Bureau for Food and Agricultural Policy

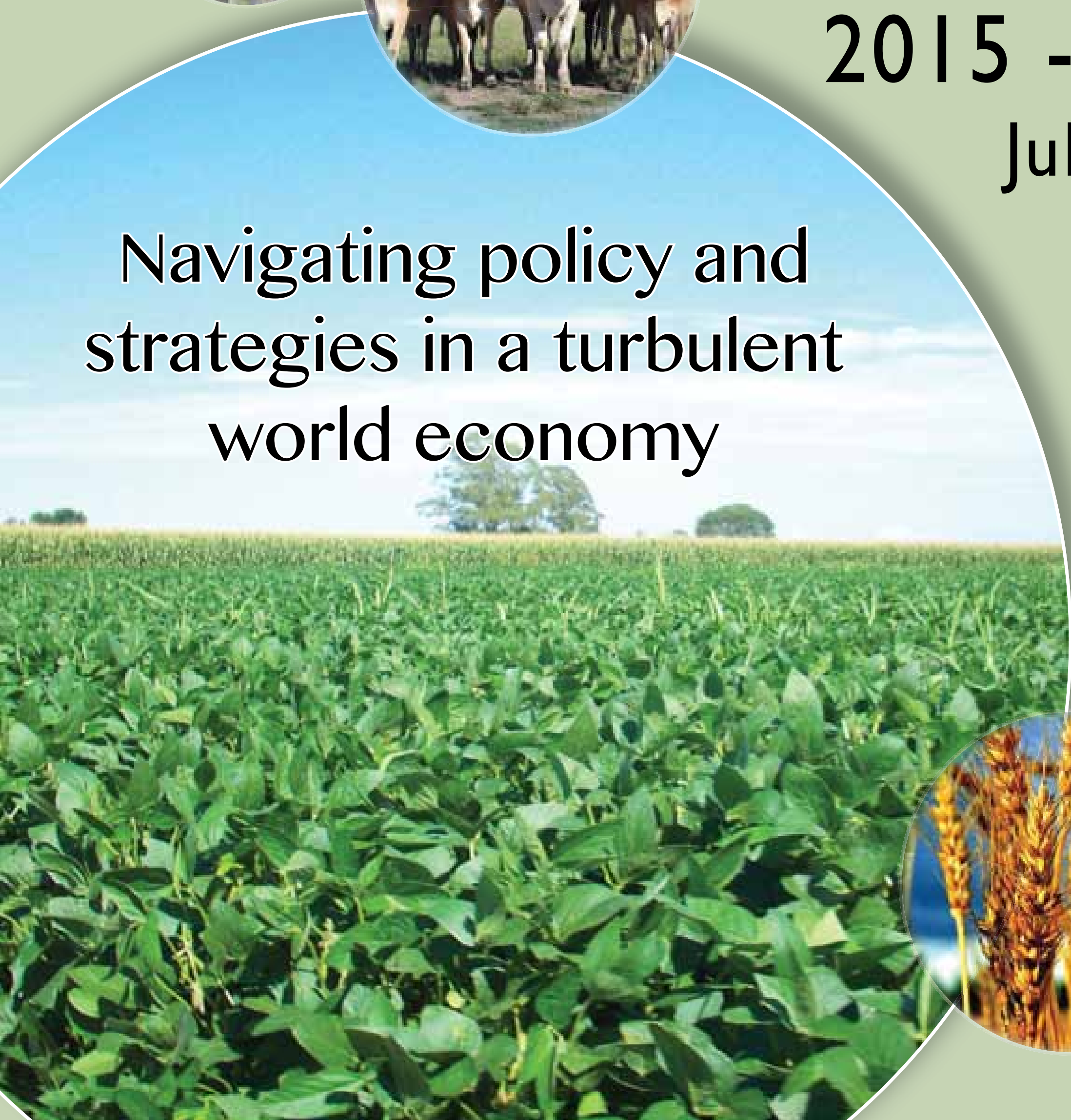
BFAP

BFAP BASELINE

Agricultural Outlook

2015 - 2024

July 2015



Navigating policy and strategies in a turbulent world economy

Bureau for Food and Agricultural Policy

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Agricultural Outlook
2015 - 2024

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FOREWORD

The Bureau for Food and Agricultural Policy (BFAP) is a non-profit company, founded in 2004 with the purpose to inform decision-making by stakeholders in the agro-food, fibre and beverage complex by providing independent research-based policy and market analyses. BFAP has offices at the University of Pretoria, the University of Stellenbosch, and the Western Cape Department of Agriculture and consists of 40 public and private sector analysts and experts who pool their knowledge and research to inform decision-making within South Africa's food and beverage sector. BFAP has become a valuable resource to the agro-industrial complex by providing analyses of future policy and market scenarios and measuring their impact on farm and firm profitability. BFAP collaborates with various international institutions and is a partner in the newly established Regional Network of Agricultural Policy Research Institutes (ReNAPRI) in Eastern and Southern Africa. The Bureau consults to both national and multinational private sector entities as well as to government in all spheres.

BFAP acknowledges and appreciates the tremendous insight of numerous industry specialists over the past years. The financial support from the National Agricultural Marketing Council (NAMC), the Western Cape Department of Agriculture and ABSA Agribusiness towards the development and publishing of this Baseline is also gratefully acknowledged.

Although all industry partners' comments and suggestions are taken into consideration, BFAP's own views are presented in this Baseline publication.

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CONTEXT AND PURPOSE OF THE BASELINE

The 2015 edition of the BFAP Baseline presents an outlook of agricultural production, consumption, prices and trade in South Africa for the period 2015 to 2024 and relates these results to policy and decision making in a turbulent macro-economic environment. The information presented in this publication is based on assumptions about a range of economic, technological, environmental, political, institutional, and social factors. The outlook is generated by the BFAP sector model, an econometric, recursive, partial equilibrium model of the South African agricultural sector. For each commodity, the important components of supply and demand are identified and equilibrium established in each market by means of balance sheet principles where demand equals supply. A number of critical assumptions have to be made for baseline projections. One of the most important of these is that average weather conditions will prevail in Southern Africa and around the world: therefore yields grow constantly over the baseline as technology improves. Assumptions with respect to the outlook of macroeconomic conditions are based on a combination of projections developed by the International Monetary Fund (IMF) and the World Bank. Baseline projections for world commodity markets were generated by FAPRI at the University of Missouri. Once the critical assumptions are captured in the BFAP sector model, the Outlook for all commodities is simulated within a closed system of equations. This implies that, for example, any shocks in the grain sector are transmitted to the livestock sector and vice versa.

This year's baseline takes the latest trends, policies and market information into consideration and is constructed in such a way that the decision maker can form a picture of equilibrium in agricultural markets given the assumptions made. *However, markets are extremely volatile and the probability that future prices will not match baseline projections is therefore high. Given this uncertainty, the baseline projections should be interpreted as one possible scenario that could unfold, where temporary factors (e.g. weather issues) play out over the short run and permanent factors (e.g. biofuels policies) cause structural shifts in agricultural commodity markets over the long run.* The baseline, therefore, serves as a benchmark against which alternative exogenous shocks can be measured and understood. In addition, the baseline serves as an early-warning system to inform role-players in the agricultural industry about the potential effects of long-term structural changes on agricultural commodity markets, such as the impact of a sharp increase in input prices or the impact of improvements in technology on the supply response.

To summarise, the baseline does NOT constitute a forecast, but rather represents a benchmark of what COULD happen under a particular set of assumptions. Inherent uncertainties, including policy changes, weather, and other market variations ensure that the future is highly unlikely to match baseline projections. Recognising this fact, BFAP incorporates scenario planning and risk analyses in the process of attempting to understand the underlying risks and uncertainties of agricultural markets. Some of the boxes in the publication present limited results of various analyses conducted through 2014. In the farm-level chapter of this baseline, scenarios and risk analyses are presented to illustrate the volatile outcome of future projections. Further stochastic (risk) analyses are not published in the baseline, but prepared independently on request for clients. The BFAP Baseline 2015 should be regarded as only one of the tools in the decision-making process of the agricultural sector, and other sources of information, experience, and planning and decision making techniques have to be taken into consideration.

EXECUTIVE SUMMARY AND IMPLICATIONS

The global macroeconomic environment underpinning the outlook for agricultural markets has been characterised by considerable volatility for several years. The impact of the financial crisis remains evident in many countries as high debt levels continue to hamper consumer spending and growth. Whilst global economic growth is expected to strengthen in 2015 and 2016, the projected rate of 3.3% in 2015 remains well below pre-crisis levels and previous expectations. A significant degree of variation is also evident across countries and regions. This follows the slower than expected recovery in the developed world, continued uncertainty in Europe and slowing growth in developing economies, particularly China. Dampened growth, combined with expanded shale oil production, have resulted in a global surplus of oil and the spectacular decline in the price of Brent Crude, resulting in a substantial reallocation of real income from oil exporting to oil importing countries.

In South Africa, the Rand continues depreciate, which supports local commodity prices, particularly in sectors where South Africa is a net importer, but also creates pressure on input costs. While the cost of Brent Crude oil plummeted, the domestic impact was negated to some extent by the depreciation in the Rand, as well as the application of additional fuel levies. Similarly, the generally declining trend in the international fertiliser market since 2011 has not been evident in domestic markets, which moved largely sideways and at times even upwards over the same period. Within this turbulent macro-economic environment, which impacts on commodity prices and the cost of key inputs, severe weather conditions, as well as political and policy influences in agricultural markets have added a great degree of uncertainty going forward.

Globally, record harvests continue to materialise in key production regions and world maize production is set to reach record levels for the 2nd consecutive year in 2014/15 despite a reduction in area planted. Having already plummeted by more than 30% from 2013 highs, maize prices are projected marginally lower again in 2015, inducing a further consolidation of maize area in 2016. In compiling the 2015 baseline, favourable weather conditions were assumed for the 2015 summer crop in the US. However, recent weather forecasts have raised some concerns that excessive rainfall could impact on the crop, which could potentially raise 2016 crop prices above current projections. Nonetheless, global markets remain well stocked and while indications are that yields may not be as far above trend levels as originally expected, the extent to which current weather conditions will reduce the final US crop remains somewhat uncertain at this early stage of the growing season. Global wheat prices also continue to slide in response to bumper crops in South America, the EU and the Black Sea region, resulting in a global surplus. Over the long run, domestic wheat production in South Africa is projected to remain relatively stable around 1.6 million tons with projected yield growth offsetting the declining area. In the face of rising consumption levels, imports will continue to increase, surpassing 2.2 million tons by 2024.

In line with past projections, South African maize area declined marginally in 2015, as the expansion in yellow maize area was insufficient to offset the reduction in white maize plantings. The summer grain producing regions experienced exceptionally challenging weather conditions in 2015, causing yields to fall to decade lows, with the greatest impact in the Free State and North West provinces where more white maize is traditionally produced. Concerns related to domestic supply, combined with limited surplus markets for potential white maize imports have pushed prices up sharply, whilst ample supplies in the global market prevented yellow maize prices from increasing to the same extent. Consequently, white maize is trading at a substantial premium to yellow maize. While considerable growth is projected in the animal feed sector which traditionally relies on yellow maize, the market for human consumption remains stagnant over the Outlook period and the premium is not projected to remain in the longer term, resulting in a continuation of the declining trend in white maize plantings. Nevertheless, a return to normal weather conditions will see South Africa remaining a net exporter, as growth in yields is expected to be sufficient to ensure ample supply for human consumption. Over the Outlook period, the total area under maize is projected to settle around 2.2 million hectares.

Vegetable oil prices have been on a declining trend for the past 5 years and following the sharp decline in crude oil prices, have found little support on the demand side. In contrast, firm demand for animal feed has supported protein meal prices and given its favourable input cost structure relative to other summer crops, soya beans have continued to expand its share of the global oilseed complex. Domestically, soya bean area has also expanded rapidly and despite the drought conditions in 2015, South Africa is expected to harvest a record soya bean crop of just over 1 million tons. Further area expansion is projected in 2016 and a return to trend yields would result in a crop of more than 1.2 million tons. By 2024, production is projected to surpass 2.1 million tons. Canola has also moved sharply in recent years and over the Outlook the area under canola is projected to expand by 70% from 2014 levels, reaching 160 thousand hectares by 2024. In contrast, the fine balance in the domestic sunflower market will be maintained over the Outlook and, given ample domestic crushing capacity, South Africa is projected to maintain a small net importing position.

Following several years of exceptional profitability in field crop production, accompanied by tight margins in the livestock sector as a result of the high and volatile feed grain prices, the commodity cycle became favourable for livestock production globally in 2014. Demand for meat continues to expand, whilst a combination of reduced profitability, drought conditions and disease in key markets reduced livestock numbers. Increasing supply has been evident in sectors such as poultry that are characterised by short production cycles, yet beef prices remain at record levels due to the time required for production herd expansion. South Africa remains a net importer of meat products and, combined with firm prices globally, the depreciation in the value of the Rand has supported meat prices to date. However, contrary to the global scenario, South African producers faced higher feed grain prices due to the effects of the drought in early 2015. Hence slaughter numbers remain high, indicating that producers have yet to enter a phase of herd rebuilding. Over the course of the baseline projection, continuous depreciation in the exchange rate will support import parity based prices, aiding competitiveness in the global context. Furthermore, a return to normal weather conditions will result in more favourable meat to feed price ratios relative to the past few years and profitability in the livestock sector will improve, allowing domestic production to expand.

Continued currency depreciation over the Outlook period will also support the competitiveness of export orientated industries. The horticultural sector produced 6 of the top 8 exported items in 2014, with the value of citrus and grape exports in particular expanding strongly from 2013 levels. Whilst the performance of pome fruit and wine was less spectacular, both these sectors had attained record exports in 2013 and relative to historic norms, still performed well in 2014. Given the expectation of increased primary food imports, continued expansion in these export orientated industries is crucial for the retention of South Africa's positive agricultural trade balance. Within the context of the National Development Plan, these industries have a significant role to play due to their labour intensive nature. However, significant investment in infrastructure is required to increase the availability of water for expansion in irrigation. Labour costs are also a key aspect that will impact on international competitiveness and while the wage rate for hired labour on South African farms is considerably lower than in Europe, labour productivity measured as the value of output relative to labour hours employed is considerably lower. If wage rates are to increase, commensurate gains in productivity will be required in order to remain competitive in the international market.

In summary, the return to favourable weather conditions globally, combined with the sharp decline in fossil fuel prices has induced a cycle of lower agricultural commodity prices. Whilst favourable for livestock production, the cycle implies tighter margins in the field crop sector, which is projected to continue in the short term. Compared to leading global producers, the cost of producing maize under dryland conditions in South Africa is significantly higher, with the comparatively high cost of fertiliser in South Africa accounting for a substantial share of this difference. South Africa remains a net importer of fertiliser and hence the exchange rate, deep sea freight rates, unloading- and administrative cost at ports and inland transportation are all contributing factors that drive the cost of fertiliser higher.

