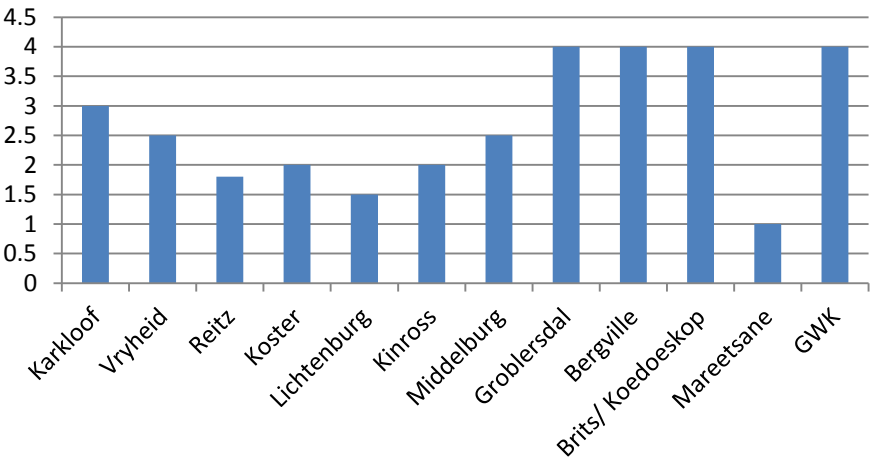
$DRC < 0$ there is a net loss of foreign exchange and no comparative advantage.

Soybean Study | Results & Discussion (Area delineation/Yield)

- Production

- Highest production regions (Irrigation)
 - Groblersdal,
 - Bergville
 - Griekwaland West area (GWK
- Lowest production area
 - Maretsane 1 ton/ha
- Highest dryland area
 - Karkloof area – 3 tons/ha

Yield (Tons/ha)

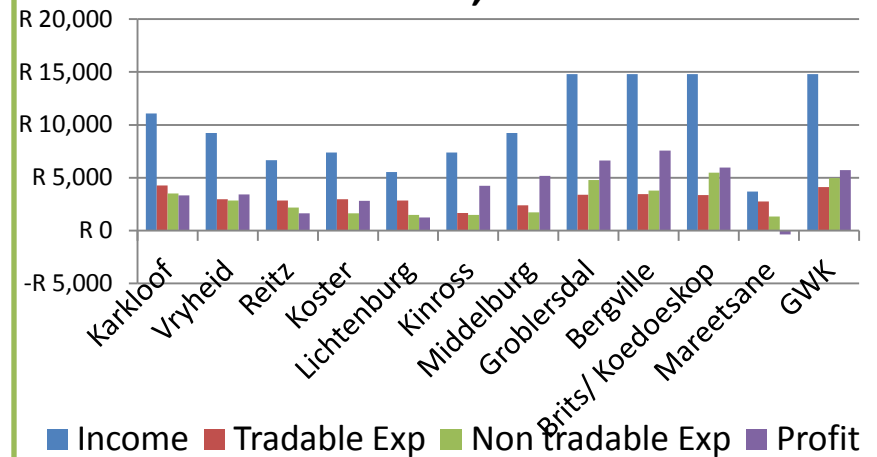


Soybean Study | Results: Market Income, cost & profitability

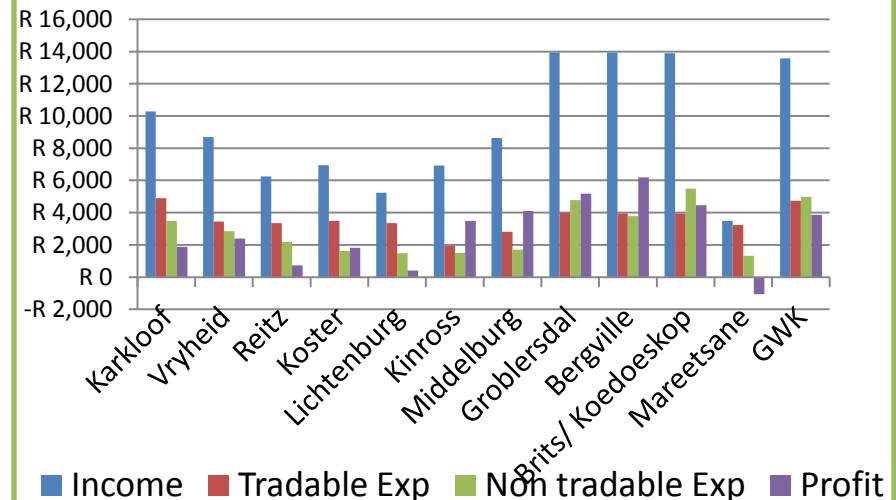
- Economic profit = Income – cost
- Economic profits measure efficiency or comparative advantage.
- Market distortions, will cause economic prices and market prices to differ and therefore the profits will also differ.
- Market profitability in all the regions is fairly good, with Kwazulu Natal performing the best.
- All these regions have the ability to use scarce resources efficiently

- Economic profits indicates higher figures than market profitability.
- The above is a result on higher cost structure due to tax on fuel, higher transport and labour cost due to measure efficiency or comparative advantage.
- Certain tariffs on inputs also contribute to lower profit on the market level