Within the lower price cycle, management of the cost squeeze effect will be critical in order to remain sustainable. This will entail continuous improvements in productivity to ensure favourable returns. Within this context, commercially oriented small scale production that does not benefit from economies of scale becomes exceptionally challenging. Therefore, commercial small scale producers will have to be supported correctly to ensure competitiveness and sustainability. Even with scale advantages, the projected returns from field crop production in the short term remain significantly below the levels attained over the past few years and compared to inflation, as well as alternative investment opportunities, such returns are unlikely to attract large numbers of new investors into agriculture. This will likely result in further consolidation of farms and more stagnant land prices relative to the past 5 years. Such commodity cycles have also been evident in the past however, and following the projected recovery in prices from 2017 onwards, the prospects for more favourable returns in the field crop sector do improve. Given the expected currency devaluation, the Outlook for livestock and horticultural production remains favourable; however the reduced currency value also impacts on the cost of key inputs and consequently, continuous gains in productivity remain crucial for the entire agricultural sector going forward.

From the consumers perspective, the cost of an affordable healthy eating plan for a family of four (2 adults and 2 children) increased by 36% from January 2011 to April 2015. The cost of healthy eating has therefore increased at a faster rate than general inflation in South Africa, with the CPI headline index reflecting an increase of 27% over the same period. A cycle of lower commodity prices could potentially improve the outlook for food prices in the short term; however, because substantial value is added to primary agricultural commodities before it is delivered to the consumer, cost efficient value chains remains key in ensuring that consumers in fact have access to affordable food products. Furthermore, a significant portion of the food represented in a typical food basket is imported and therefore influenced by the depreciation of the currency, which will inevitably drive food price inflation higher. As indicated in the opening paragraphs, the cycle of lower commodity prices also coincides with a period of lower economic growth, which will influence the rate of increase in the demand for food.

OVERVIEW

International overview

Growth and the global recovery

Global economic growth is expected to strengthen during the course of 2015 and 2016 but will remain well below the pre-crisis levels. Moderate global growth of 3.3% is expected for 2015 following a second downward adjustment by the IMF in July, the October 2014 and February 2015 projections anticipated a growth rate of 3.8% and 3.5% respectively. Growth expectations also show a high degree of variation across countries and regions as illustrated in Figure 1.1. Relative to 2014, the growth prospects for advanced economies is improving but the same cannot be said for developing economies due to the weaker prospects for some of the major emerging economies and oil exporting countries. Growth in these economies, albeit slower, will contribute 70% of the global expansion in 2015 (IMF, 2015). It should also be noted that a number of African economies are expected to expand at a faster rate per year than both China and India over the next decade (Figure 1.1). The slower growth outlook for the Chinese economy is significant given its size and impact during the last ten years. The current outlook is driven by the policy shift from an export driven to domestic consumption driven growth model. The extent to which Chinese growth will slow remains somewhat uncertain given the lack of consensus in projections from different international institutions. Furthermore the growth rates should be interpreted in context of the base; given the relative size of the economies in Sub-Saharan Africa and China - if the Chinese economy grows at an annual average rate of 7%, it adds to itself an economy the size of sub-Saharan Africa every 32 months.

The outlook presented in Figure 1.1 is influenced by a number of complex forces that shape the global economy over the short- and medium term. Two major factors dominate the medium- to long term outlook: Firstly, the impact of the financial and euro area crisis that is still visible in many countries. One of the legacies is weaker banks and high levels of debt (public, corporate and household), which continues to put consumer spending and growth under pressure. The current low growth levels are also slowing the repayment of debts. Secondly, the declining output growth potential that started to emerge before the financial crisis due to ageing populations, low investment and slowdown in total factor productivity was intensified by the crisis. While investment can recover, the adverse effects of ageing populations and slower total productivity growth will

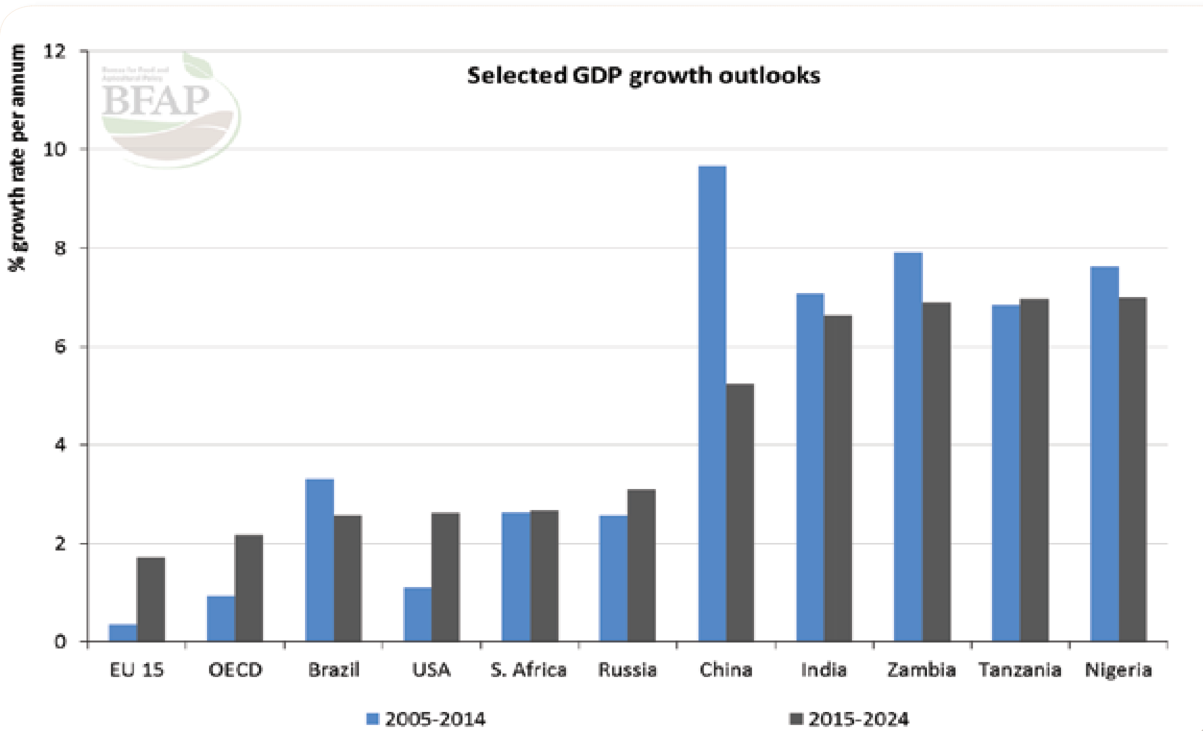


Figure 1.1: *Selected growth outlooks 2005-2014 vs 2015-2024*
Source: OECD (2015), IMF (2015) and related authorities

continue. The expectation of low growth is also discouraging investment.

Currently two prominent short term trends are playing themselves out on top of the medium to long term trends in the form of oil price and exchange rate movements. The sharp decline in the oil price is mainly the result of a global over supply and has resulted in a large reallocation of real income from oil exporting to oil importing countries. This could result in rising consumption expenditure that would stimulate growth, but all consumers may not necessarily see the benefits.

In terms of exchange rates, this year saw unusually large movements, with a major appreciation of the dollar and depreciation of the euro and the yen. This reflects differences in monetary policy, with the US expected to start raising interest rates in the near future in response to the growth in their economy. The variations in country growth rates and oil price movements are also impacting on global currencies. Weaker exchange rates are offsetting the adverse effects of the fall in oil prices on exporting countries. Even in Europe and Japan, the weaker exchange rates are fending off deflation risks. Increases in US rates will necessitate a similar response in developing markets such as our own in order to defend their local currency through the retention of foreign capital.

Oil prices

The dramatic decline in oil prices since 2014 has been the subject of widespread reporting and analysis. Whilst relevant, the lesser reported fact is that it simply joined the declining trend in motion since 2011 of other commodities as illustrated in Figure 1.2. The decline in the prices of agricultural products, for example, has been so substantial that the FAO Food Price Index in June 2015 was at its lowest level since September 2009.

The spectacular decline in the oil price since mid-2014 is simply the result of an oversupply on the world market. Global supply has outpaced global demand since the first quarter of 2014, resulting in a rise in stocks (Figure 1.3) to the extent that the US recorded its highest stock levels in 85 years. The current oversupply is projected to continue for the rest of 2015 and 2016 due to a number of structural factors within the global market that can be summarised as follows:

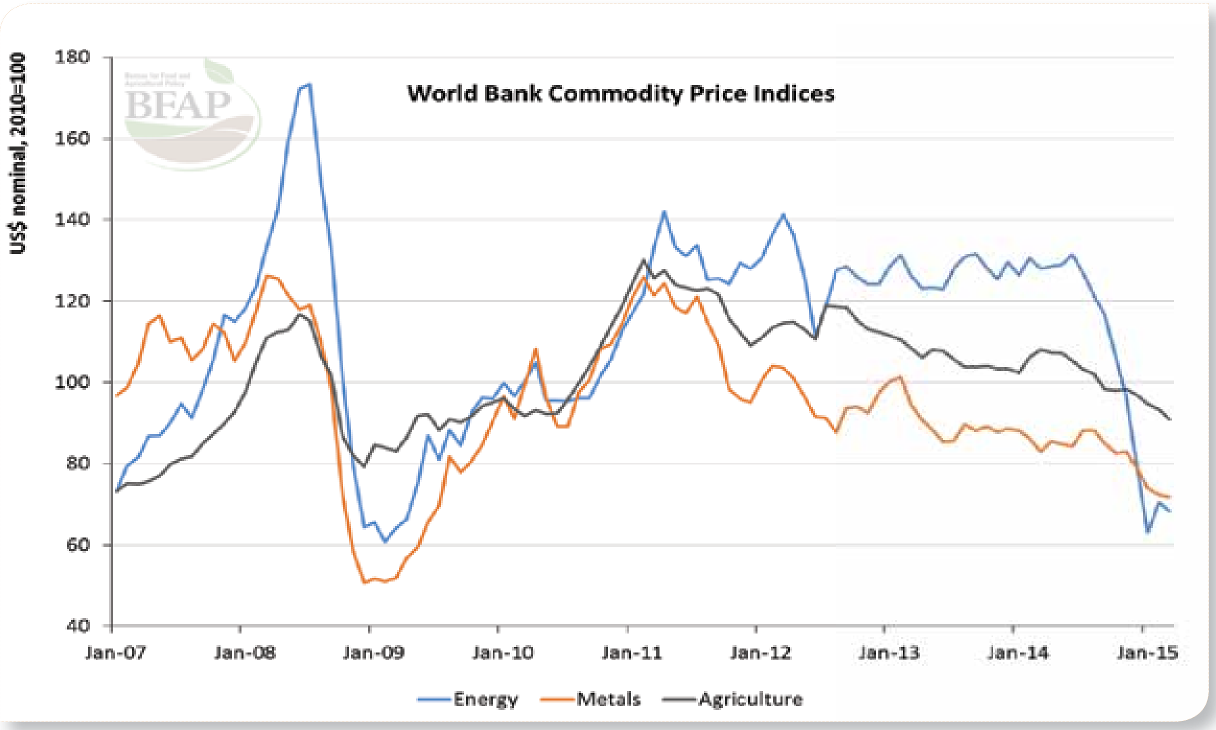


Figure 1.2: *World Bank commodity price indices (2007-2015)*
Source: World Bank (2015)

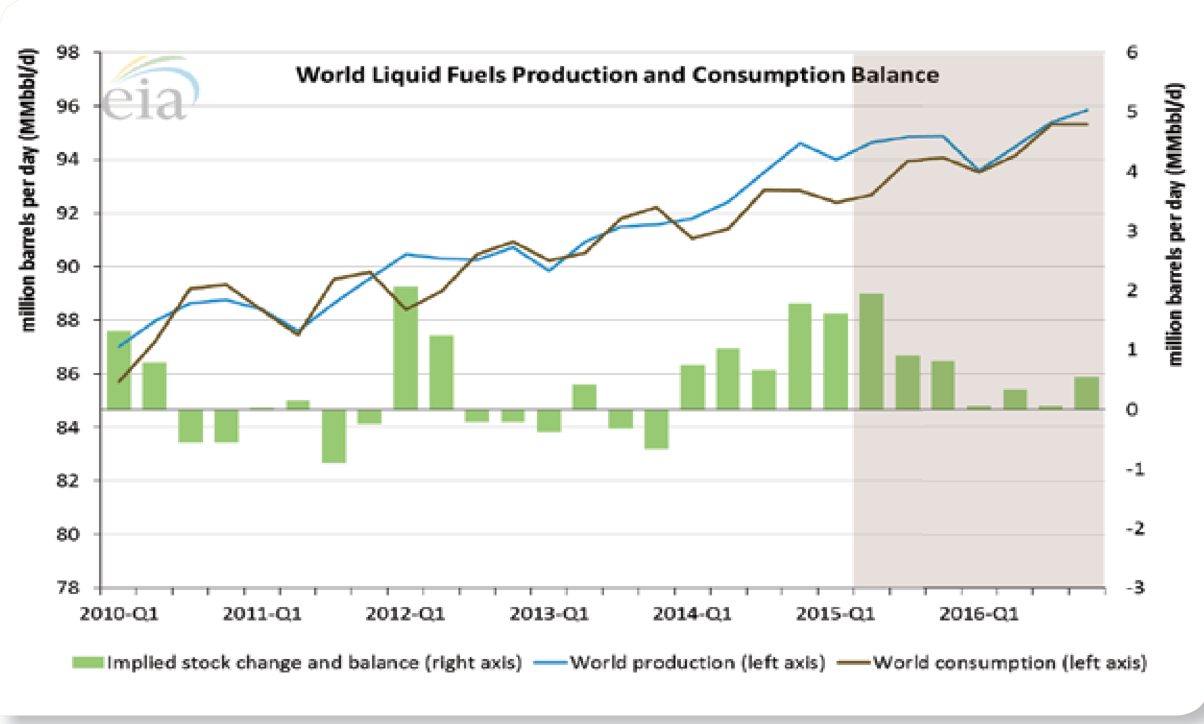


Figure 1.3: *World Liquid Fuels Production and Consumption Balance*
Source: EIA (2015)

Economic growth and a changing energy composition: Slower than expected global growth is a major contributing factor to the oversupply. The link between growth and the demand for oil is also becoming weaker given the reorganisation of the global energy landscape. In 1973 for example, oil provided 43% of the world's energy but only 31% in 2012. This is partially due to the rise of renewables, the abundance of natural gas in the US and a negative expected growth in demand for petrol in many developed countries as a result of rising fuel efficiency.

The US shale boom: The development of the US shale oil and gas industry has increased oil output by 70% in the last six years, with the US surpassing Saudi Arabia as the world's biggest oil producer in the process. This follows technological advances in hydraulic fracturing together with improved horizontal and directional drilling systems. The US added 1.5 million barrels per day of supply in 2014, a trend that is projected to continue albeit at a slower rate: an additional one million barrels is expected to be added in 2015 and a further 0.6 million in 2016 (EIA, 2015). The extraction of shale oil requires continued drilling in order to sustain production and hence low prices could slow or even reverse the trend in US output. The number of active US oil rigs serves as an important supply indicator. The number of active units has shown a decline of more than 40% since its high before the price decline but it seems that this is not having an immediate supply effect since current wells will remain active for two to three more years whilst drillers are simply retiring older, less efficient rigs.

The decline of OPEC: OPEC currently commands about 40% of global production and 60% of world trade. Traditionally OPEC, with Saudi Arabia as the biggest producer, has manipulated the world oil price through the management of output levels. The rise of non-traditional producers such as the US and Canada has changed this dynamic to the point where a change in output by OPEC would support prices but at the expense of market share from competing producers. As a result Saudi Arabia consistently indicates that they will maintain output in order to defend market share and put non-traditional producers under pressure, despite calls from some OPEC partners to curb supply.