Economic Income, Costs & Profits

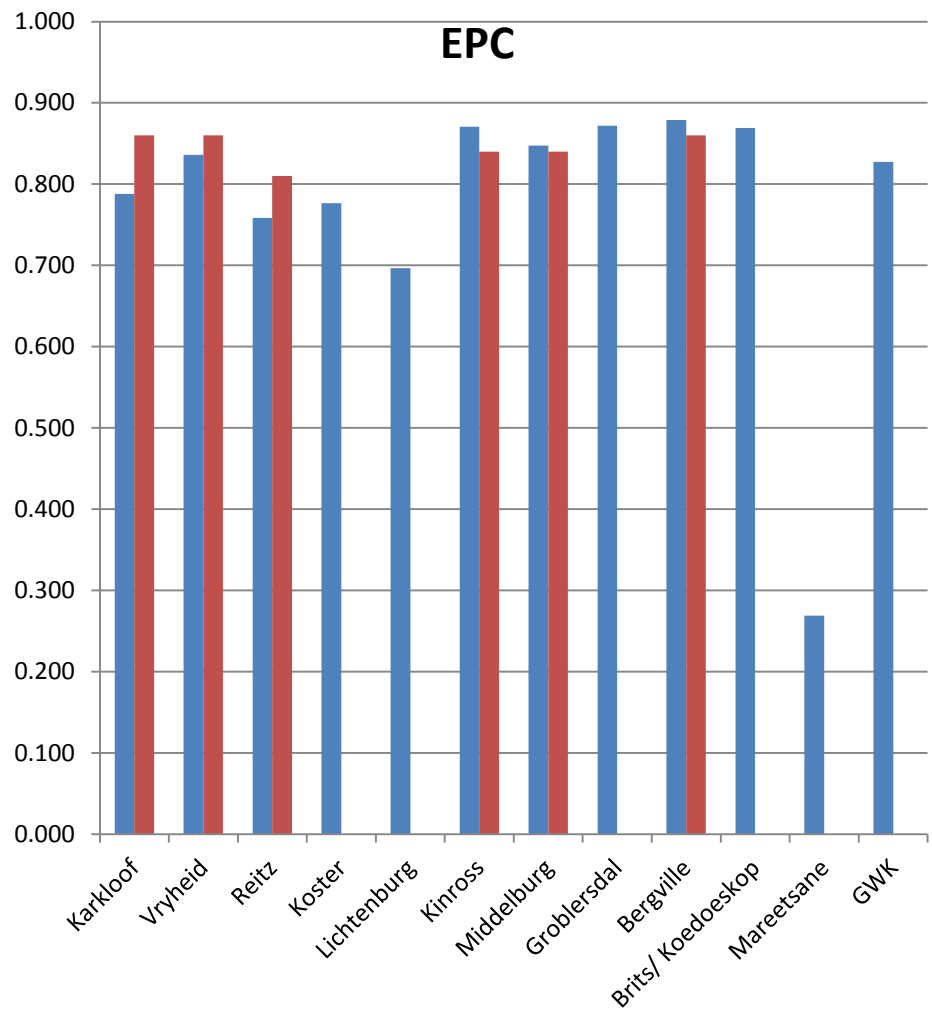


Market Income, Costs & Profits



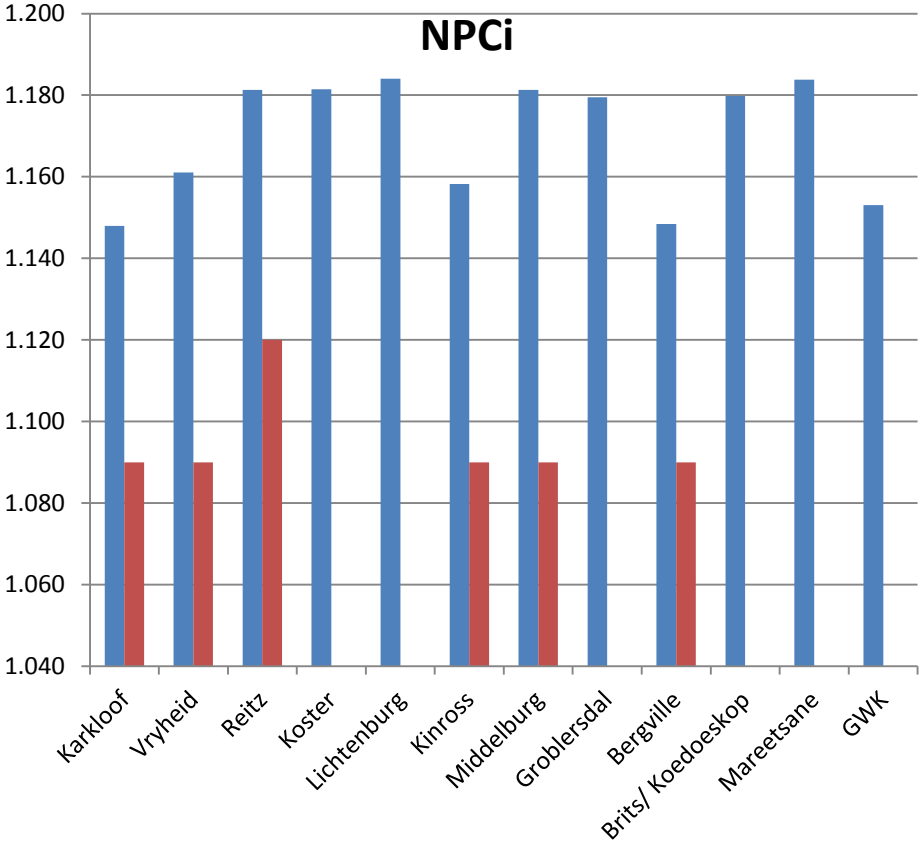
Soybean Study | Results: Effective Protection Coefficient

Effective protection coefficient (EPC)
*An EPC > 1:
Profits are higher than they would be without commodity policies. The transfer from the combination of output and tradable-input policies is positive. An EPC less than 1 indicates an opposite result, while the net effect of policies that alter prices in product markets is to reduce private profits which results in a negative combined transfer effect.*