Geopolitics: Oil has a low elasticity of demand, hence a small supply disruption in politically turbulent countries such as Libya, Iran, Yemen, South Sudan and others used to have a major impact on price. Whilst supply from these countries remains above expectation, their cumulative impact on price has diminished and the turmoil in Syria and Iraq has a limited effect on prices. The major shift in this regard is the rise in US production given that it is roughly equal to the combined output of these swing producers. Going forward, greater stability in these regions could put prices under pressure even further. Iran for example could increase output by an additional million barrels if sanctions are lifted.

In summary these factors have resulted in structural shift in the oil market as illustrated in Figure 1.4. Going forward this translates to an expected average Brent crude price of $64 per barrel in 2015, $68 in 2016 and a slow recovery towards $115 by 2024.

Ethanol

About 40% of coarse grains (all grains except wheat and rice, mostly maize) produced in the US between 2004 and 2014 was used in the production of ethanol. Ethanol use in the U.S. has stabilised at the mandated level, which is currently being set by the Environmental Protection Agency at the so called "blend wall". Not all engines are approved for concentrations of

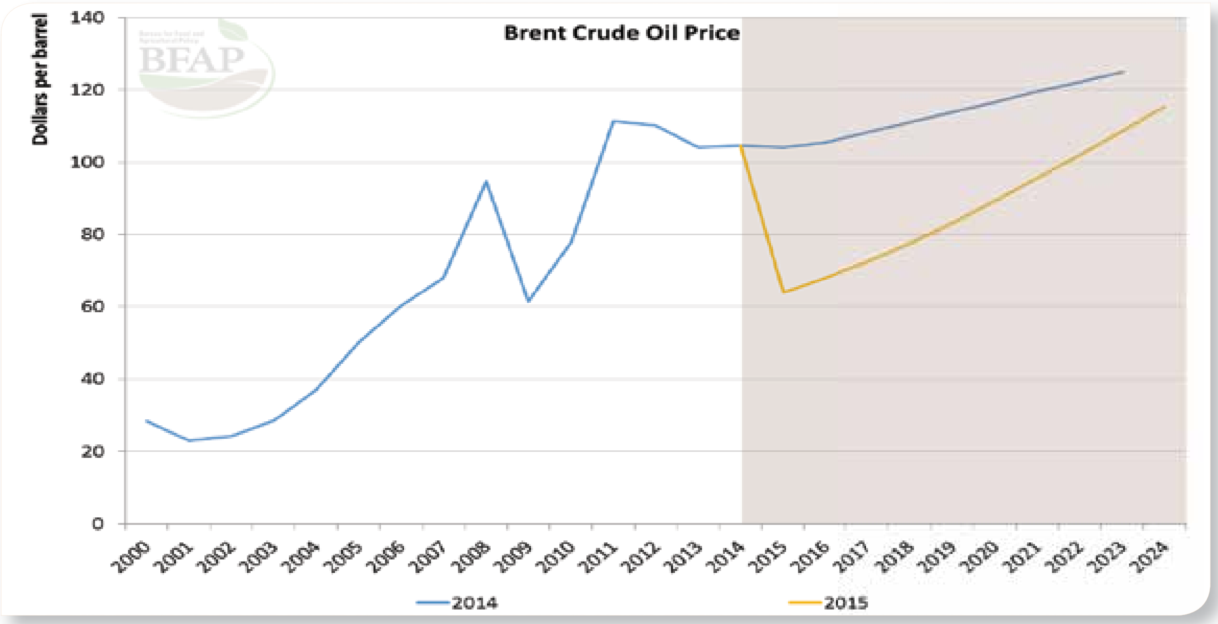


Figure 1.4: *Oil price assumption: 2014 vs. 2015*

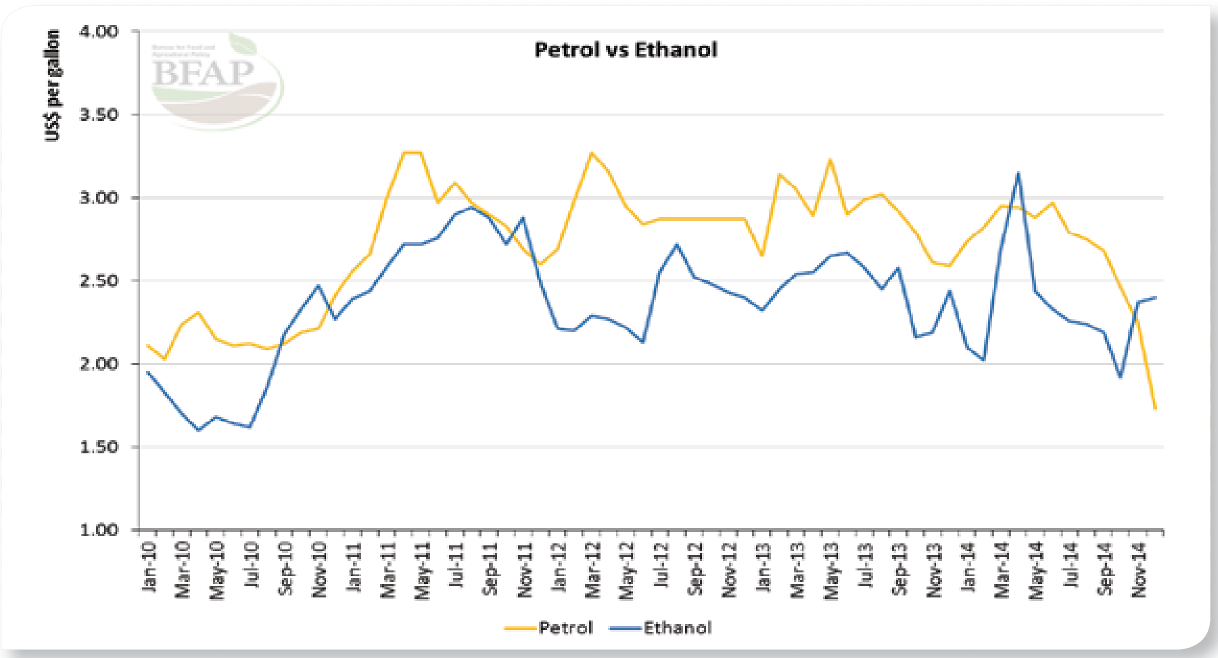


Figure 1.5: *Ethanol vs Petrol prices.*
Source: EIA (2015)

ethanol greater than 10%, which results in a "blend wall" in the US given the limited fleet size of "flex fuel" vehicles and a small number of pumps that can dispense 15% blends. The fall of the oil price has also reduced the incentive to make the necessary investments in pump capacity and high ethanol blend vehicles. Hence it is likely that in the near future, ethanol consumption in the US will remain close to the 10% level.

These structural properties result in a situation where ethanol and petrol act as complementary products when the market is operating at mandated levels, and substitutes when market conditions result in consumption above mandated levels. Lower oil prices increase gasoline use and therefore the demand for ethanol. However, decreasing long term demand for petrol in the US (due to tougher vehicle efficiency standards) will also drive ethanol demand downwards, Depending on world energy markets this could be offset by increased ethanol exports. Altogether, ethanol production in the United States is projected to increase modestly over the next ten years from 57.2 billion litres in 2014 to 59.3 billion litres by 2024, whilst global production is expected to increase from 63 to 65 billion litres during the same period (Figure 1.6) (OECD, 2015). Ethanol production will therefore have a limited impact on the coarse grain market going forward given current policy regimes, its impact on consumption patterns and relative prices will also be limited.

Coarse grains aside, two additional movements in the ethanol market require attention. The first is a projected increase in ethanol production from wheat: the OECD (2015) projects that, from current production of 2.5 billion litres, ethanol production from wheat will peak at 3.5 billion litres in 2019 before declining to around 3 billion litres towards 2024 in response to mandates (Figure 1.6). The European Commission (2015) further reports that the expected demand growth for wheat will be met through increased production, at the expense of oil seed hectares.

The second is the increase in ethanol production from sugarcane in Brazil, which is projected to increase by 50%, from 28 billion litres to 43 billion litres towards 2024. This is in response to the 27% blending requirement in gasohol. Ethanol consumption and production in Brazil will depend on how the government balances support of the sugar and ethanol sector with the desire to meet inflation objectives through the manipulation of fuel prices. The government's choices will have significant implications for global sugar markets, as well as those for ethanol.

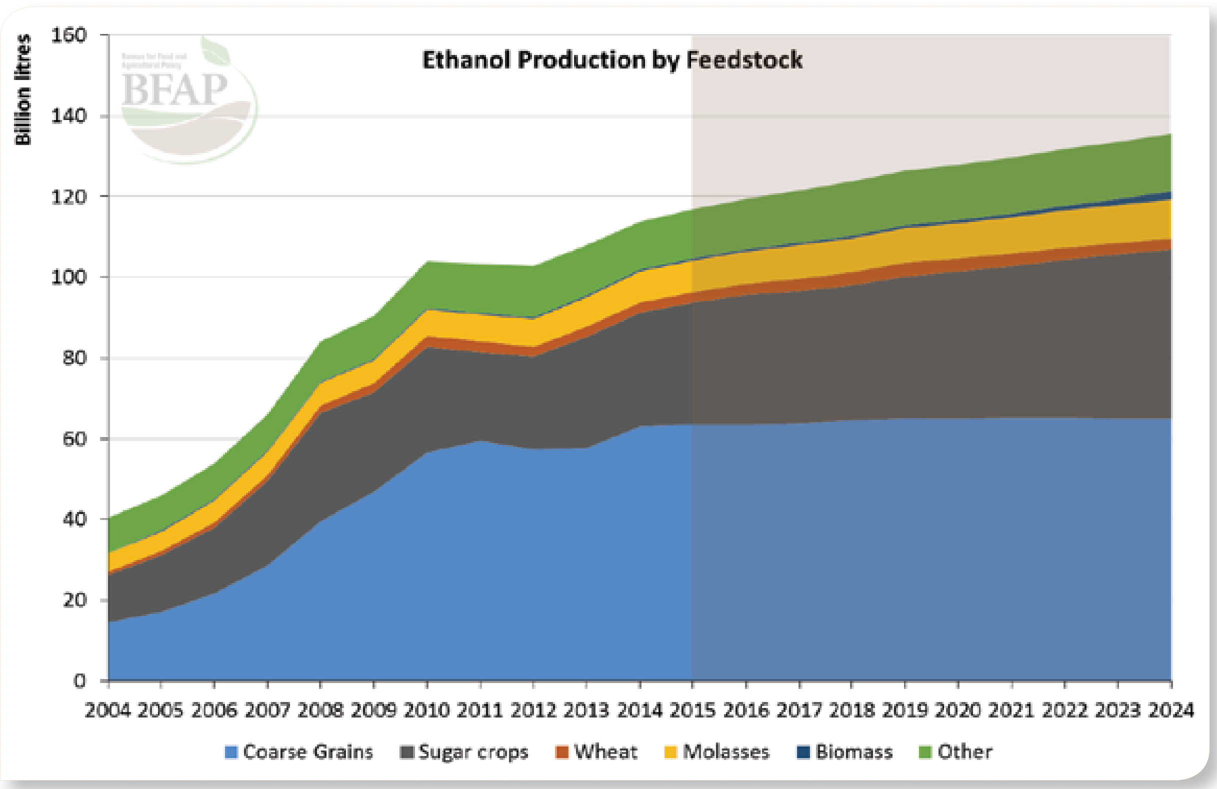


Figure 1.6: *Ethanol production by feedstock*
Source: OECD (2015)

Input costs

Oil and gas prices are important drivers of agricultural input costs, since their derivatives in the form of fertiliser, fuel and pesticides represent up to 65% of the total variable costs in field crop production. The recent developments in the oil and gas market have therefore helped input prices lower, but given the expectation of higher oil prices, albeit lower than previous projections, will drive fertiliser prices higher going forward (Figure 1.7).

Domestic overview

Macro-economic drivers

The South African economy is forecasted to expand by a mere 2% in 2015, reflecting the impact of unemployment, industrial action and challenges in energy supply. Over the longer term, the IMF (2015) projects that growth will accelerate to 3.5%. Towards 2024, the exchange rate is expected to continue its decline towards R15.80 to the dollar. Over the same period, the South African population is expected to expand from current levels of just over 54 million to almost 58 million.

South Africa remains a net importer of major food items such as wheat, rice, vegetable oils and palm oil. Hence, the depreciation of the exchange rate has a direct impact on import parity prices and thus also the affordability of these food items for poor consumers. This is not an uncommon scenario in developing economies. If the economy is growing strongly and jobs are created, the impact of food inflation can be absorbed by a large share of the population. Over the past decade South Africa has managed to maintain a positive class mobility rate by reducing the share of the population in the lower income categories significantly, moving them into a higher income bracket. This has resulted in a sharp rise in the demand for food, especially animal proteins such as chicken meat. Over the outlook period however, this trend slows, as the dampened economic growth rate has already taken its toll on the class mobility rates and the rate at which consumers are shifting to higher income categories has been reduced.

The fundamental macro-economic drivers therefore dictate that food demand over the next decade will in general not increase at the same rate as the past ten years. This will have a trickledown effect throughout the food system right to the farmer, where profit margins will be tighter and the environment will become more competitive.

Net farm income

Looking back, 2014 was an exceptional year for the agricultural sector with the highest ever real net farm income recorded in

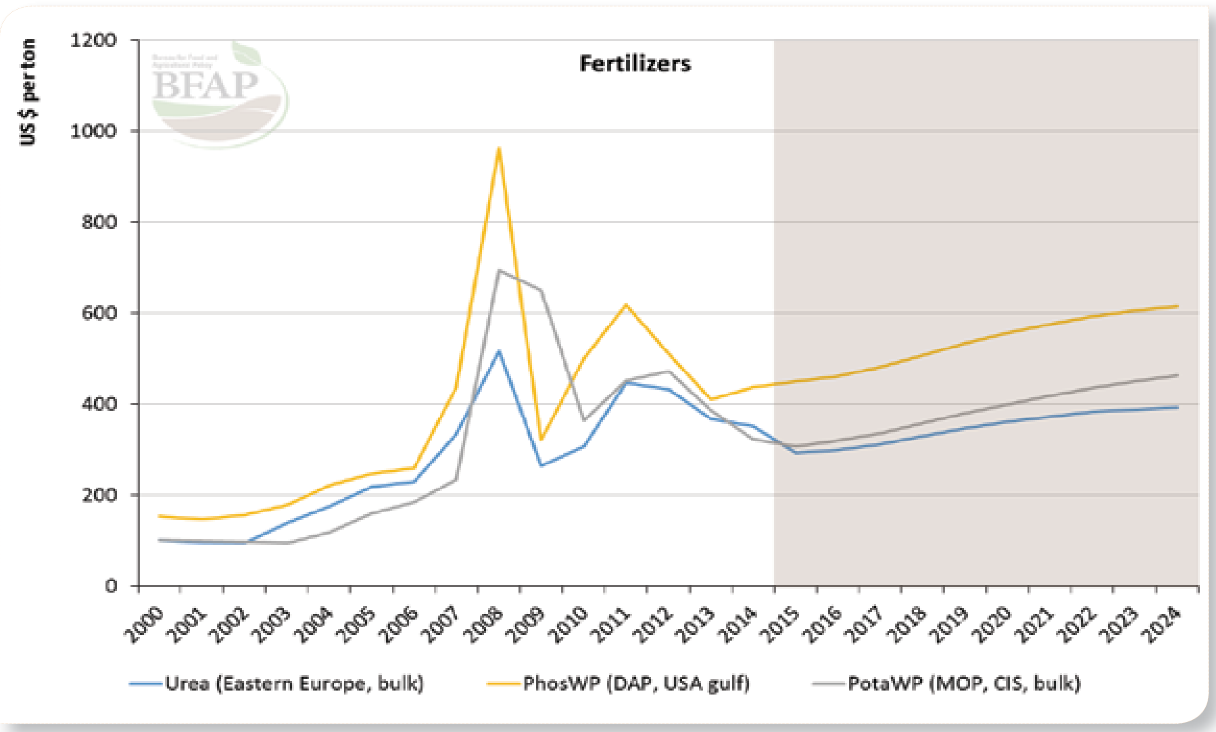


Figure 1.7: Historic and projected fertiliser prices (2000 to 2024)

that year, as shown in Figure 1.8. Looking ahead, the outlook for the field crop sector is less optimistic over the short term given the continued decline in commodity prices following record harvests and high stock levels globally. Due to the summer drought in 2015, the South African harvest was smaller than expected and while prices did increase in response, reduced quantities resulted in a substantial decline in gross income from field crops. At a national level, gross income from total agriculture suffered as a result and in real terms, net farm income is projected to decline by 16% in 2015. Assuming normal conditions, real net farm income remains under pressure in the near term; while some recovery is evident in 2016 due to improved production volumes, stagnant commodity prices and the reversal of the declining trend in input costs will continue to put margins under pressure. The outlook for animal production is more positive given the favourable feed prices and continued increase in per capita protein (mainly chicken) consumption. The same can be said for the horticultural sector given the continued depreciation in the value of the Rand, which will offer some support to domestic price levels and the expectation of increased export volumes. Real net farm income is anticipated to recover, increasing gradually from 2017 towards 2024, where the highs of 2014 will again be matched (Figure 1.8).

Field crops

The area planted to yellow maize is expected to exceed that of white maize by 2021 given current consumption patterns that result in flat demand for white maize in the food consumption market, compared to the continued growth in demand for animal feed and constant yield increases. The area under sunflower is projected to be stable and the same can be said for wheat production in the summer production area following a protracted decline in recent years. 2015 saw a substantial increase in the area planted to soybeans, surpassing 600 thousand hectares. This trend is expected to continue, with total area planted levelling off at a million hectares, or roughly a third of total maize production. A rapid expansion in the area under canola in the Western Cape is also expected, with the total area reaching 160 thousand hectares by 2024. The expansion in canola production will not come entirely at the expense of the area grown under winter wheat, but also from a net expansion of approximately 30 thousand hectares in the total crop area in the Western Cape. (Figure 1.9)

Animal production

In light of continuous growth in income levels and the associated class mobility of South African consumers, the demand for meat products has expanded rapidly over the past decade. As the cheapest and most accessible source of protein, chicken has dominated this growth. While the rate of consumption growth over the next decade is projected to slow, it is still significant over the next 10 years. Following several years of tight margins

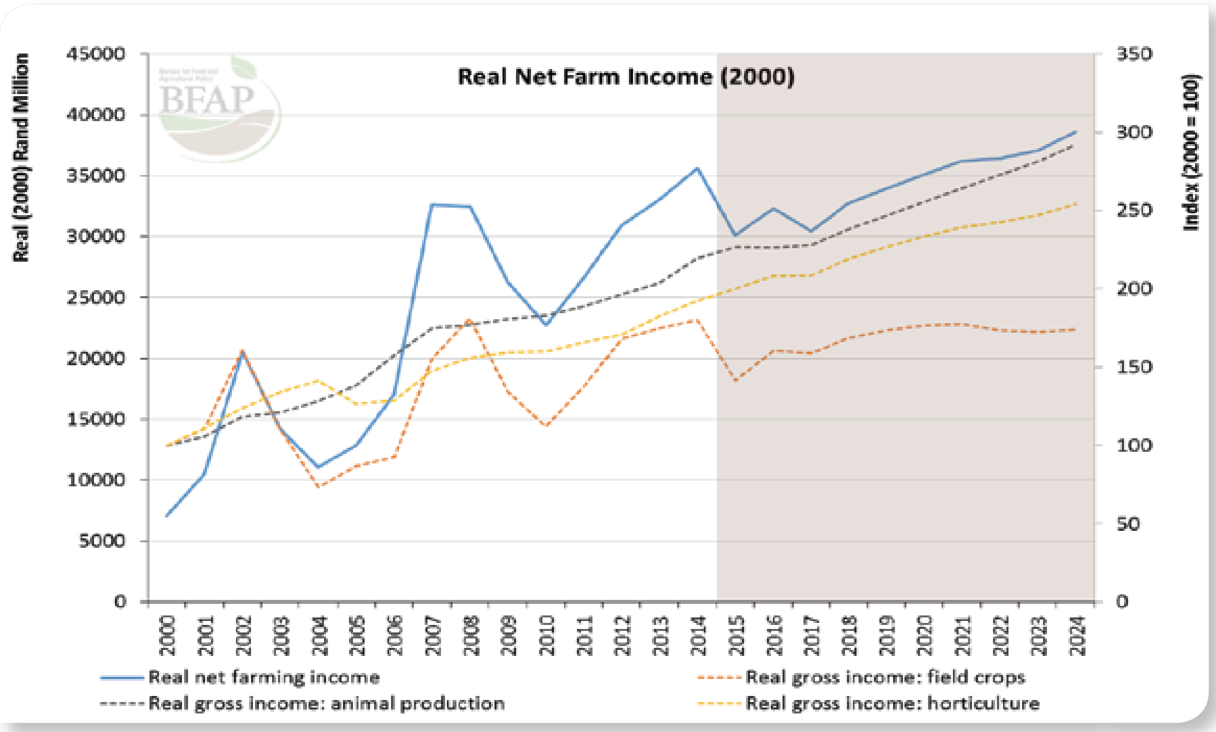


Figure 1.8: *Historic and projected Real Net Farm Income (2000 to 2024)*
Source: South African Department of Agriculture, Forestry and Fisheries - Directorate of Agricultural Statistics (2013)

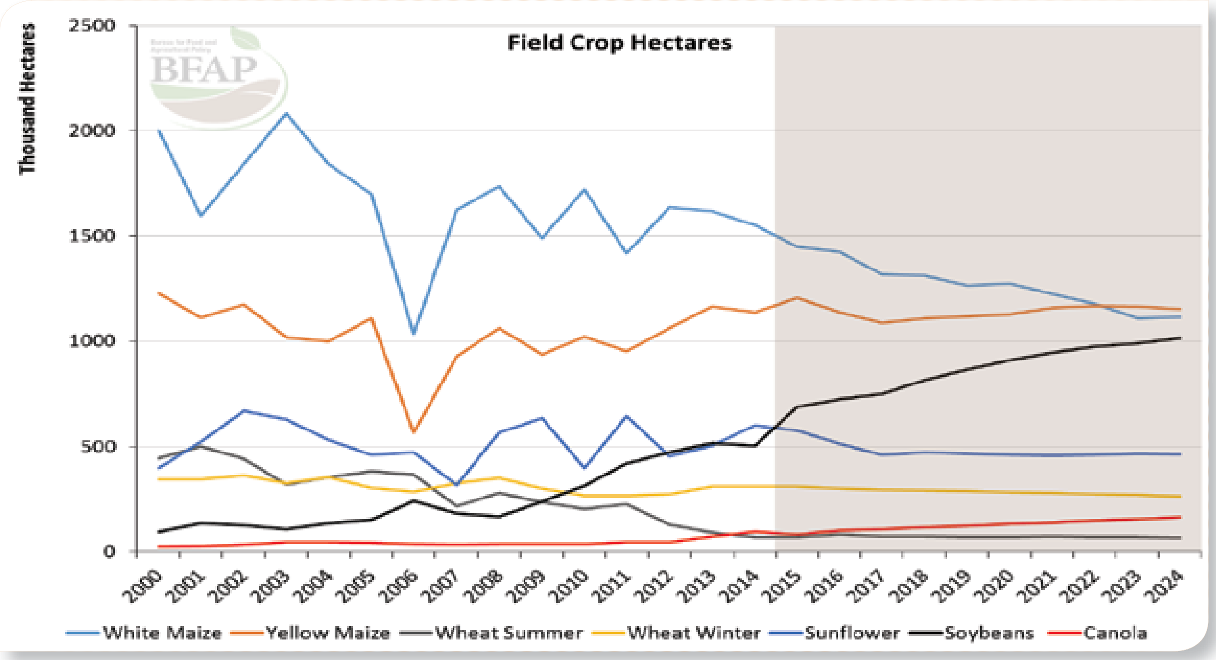


Figure 1.9 : *Area under field crops: 2000 – 2024*

due to high and volatile feed grain prices, the commodity cycle became favourable for livestock production globally in 2014. By contrast, South African producers faced higher feed grain prices due to the effects of the drought in early 2015. Furthermore, South Africa remains a net importer of meat products and over the course of the baseline projection, continuous depreciation in the exchange rate will support import parity based prices, aiding competitiveness in the global context. Consequently, the share of imported products in total meat consumption declines for all meat types except for poultry, where inherent differences in the demand for various cuts in the global market impacts negatively on South Africa's competitive position. While total production is projected to expand considerably over the next decade, the absolute volume, as well as the share of imports in total consumption continues to rise (Figure 1.10).

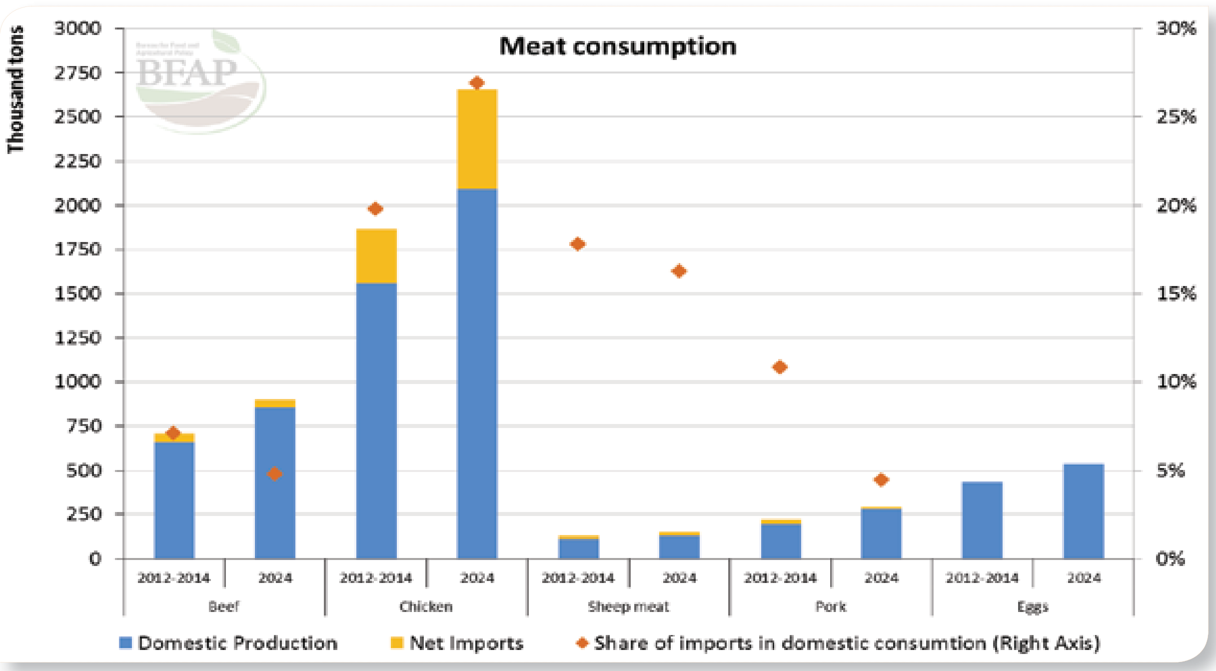


Figure 1.10: *Protein consumption in South Africa (2024 vs. 2012-2014)*

Horticulture

Horticultural production constitutes 25% of total agricultural production by value but serves as the primary earner of foreign exchange since it produced 6 of the top 8 exported items in 2014. These exports showed strong growth in 2013, with citrus and table grape exports increasing by more than 25%, fruit juices by 36% and nuts by 50%, albeit from a lower base. The performance of wine and pome fruit exports was less spectacular. A continued expansion in these exports is crucial for the retention of the positive agricultural trade balance given the expectation of increased primary food imports. The outlook for the sector is positive given the expectation of a continued decline in the exchange rate and increase in volumes. Producers will however have to adapt to changing market destinations and preferences as highlighted in the section that follows.

Trade performance

Figure 1.11 depicts the net trade of South African agricultural products[1] with selected regions[2] since 2001. During 2014 South Africa remained a net exporter of agricultural products, and the value of net exports grew by 30% to reach R35 billion. Exports increased by 12.3% to reach approximately R104 billion during 2014, with Africa[3], the EU and Asia being the main export destinations and drivers of export growth. Exports to Africa (+29% for food preparations, +11% for maize, +24% for fruit juices), the EU (+32% for grapes, +12% for citrus fruit), and Asia (+45% for citrus fruit, +71% for nuts, +82% for sugar) grew by 14%, 8% and 20% respectively.

Imports increased by 4.8% to reach approximately R67.9 billion during 2014, with imports mainly originating from the EU, Asia and the Americas. Imports from the EU (+31% for poultry meat, +54% for sunflower oil, +279%[4] for wheat) and Asia (+27% for palm oil, +54% for coconut oil, +37% for raw tobacco) grew by 22% and 2% respectively, while imports from the Americas (-13% for oil-cake, -20% for poultry meat, -52% for sugar) declined by 21%.

Looking more closely at South Africa's agricultural exports to Africa, Figure 1.12 indicates that 71% of these agricultural exports went to neighbouring countries. The share of exports destined for other African markets did however increase from 26% to 29% between 2010 and 2014.

Figure 1.13 shows how the value of South Africa's trade has changed per agricultural product between 2013 and 2014.