Soybean Study | Results: Net Protection Coefficient - Inputs

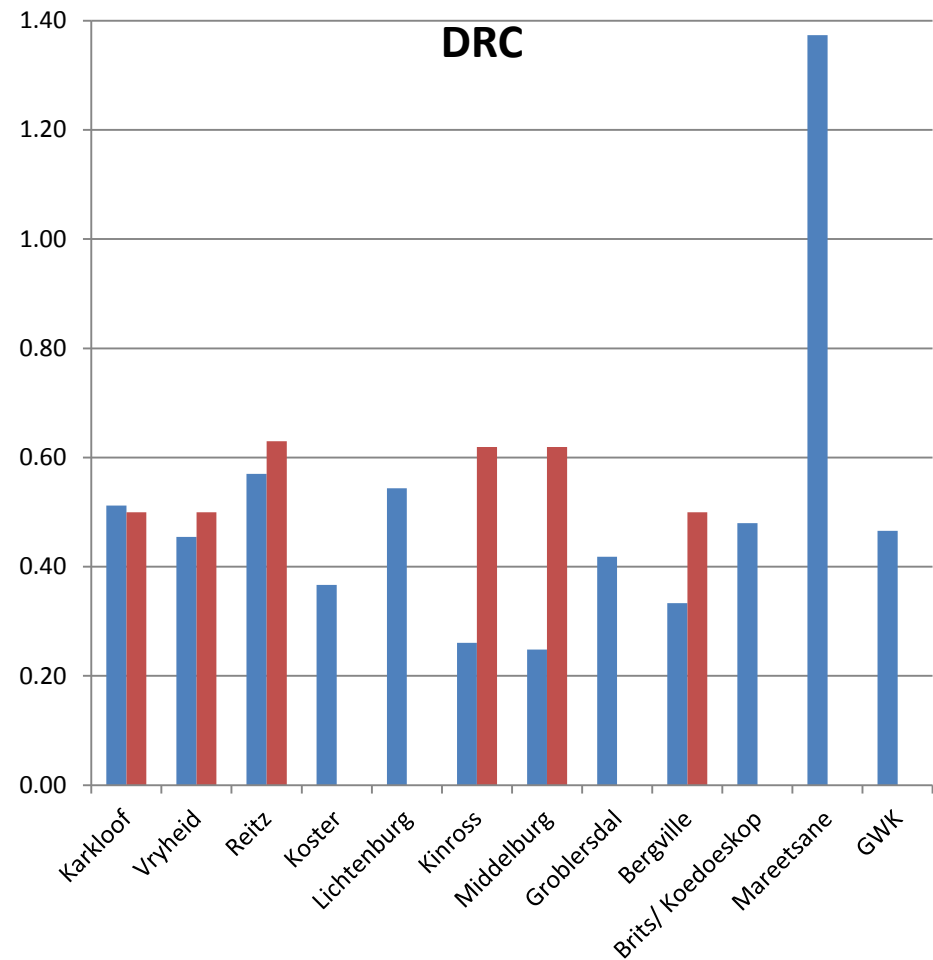
A NPC on inputs shows that policies increase or decrease tradable input cost with a certain % above or below world prices. This means that producers are taxed (if $NPCI > 1$) on tradable inputs or supported (if $NPCI < 1$).



Soybean Study | Results: Domestic Resource Coefficient

$0 < DRC < 1$; there is a comparative advantage.
 $DRC > 1$ = no comparative advantage.
 $DRC < 0$ there is a net loss of foreign exchange and no comparative advantage

- Most effective resource allocation is at Mpumalanga and Bergville area
- Maretsane area did not apply resources effectively in 2011 season



- South Africa have a comparative advantage to produce soybeans in closely all the current production area
- South Africa needs to increase capacity on soybean meal/oil cake processing to become self sufficient in terms of processing
- South Africa needs to develop the human market more effectively.

- National Agricultural Marketing Council (NAMC) & Colleagues
- Protein Research Foundation and the Oil and Protein Seeds Development Trust
- Conference organizer: Paragon Conventions Africa
- World Initiative for Soy in Human Health (WISHH)