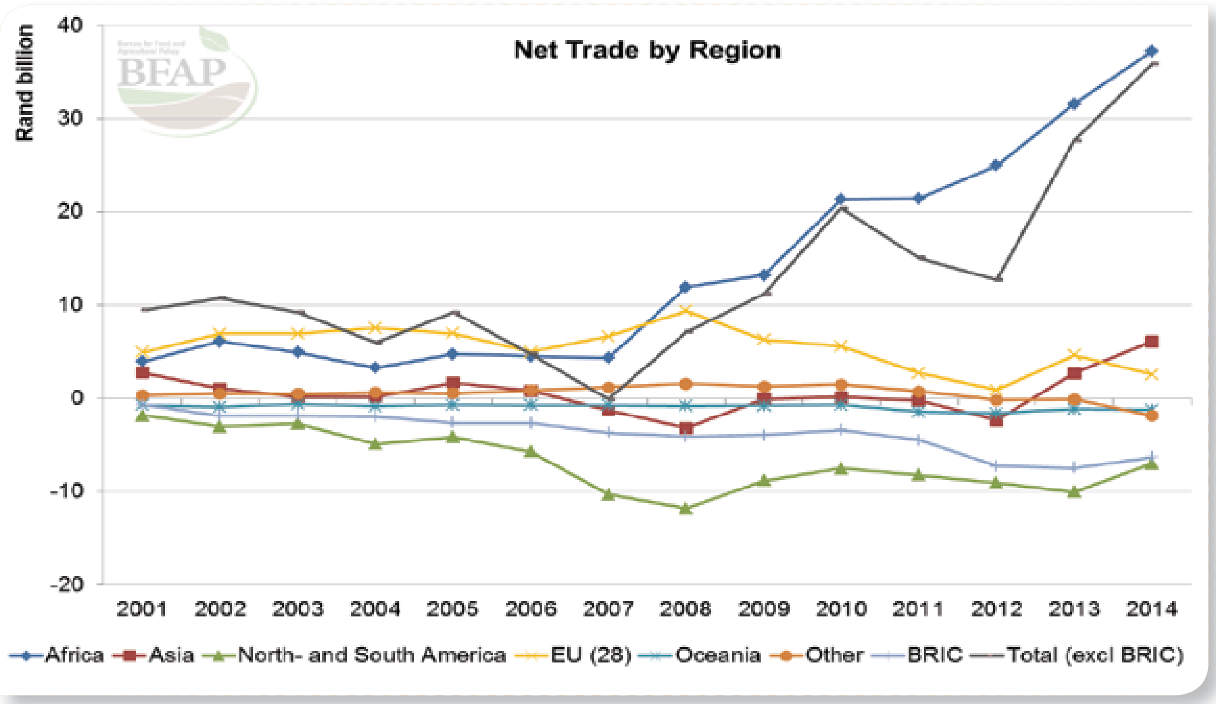


Figure 1.11: *Net Trade of South African Agricultural Exports by Region*
Source: ITC Trade Map

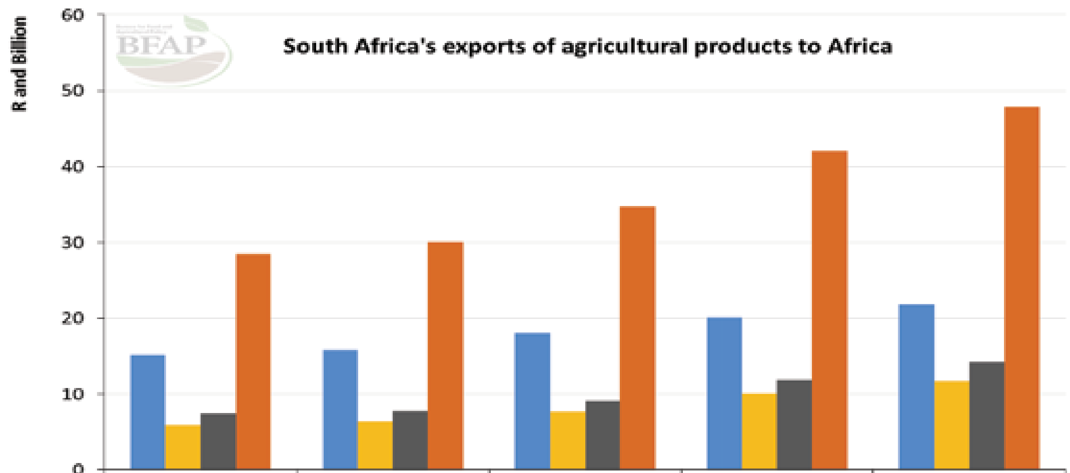
[1] Agricultural trade figures include products as defined in Annex 1 of the WTO's Uruguay Agreement on Agriculture

[2] Africa, Asia, America, EU 27 and Oceania are as defined by Trade Map, and 'Other' includes all other export destinations, including Russia.

[3] Prior to 2010, South Africa did not report its trade with SACU partners. However those SACU countries which reported, always reported their trade with South Africa. Researchers and other users of trade data relied heavily on data reported by industry associations and other private groups that shared such information. However, the 2014 trade data reported by international trade databases and United Nations institutions such as the COMTRADE and the International Trade Centre (ITC) have shown that South Africa has reported trade with its trade partners at each and every product level.

[4] Imports from the EU displaced trade traditionally originating from South America.

Among South Africa's leading net exported products citrus fruit (+25%), grapes (+26%), juices (+36%) and nuts (+50%) performed well during 2014, with only maize (-15%) exports declining significantly in value. Current trade data indicates that the growth in citrus fruit exports was due to increased export prices (+25%), with export volumes remaining consistent at 1.74 million tons. Wine export volumes declined 21% from the historically high exports in 2013, while export prices increased 29%, resulting in net exports growing by 2%. Fresh grapes on the other hand experienced both an increase in export volumes (+5%) and export prices (+19%). The value of net imports of wheat (+26%), palm oil (+27%) and tobacco (79%) grew whilst imports of rice (-28%), poultry meat (-4%) and soya-bean oilcake (-16%) were less than during 2013. The growth in the value of wheat imports was driven by a 30% increase in import volumes and a 3% increase in prices. Despite import prices remaining consistent between 2013 and 2014, the volume of rice imports declined by 28%.



	2010	2011	2012	2013	2014
BLNS countries	15.09	15.88	18.01	20.11	21.87
Moz & Zim	5.91	6.43	7.69	10.13	11.76
Rest of Africa	7.46	7.74	9.08	11.84	14.24
Total	28.45	30.05	34.79	42.08	47.87

Figure 1.12: *South African agricultural exports to Africa: 2010 – 2014*
Source: ITC Trademap

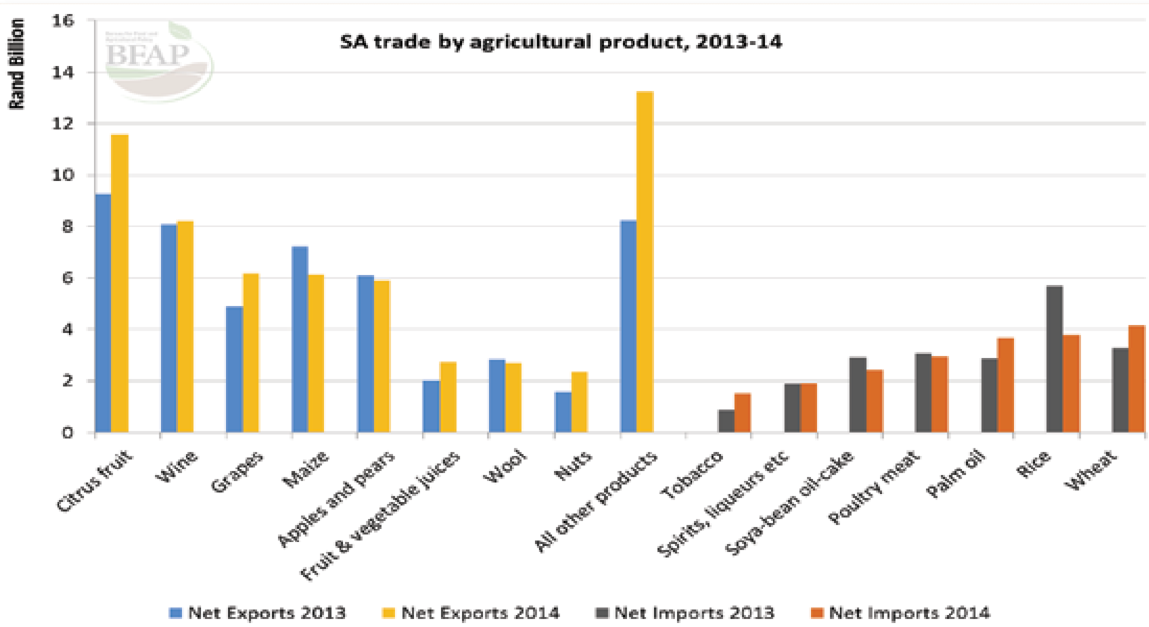


Figure 1.13: *South African agricultural trade balance per product*
Source: ITC Trade Map

The impact of currency value on trade

Although the figures above indicate growth in the value of agricultural exports, it should be noted that this growth was almost equal to the depreciation in the value of the Rand (Figure 1.14). During 2014, the rand depreciated by 12.7% against the US Dollar and 12.8% against the Euro, whereas the value of exports in Rand increased by 12.3%. In other words, the value of

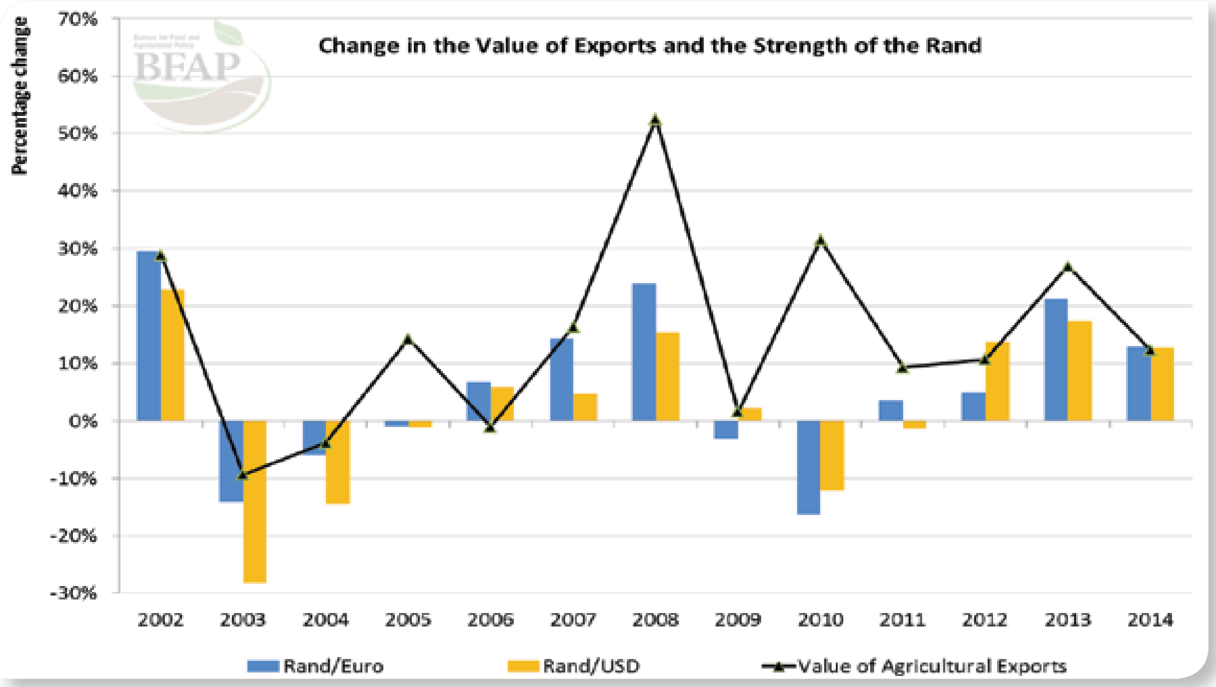


Figure 1.14: *Value of Agricultural Exports and the strength of the Rand*
Source: ITC Trade Map and OANDA.com

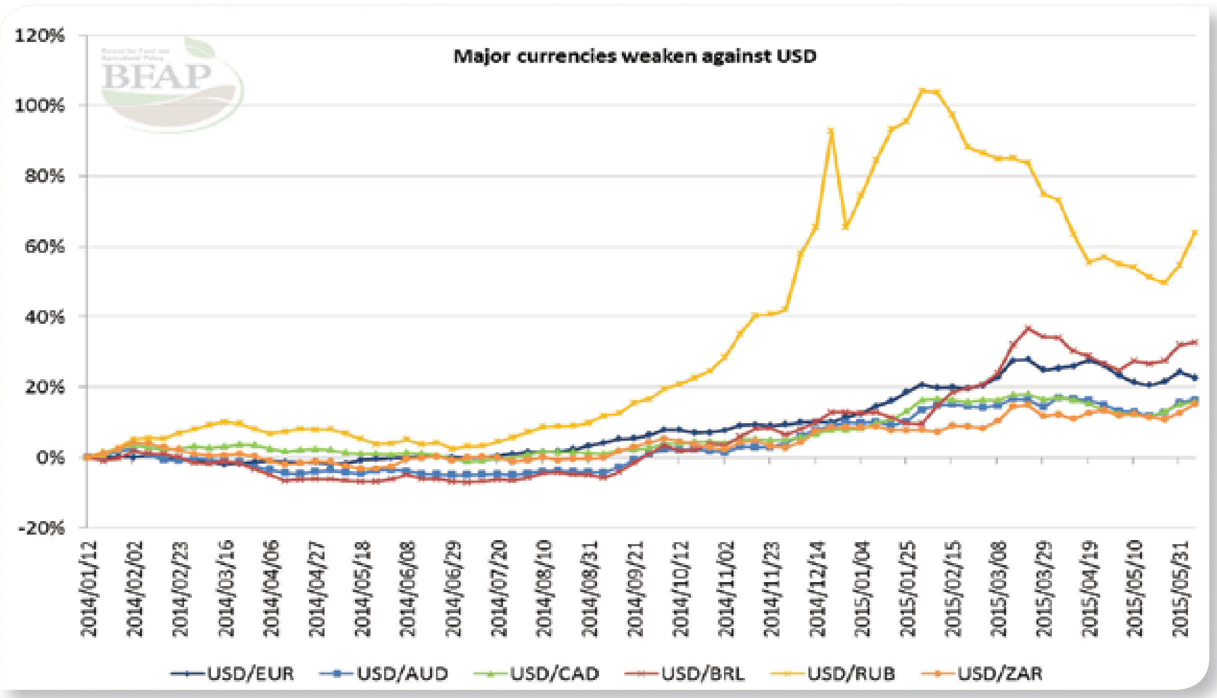


Figure 1.15: *Major currencies weaken against the U.S. Dollar since January 2014*
Source: OANDA.com

exports stayed relatively constant between 2013 and 2014 after taking into account the depreciation of the Rand.

The depreciation is however not unique to South Africa. The value of the Euro and the major so called "commodity currencies" (such as the South African Rand, the Russian Rouble, the Brazilian Real and the Australian- and Canadian dollars) experienced significant devaluations against the U.S. Dollar since the third quarter of 2014. The South African Rand only depreciated 15.2% since January 2014, the least among the currencies depicted in Figure 1.15.

Box 1.1: Prioritising growth and employment opportunities through an agri processing index

South African agriculture has historically been mainly focused on primary production, using foreign suppliers and exporting agricultural produce overseas for either consumption or processing. As such the bulk of processed agricultural produce is imported, even where the agricultural inputs are produced locally. Using average import values between 2006 and 2010 published by the National Department of Agricultural, Forestry and Fisheries, the total value of imports across all agro processing industries amounted to approximately R54 billion, compared to exports of only R33 billion (DAFF, 2012). As South Africa looks to develop into a more sophisticated economy, there is a need to develop capabilities which will allow for greater presence along agricultural value chains, in particular by developing high value downstream industries in processed food and beverages.

Prioritising specific industries along agricultural-linked value chains is important, as these value chains tend to span across different economic industries and thus each has different production requirements and critical success factors, and support different agricultural industries. To ensure that development occurs in a way which answers South Africa's specific developmental needs and offers support to the most appropriate industries, it is essential that research into production opportunities is undertaken at a high level of disaggregation to account for the diversity in important characteristics for different products within broader classification groups.

An Agri Processing Index (API) has been developed at the Western Cape Department of Agriculture which provides an ordinal index for approximately 130 different products, interpreted broadly to represent all the various levels of processing of agricultural products. The index is created by calculating a weighted average across 17 different sub indicators giving different measures relating to production performance (PP), employment potential (EP), domestic market growth (DMG), global market growth (GMG) and the presence of trade barriers (TB). Weights were calculated according to the importance of factors for development, determined through the analysis of similar international studies and consultation with key role players in the relevant industries and supporting government bodies.

Table 1.1 shows the top twenty API's in the food and beverages industry. The API is an index ranging from 0 to 1. The last five columns show the ratings under the five focus areas mentioned above, ranging from 0-10 based on ordinal rankings of the 17 sub-indictors used to measure performance in these areas.

The list above shows the best products in terms of overall scores (note that there are other products which performed strongly only in certain areas). The top three all showed good scores for production performance and both global and domestic market growth, but scored lower in terms of trade barriers and employment potential. It should be noted that, whilst employment potential was lower due to low labour intensity relative to norms in South African agricultural value chains, the intensity remains higher than most of the other manufacturing industries. Furthermore, the substantial growth potential already highlighted for some of these products indicates that even with moderate labour intensity, these industries will be able to create significant employment in the South African economy.

Table 1.1: Product potential in the food and beverage industry: Top 20 products

Rank	Product	Agri Processing Index	Domestic Market Growth	Global Market Growth	Trade Barriers	Production Performance	Employment Potential
1	Mixes and doughs for bread, pastry, biscuits, etc.	0.76	9.00	8.00	5.80	9.43	6.27
2	Roasted Coffee and Coffee Substitutes	0.71	7.75	7.67	5.80	8.52	5.91
3	Sunflower oil	0.70	7.87	8.10	5.80	9.00	4.55
4	Flavoured wine and other alcoholic beverages derived from fruit (excl. wine)	0.68	9.75	7.57	5.30	7.48	4.82
5	Breakfast Cereals	0.67	6.25	5.48	6.20	9.33	6.27
6	Wheat Meal and Wheat Flour	0.67	8.38	8.00	3.40	8.19	5.82
7	Brandy	0.66	6.38	8.19	7.20	7.14	4.27
8	Infant food preparations and formula	0.66	6.00	7.71	4.80	8.29	5.91
9	Processed Nuts (Includes Ground Nuts)	0.65	5.38	6.14	6.00	8.52	6.36
10	Essential oils	0.65	5.20	5.14	5.80	9.43	6.09
11	Whey, milk powder, creamers and other milk products	0.64	5.88	10.00	5.90	5.52	4.45
12	Soya bean oil	0.63	6.00	4.67	6.30	9.24	5.45
13	Sweet biscuits, waffles and wafers	0.63	5.50	6.62	4.50	8.24	6.55
14	Olive oil, canola oil and other vegetable oils (excl. soya bean and sunflower)	0.63	5.50	7.95	4.00	9.10	4.55
15	Margarine, edible animal or veg oil preparations nes	0.63	4.50	6.95	5.40	9.00	5.00
16	Meal and Flour from Oats, Barley, Rye and Malt	0.62	2.25	7.10	6.00	8.52	6.27
17	Whisky, gin vodka and other spirituous liquors	0.62	4.63	5.05	8.00	8.38	4.82
18	Maize Meal and Maize Flour (includes samp and mielie rice)	0.60	4.25	8.43	2.60	8.52	5.82
19	Processed non-confectionary sugars, sugar syrups and molasses	0.60	7.00	6.71	7.90	5.19	3.82
20	Dried Fruit	0.59	1.88	4.33	5.80	8.95	7.55

KEY BASELINE ASSUMPTIONS

Policies

The baseline assumes that current international as well as domestic agricultural policies will be maintained throughout the period under review (2015 – 2024). In a global setting, this assumes that all countries adhere to their bilateral and multilateral trade obligations, including their WTO commitments, as well as stated objectives related to biofuel blending mandates. On the domestic front, current policies are maintained. With the deregulation of agricultural markets in the mid-nineties, many non-tariff trade barriers and some direct trade subsidies to agriculture were replaced by tariff barriers. In the case of maize and wheat, variable import tariffs were introduced. The variable import tariff for wheat was replaced by a 2% ad valorem tariff in 2006. However, in December 2008 the original variable import levy system was re-introduced, and the reference price that triggers the variable import levy on wheat was adjusted upwards from $157/ton to $215/ton. Following the sharp increase in world price levels in 2012, the industry submitted a request for a further increase in the reference price, which was accepted in 2013, increasing the reference price to $294/ton.

Global maize prices have traded significantly higher than the reference price in recent years and international prices are not projected to fall below the reference price of $110 per ton over the next decade. Consequently, no maize tariff is applied over the Outlook. In contrast, wheat prices have already fallen below the reference price of $294/ton and consequently the import duty on wheat is triggered in 2015, remaining in place over the course of the Outlook as the projected world price for wheat remains below $294/ton. Ad valorem tariffs are applied in the case of oilseeds. In the case of meat and dairy products, a combination of fixed rate tariffs and/or ad valorem tariffs is implemented. General duties on imported chicken were increased substantially in October 2013, however a significant share of total imports originate from the European Union and therefore carry no duty under the TDCA. Furthermore, South Africa applies anti-dumping duties of R9.40 per kilogram on bone-in chicken pieces originating from the United States. In June 2015, it was announced that this anti-dumping duty would be removed for a quota of 65 thousand tons of bone-in portions originating from the United States. While this concession is not included in the baseline projections due to the close proximity of the announcement to the publication date, a scenario that illustrates the possible impact of the concession is included in Box 8.1 in the meat outlook chapter. The projected tariff levels, as derived from the FAPRI projections of world commodity prices, are presented in Table 2.1.

Table 2.1: Key policy assumptions

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
R/ton											
Maize tariff: (Ref. price = US$ 110)	0	0	0	0	0	0	0	0	0	0	0
Wheat tariff (Ref price = US$ 294)	0	322	703	710	730	648	596	585	660	749	857
Sunflower seed tariff: 9.4 % of fob	445	426	483	505	551	583	602	620	627	630	629
Sunflower cake tariff: 6.6 % of fob	204	199	144	147	162	176	181	177	173	165	158
Sorghum tariff: 3 % of fob	71	69	67	71	76	80	83	85	87	89	90
Soya bean tariff: 8 % of fob	426	358	360	388	426	447	459	473	478	482	488
Soya bean cake tariff: 6.6 % of fob	360	280	260	266	287	304	315	318	318	313	313
Tons											
Cheese, TRQ quantity	1199	1199	1199	1199	1199	1199	1199	1199	1199	1199	1199
Butter, TRQ quantity	1167	1167	1167	1167	1167	1167	1167	1167	1167	1167	1167
SMP, TRQ quantity	4470	4470	4470	4470	4470	4470	4470	4470	4470	4470	4470
WMP, TRQ quantity	213	213	213	213	213	213	213	213	213	213	213

Table 2.1: Key policy assumptions (continued)

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Percentage											
Cheese, in-TRQ	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Butter, in-TRQ	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8
SMP, in-TRQ	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2
WMP, in-TRQ	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2
c/kg											
Cheese, above TRQ rate	500	500	500	500	500	500	500	500	500	500	500
Butter, above TRQ rate	500	500	500	500	500	500	500	500	500	500	500
SMP, above TRQ rate	450	450	450	450	450	450	450	450	450	450	450
WMP, above TRQ rate	450	450	450	450	450	450	450	450	450	450	450
Beef tariff: max(40 %*fob,240c/kg)	1486	1638	1628	1530	1491	1479	1518	1587	1666	1738	1808
Lamb tariff: max(40 %* fob,200c/kg)	1419	1494	1498	1478	1564	1623	1689	1763	1834	1902	1976
Chicken tariff (Whole frozen): 82%	876	889	862	888	952	1006	1057	1101	1140	1174	1210
Chicken Tariff (Carcass): 31%	120	114	107	107	109	112	114	116	116	116	120
Chicken Tariff (Boneless Cuts): 12%	317	321	312	321	344	364	382	398	412	424	424
Chicken Tariff (Offal): 30%	213	216	210	216	232	245	257	268	278	286	286
Chicken Tariff (Bone in portions): 37%	618	626	607	626	671	709	745	776	804	828	828
Pork tariff: max(15 %* fob, 130c/kg)	235.9	181.5	186.7	181.7	193.9	208.1	223.4	236.3	244.7	248.2	252.1

Macroeconomic assumptions

To some extent, the baseline simulations are driven by the outlook for a number of key macroeconomic indicators. Projections for these indicators are mostly but not exclusively based on information provided by the OECD, the IMF and Global Insight.

Table 2.2: Key macro-economic assumptions

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Millions											
Total population of SA	54.0	54.7	55.2	55.6	56.0	56.4	56.7	57.0	57.3	57.7	57.97
US $/barrel											
Brent Crude oil	104.6	64.0	68.0	72.4	77.4	83.0	89.2	95.6	102.1	108.7	115.3
SA cents/Foreign currency											
Exchange rate (SA cents/US$)	1090	1192	1233	1271	1336	1376	1416	1456	1498	1541	1586
Exchange rate (SA cents/Euro)	1485	1482	1533	1561	1621	1650	1682	1713	1748	1784	1823
Percentage Change											
Real GDP per capita	1.40	2.00	2.60	3.00	3.30	3.57	3.51	3.49	3.56	3.57	3.57
GDP deflator	6.30	5.70	5.58	5.50	5.30	5.30	5.30	5.40	5.40	5.40	5.40
Percentage											
Weighted prime interest rate	9.3	9.5	9.6	9.6	9.7	9.8	9.8	9.9	9.9	10.0	10.1

CONSUMER TRENDS AND ANALYSIS

The consumer analysis presents a discussion of the dynamic South African consumer landscape which underpins the modelling projections presented in this edition of the BFAP baseline. The analysis includes general information on the demographic characteristics of South African consumers, dynamic changes in South Africa from a socio-economic perspective, preference trends affecting the food choices of particularly middle and high income consumers and consumption trends for income groups over time.

Demographics of the South African Consumer

The LSM® (Living Standards Measure) segments of the South African Audience Research Foundation (SAARF) are a widely acknowledged approach to describe the socio-economic characteristics of South African households. The SAARF LSM segments are not directly based on the income levels of consumers, but are built upon consumers' access to various amenities, such as durables, household location and dwelling type (www.saarf.co.za). A summary profile of the South African consumer market according to the SAARF LSM® segment is presented in Figure 3.1 and Table 3.1. Four lifestyle levels could be defined within the LSM spectrum as illustrated by Figure 3.1.

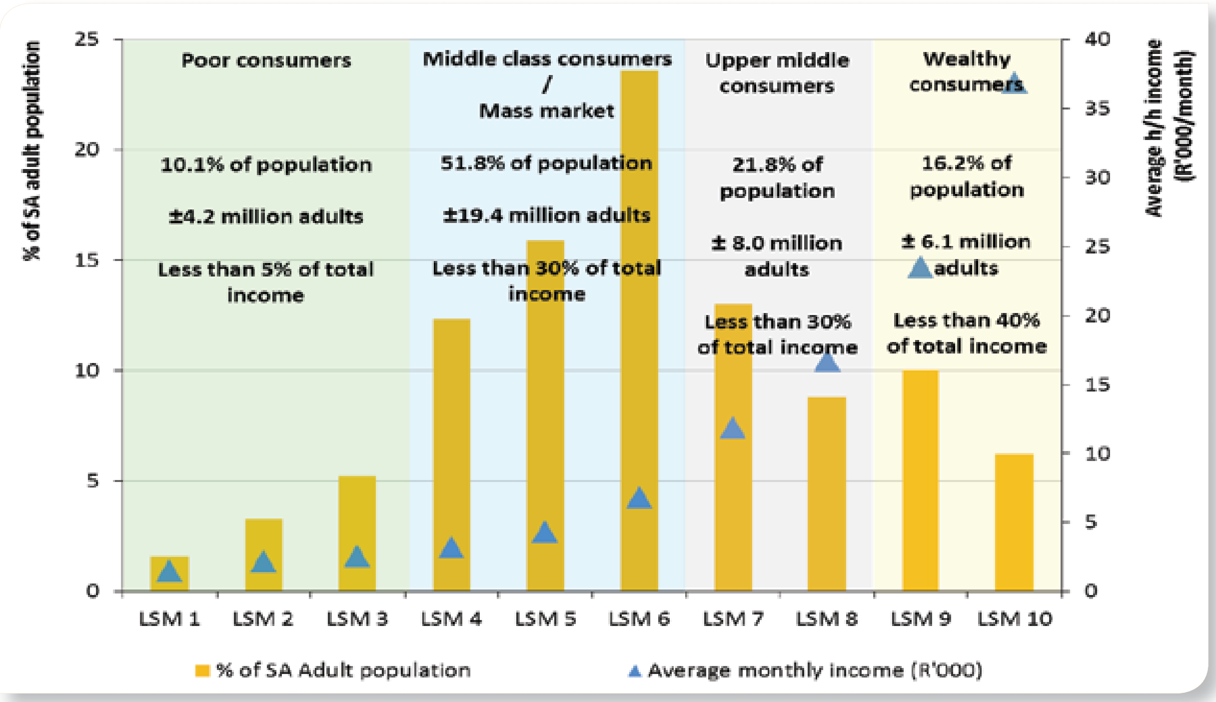


Figure 3.1: *The SAARF LSM Segments: Proportion of SA adult population and average monthly household income in 2013/2014*
Source: SAARF All Media and Products Survey (AMPS) 2013, 2014A

Table 3.1: A summary of the South African consumer market in 2013 based on the SAARF LSM segments

LSM ®:	% of SA adults*:	Average household monthly income***:	Dominant age groups**:	Dominant education level**:	Dominant location (rural/ urban)**:	Dominant Provincial location**:	Unemploy-ment % – self reported ***:	Dominant dwelling type***:	Electricity in home***:	Tap water in home/on plot***:
1	1.6%	R1 480	50+ (43%) 35-49 (23%)	Up to primary completed (47%) Some high schooling (37%)	100% rural	E Cape (64%) KZN (23%)	40.6%	Traditional hut (80%)	27%	0%
2	3.3%	R2 218	50+ (31%) 15-24 (30%)	Some high schooling (47%) Up to primary completed (34%)	97.4% rural 2.6% urban	KZN (41%) E Cape (31%) Limpopo (10%)	45.5%	Traditional hut (47%) House/cluster house/ town house (28%)	35%	12%
3	5.2%	R2 585	50+ (29%) 15-24 (27%)	Some high schooling (54%) Up to primary completed (27%)	89.3% rural 10.7% urban	KZN (30%) E Cape (27%) Limpopo (16%)	45.4%	Traditional hut (38%) House/cluster house/town house (35%)	69%	29%
4	12.3%	R3 205	15-24 (30%) 50+ (28%)	Some high schooling (55%) Matric (22%)	83.8% rural 16.2% urban	KZN (25%) Limpopo (24%) E Cape (16%)	43.0%	House/cluster house/ town house (60%) Traditional hut (17%)	93%	52%
5	15.9%	R4 344	15-24 (29%) 25-34 (27%)	Some high schooling (50%) Matric (32%)	55.1% rural 44.9% urban	KZN (19%) Limpopo (19%) Gauteng (16%)	38.4%	House/cluster house/ town house (69%) Matchbox/Improved matchbox (15%)	98%	82%
6	23.6%	R6 822	25-34 (27%) 35-49 (26%)	Some high schooling (45%) Matric (37%)	17.8% rural 82.2% urban	Gauteng (30%) KZN (14%) W Cape (14%)	35.2%	House/cluster house/ town house (77%) Matchbox/Improved matchbox (11%)	99%	97%

Table 3.1: A summary of the South African consumer market in 2013 based on the SAARF LSM segments (continued)

LSM ®:	% of SA adults*:	Average household monthly income***:	Dominant age groups**:	Dominant education level**:	Dominant location (rural/ urban)**:	Dominant Provincial location**:	Unemploy-ment % – self reported ***:	Dominant dwelling type***:	Electricity in home***:	Tap water in home/on plot***:
7	13.0%	R11 882	25-34 (29%) 35-49 (25%)	Matric (43%) Some high schooling (36%)	6.4% rural 93.6% urban	Gauteng (40%) W Cape (19%) KZN (14%)	23.6%	House/cluster house/ town house (83%) Flat (12%)	100%	99%
8	8.8%	R16 754	50+ (27%) 25-34 (26%)	Matric (43%) Some high schooling (29%)	5.9% rural 94.1% urban	Gauteng (40%) W Cape (20%) KZN (15%)	16.6%	House/cluster house/ town house (87%) Flat (11%)	100%	100%
9	10.0%	R23 539	35-49 (28%) 50+ (28%)	Matric (42%) University / Technicon (25%)	5.5% rural 94.5% urban	Gauteng (39%) W Cape (21%) KZN (16%)	13.2%	House/cluster house/ town house (94%) Flat (6%)	100%	100%
10	6.2%	R36 883	50+ (31%) 35-49 (28%)	University / Technicon (36%) Matric (34%)	3.5% rural 96.5% urban	Gauteng (42%) KZN (22%) W Cape (17%)	5.2%	House/cluster house/ town house (99%)	100%	100%

*Source: *AMPS 2014B; ** AMPS 2014A; ***AMPS 2013B*

Dynamics in the South African consumer environment:

RISING INCOME

SAARF LSM AMPS data from the past five years indicates that average monthly household income across the population increased from R6 928 in 2009 to R10 525 in 2014, representing a 51.9% nominal increase and a 22.3% real increase. Table 3.2 presents the changes within the various income brackets over this time period. Comparing 2014 to 2009, the share of the population with a household income of less than R5000 decreased from 56% to 40%, while the share of the population with a household income of R5000 or more increased from 44% to 60% (representing a 36% increase over a period when CPI inflation amounted to approximately 30%).

CLASS MOBILITY

Class mobility, defined as the movement of consumers towards higher LSM groups, has been a key feature of the South African consumer landscape for many years. From 2004 to 2014 the share of South African adults within SAARF LSM® segments 1-4 declined by 82%, accompanied by an increase in the share of the adult population classified within wealthier segments such as LSM 6 (+68%), LSM 7 (+110%), LSM 8 (+82%), and LSM 9 (+68%) (Figure 3.2). In recent years the class mobility rate has been variable, but generally increasing in most socio-economic sub-groups after slowing down from 2007/2008 up to 2009/2010 due to recession impacts.

Table 3.2: Changes in household income brackets: comparing 2009 to 2014

Total population average monthly household income:	2009		2014	
	Share of adult population:			
R1 – R799	5.7%	56%	1.8%	40%
R800 – R1 399	17.1%		6.7%	
R1 400 – R2 499	14.6%		8.1%	
R2 500 – R4 999	19.0%		22.9%	
R5 000 – R7 999	13.8%	44%	17.6%	60%
R8 000 – R10 999	10.2%		12.0%	
R11 000 – R19 999	10.3%		14.3%	
R20 000+	9.3%		16.6%	

Source: AMPS 2009; AMPS 2014B

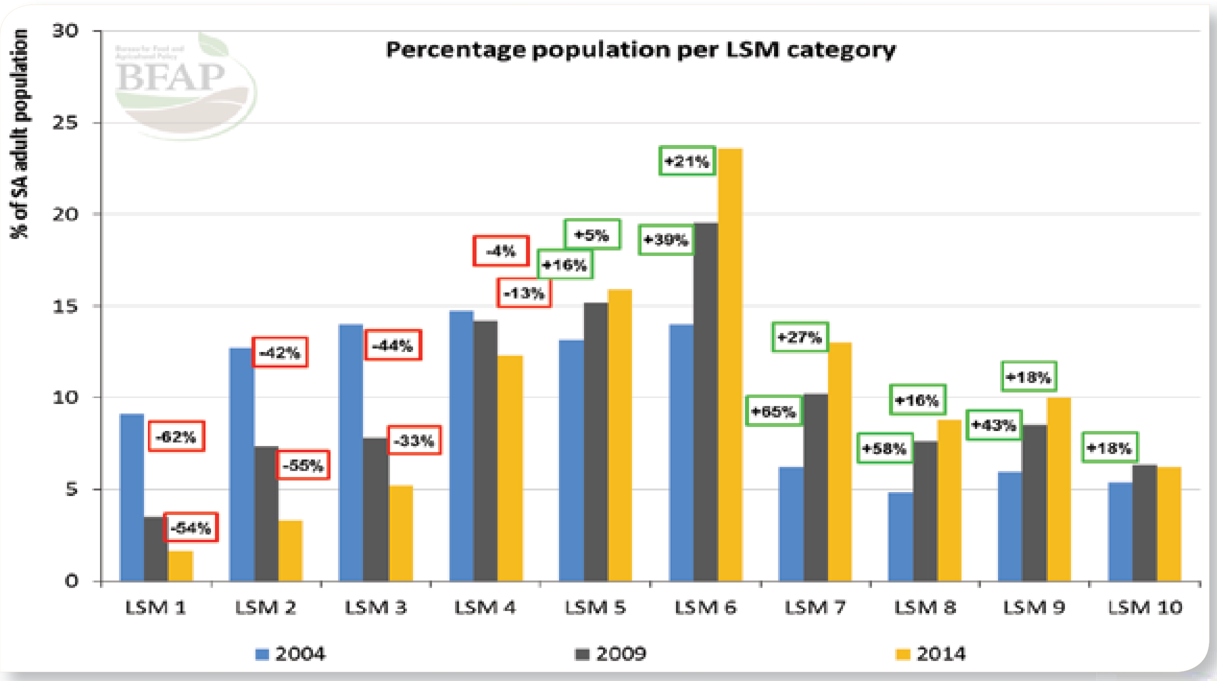


Figure 3.2: *LSM class mobility: All adults for the period 2004 to 2014*
Source: SAARF All Media and Products Surveys (AMPS) 2004, 2009, 2014

Ethnic class mobility in South Africa

The increasingly expanding higher LSM segments (LSM 7 upwards) have a growing black consumer component, as illustrated by Figure 3.3, indicating that from 2007 to 2014 the share of black consumers in LSM 7 and 8 increased by 25%, while the share of black consumers in LSM 9 and 10 increased by 99%.

URBANISATION

Data on the level of urbanisation in South Africa varies between sources, but is generally estimated somewhere between 60% and 70%:

- Statistics South Africa Census 2011: 62%
- Statistics South Africa Income and Expenditure Survey 2010/11: 67%
- SAARF AMPS 2014A: 64%

Regardless of the differences, all the sources above confirm the increasing trends in urbanisation, as illustrate in Figure 3.4, based on the SAARF AMPS data. Figure 3.4 illustrates that the rural population size increased by 9% from 2007 to 2014, while the urban population expanded by a significantly higher 29%.

AGE DISTRIBUTION

South Africa has a relatively youthful population with 49% of the population being younger than 25 years of age and 67% of the population being younger than 35 years of age in 2011 (Census 2011). Median population age data indicates that the population is gradually ageing; the median population age has increased from 23 years according to Census 2001 to 25 years according to Census 2011. The SAARF AMPS data presented in Figure 3.5 also confirms the gradually ageing population in South Africa. In 2010 people aged 35 and older represented 47.1% of the adult population, increasing to 50.1% in 2014.

EDUCATION LEVELS

Education levels in South Africa have improved significantly from 2010 to 2014, with a 54% reduction in the number of adults with no education, and significant increases in the number of adults with some high schooling, matric and post-matric qualifications (SAARF AMPS 2010 & 2014). Nevertheless, the quality of education still remains a major concern, especially

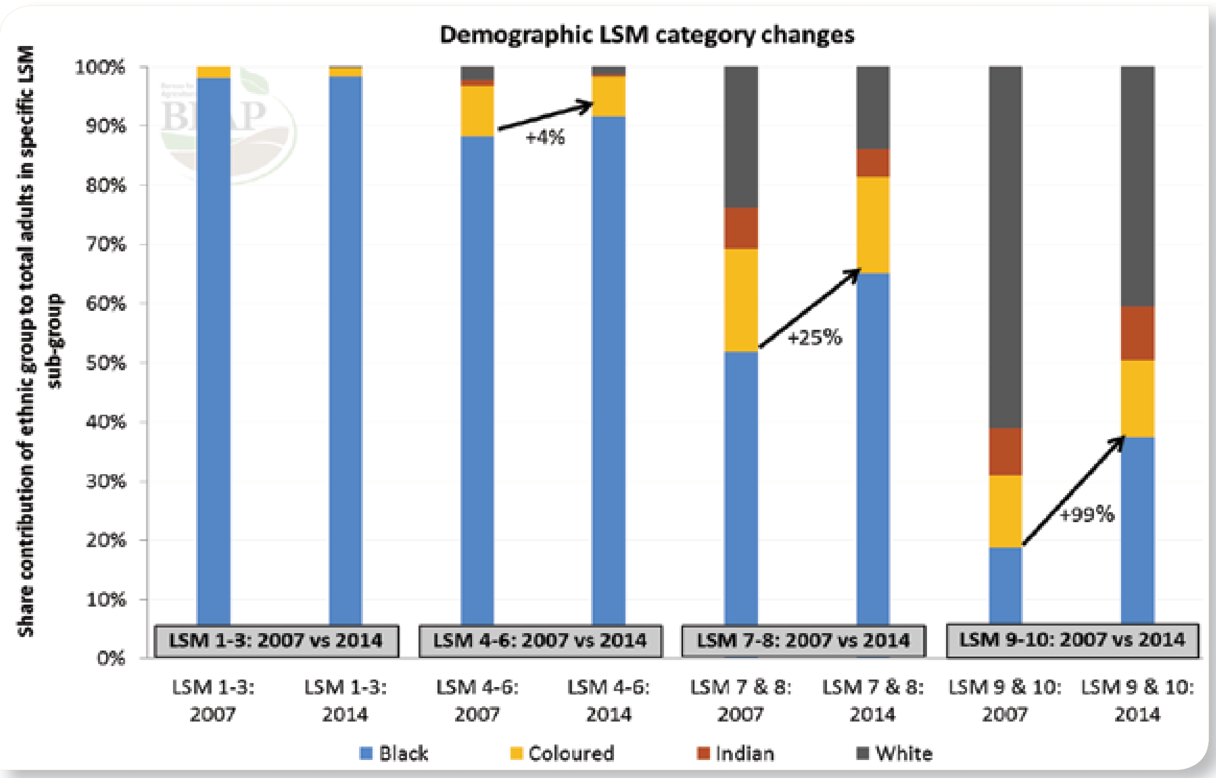


Figure 3.3: *LSM ethnic class mobility: All adults for the periods 2007 vs 2014*
Source: SAARF AMPS 2007 & 2014

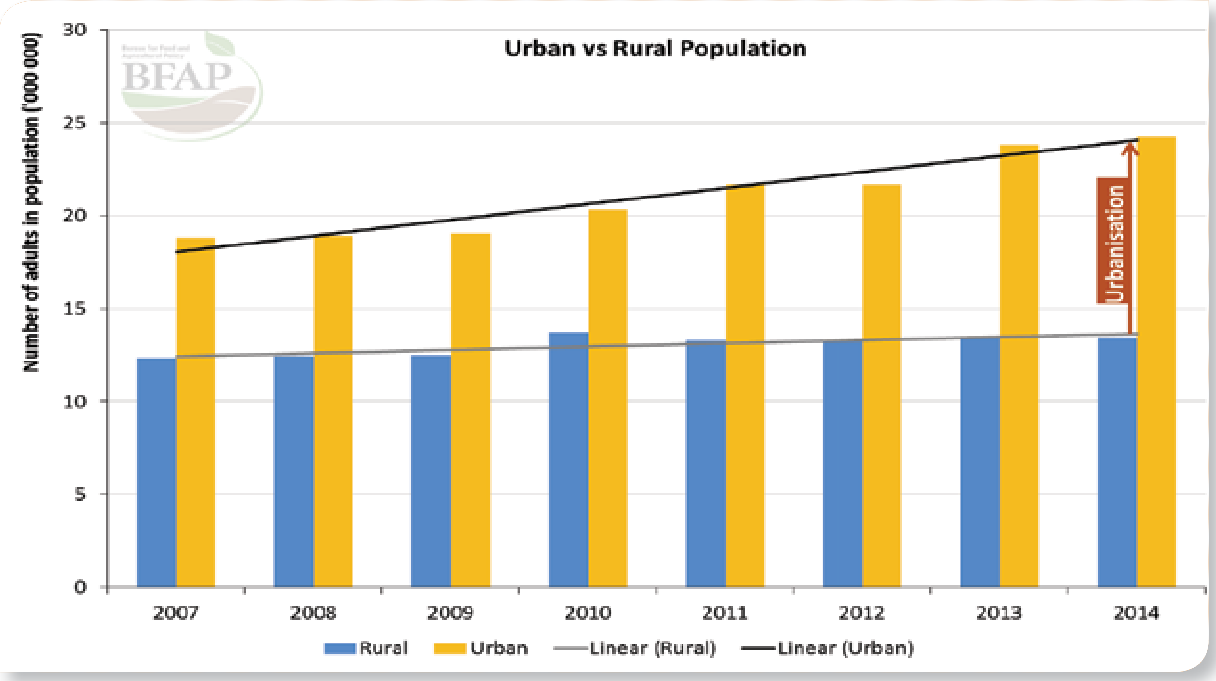


Figure 3.4: *Urbanisation according to SAARF AMPS data for the period 2007 to 2014*
Source: SAARF AMPS 2007 to 2014

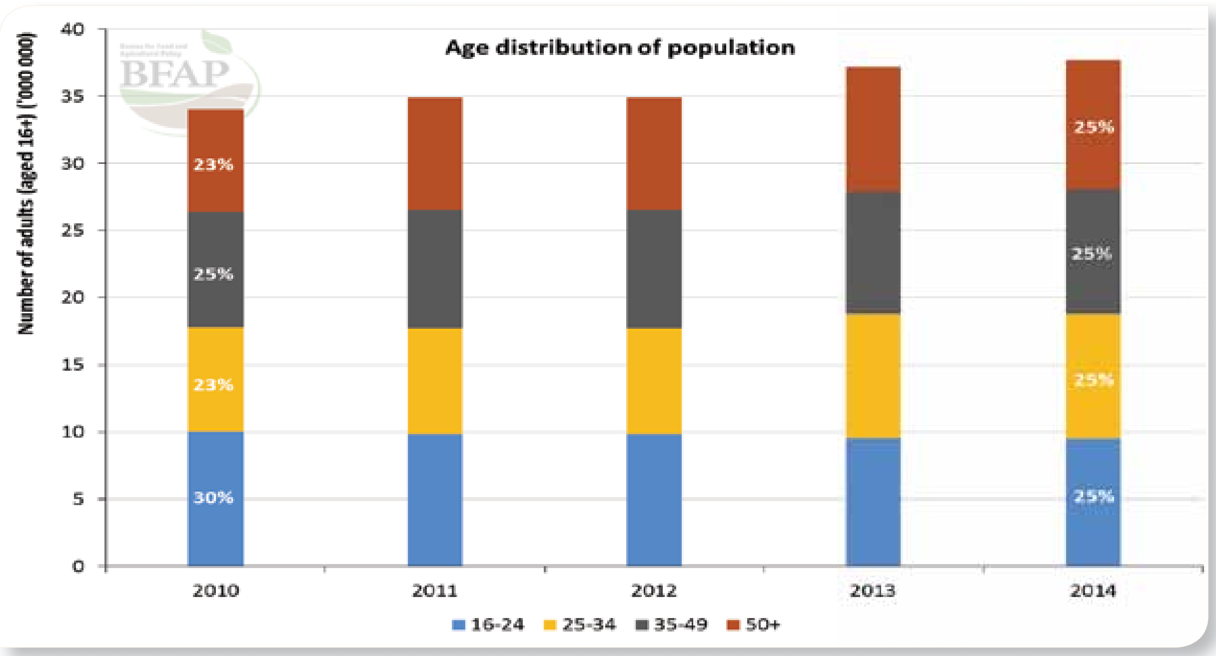


Figure 3.5: *The dynamic age distribution in South Africa – a view on 2010 to 2014*
Source: SAARF AMPS 2010 to 2014

in maths and science where South Africa has been performing poorly in the latest benchmark in educational programs across the continent. The most prominent increases in the share of consumers within LSM sub-segments with particular education levels occurred in terms of:

- LSM 1-3: Primary schooling and some high schooling
- LSM 4-6: Some high schooling
- LSM 7-10: Post-matric qualification

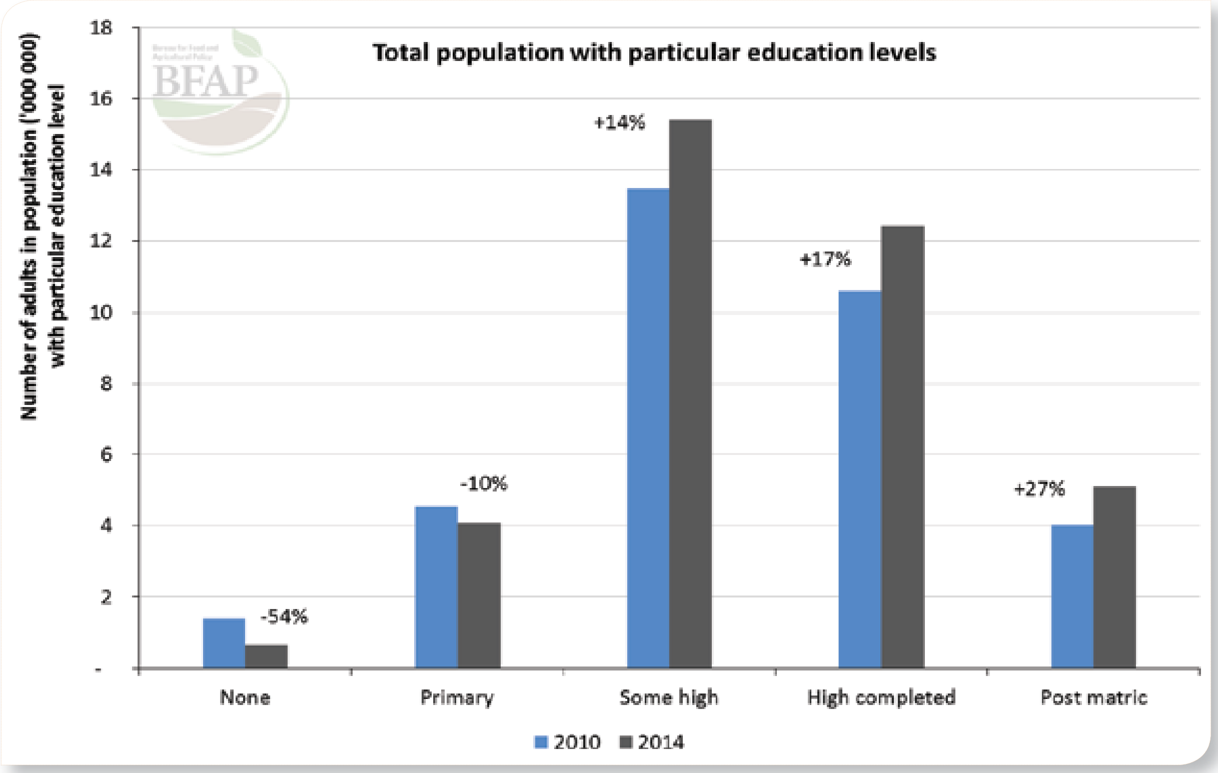


Figure 3.6: Education levels of the South African population: 2010 vs 2014
Source: SAARF AMPS 2010 & 2014

UNEMPLOYMENT

Unemployment data can also be obtained from different sources, a summary of which is presented in Table 3.3. At provincial level the lowest unemployment levels were found in Western Cape (22.9%) and KwaZulu-Natal (20.8%), while the highest unemployment levels were found in the Free State (32.2%), Eastern Cape (29.1%) and Northern Cape (28.7%) (Stats SA Quarterly Labour Force Survey, February 2015).

In terms of age groups the highest unemployment levels are found among adults aged 15 to 34 years (representing about half of the adult population in South Africa). Amongst individuals aged 25 to 34 years, an unemployment rate of 48.8% was evident, whilst this rate declines to 20.6% for individuals aged 25 to 34 years (Stats SA Quarterly Labour Force Survey, February 2015).

Table 3.3: Unemployment in South Africa

Source:	Unemployment rate:		Comments:
	Initial value:	Recent value:	
Census data	2001: 41.6%	2011: 29.8%	Decreasing trend in all provinces
Stats SA Quarterly Labour Force Survey	Q3 2010: 25.4%	Q4 2014: 24.3%	Decreasing trend from a high point in Q3 2010

Source: Stats SA (2015)

DEBT

For some time South African consumers have been moving consistently deeper into debt. Towards the fourth quarter of 2014, the following changes had occurred from early 2009 (National Credit Regulator statistics):

- The total Rand value of credit granted increased by 127.5% to R117.6 billion, being somewhat lower than the level of R118.7 billion in the 4th quarter of 2013;
- The number of credit applications received increased by 102.2% to 11.527 million representing the highest level since the fourth quarter of 2012;
- The credit application rejection rate increased from 43.9% to 53.5%;
- The number of active credit accounts increased by 18.5% to 41.2 million.
- In the fourth quarter of 2014, 44% of credit facilities were granted to consumers with less than R5500 income per month, while these credit grants contributed about 13% in value terms (National Credit Regulator statistics).

The pressure experienced by consumers is also reflected by the FNB/BER consumer confidence index, which had fallen to a decade low of minus 8 in the third quarter of 2013. Having recovered to a level of zero by the end of 2014, the index slipped back to minus four again during the first quarter of 2015, reflecting concern related to financial positions and continuous interruptions in energy supply. The possibility of further electricity price hikes presented further concern. If such hikes were to be approved, the impact would be evident in disposable income levels and consequently also on household consumption patterns (Box 3.1).

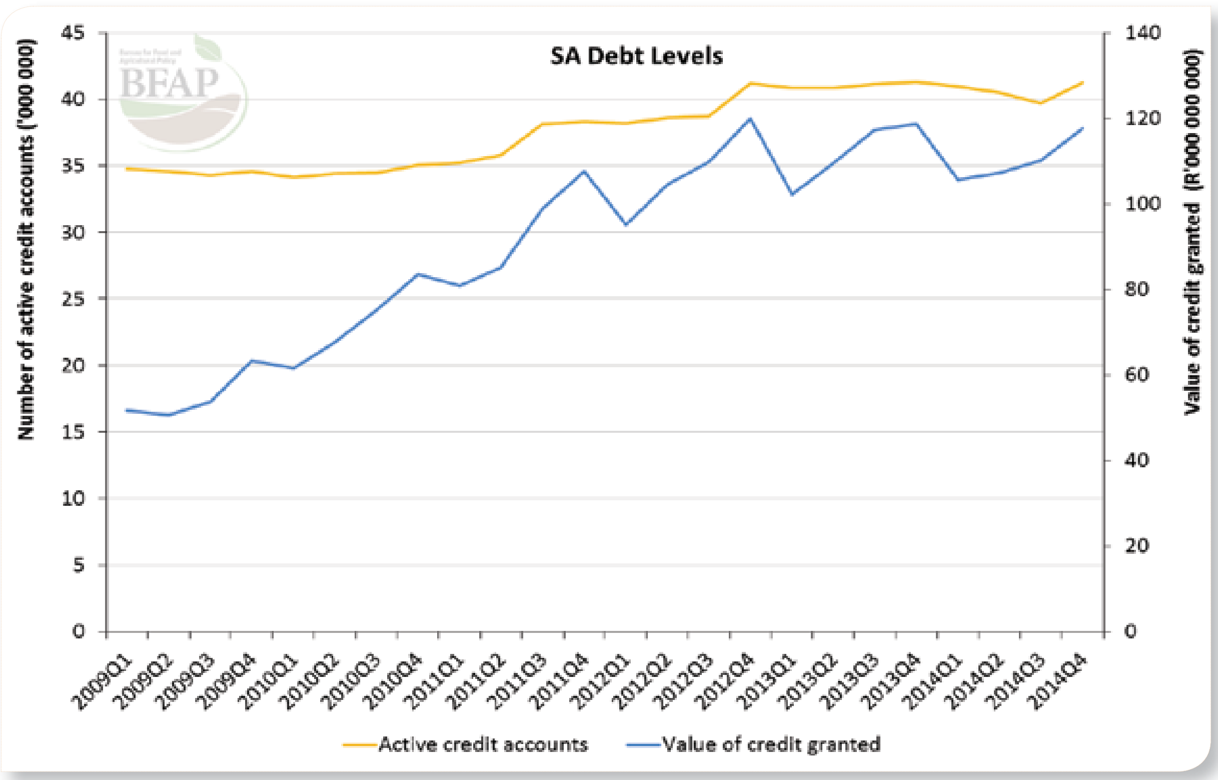


Figure 3.7: *Consumer debt in South Africa*
Source: National Credit Regulator statistics

Box 3.1: Exploring the effect of increased electricity tariffs on household staple food consumption

The Pietermaritzburg Agency for Community Social Action [PACSA] held focus group discussions around Pietermaritzburg in the second quarter of 2013. These focus group discussions revealed that lower income consumers are moving away from maize meal and increasing rice consumption, since it takes a shorter time to cook. Before the electricity price increases, consumers reported eating much more maize meal than rice. PACSA focus groups revealed that, due to the severe increases in electricity prices, the consumption ratio between maize meal and rice has changed from 75:25 , in 2010/2011 to 50:50 in 2013. This fact is further substantiated by the rise in imports evident from 2010 to 2013 (Figure 3.8) and has far reaching implications on household nutrition and budgets.

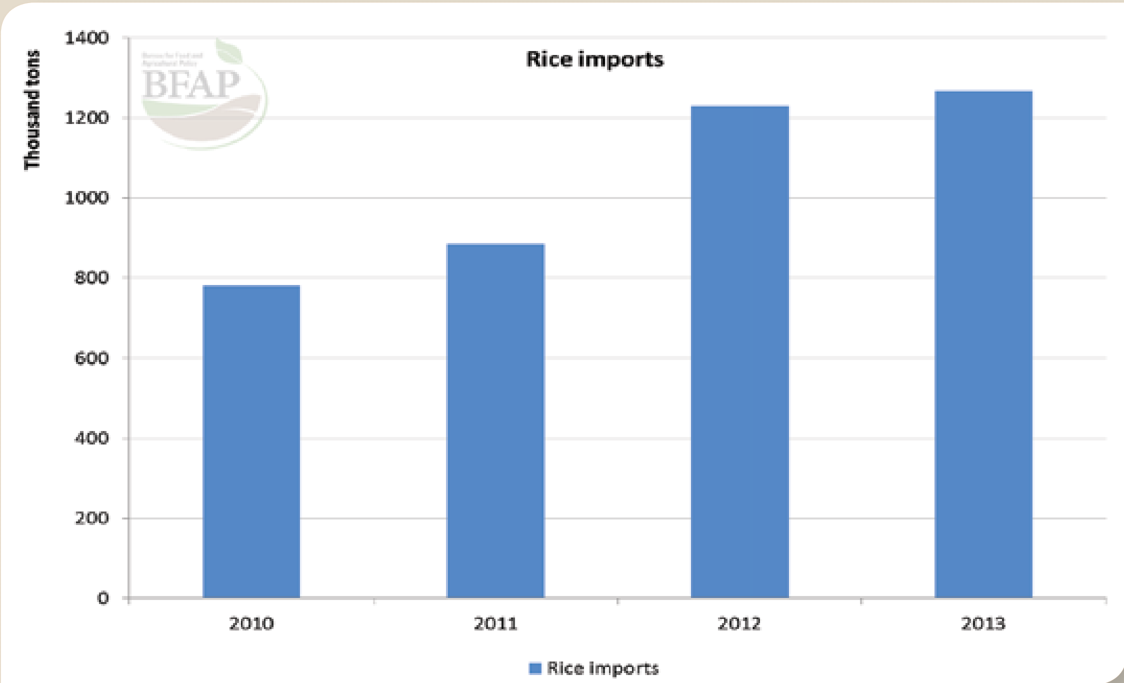


Figure 3.8: *South African rice imports: 2010-2013*

Nutritional Implications

Maize meal is fortified whereas rice is not. Table 3.4 below gives an indication of the micro-nutrients in each of these staples.

Staple shift increases households exposure to macro-economic drivers

Dependence on rice increases the exposure of lower income consumers to certain macro-economic and global factors such as the exchange rate. South Africa relies exclusively on imported rice and negative exchange rate movements could add to affordability pressures on such food baskets. It is expected that the rand will be under pressure over the next 12 months, as an interest rate hike seems imminent in the United States. This will cause capital to move to the US and away from emerging markets such as South Africa, causing the rand to depreciate further. If the rand depreciates by 10% over the next 12 months it is estimated that it will cause local retail prices of rice to increase by approximately 3% to an average price per kg of around R14.01.

Table 3.4: Nutrient composition of different staples

Nutritional component:		Maize meal super white fortified (raw) 100g	Rice, white (raw) 100g
Energy (kJ)		1380	1154
Macro-nutrients	Carbohydrates (g)	74	60
	Protein (g)	7.6	5.9
Minerals	Ca (mg)	5	24
	P (mg)	60	102
	Zn (mg)	2.1	1.0
	Fe (mg)	2.6	0.4
	K (mg)	98	85
	Cu (mg)	0.1	0.1
	Mg (mg)	38	28
	Na (mg)	3	4
	Mn (Qg)	190	1022
Vitamins	A (QgRE)	184	0
	B6 (mg)	0.63	0.20
	Biotin (Qg)	3.9	2.2
	Thiamin (mg)	0.4	0.0
	Folic acid (Qg)	210	6.5
	Riboflavin (mg)	0.19	0.02
	B12 (Qg)	0	0
	D (Qg)	0	0
	Niacin (mg)	3.5	0.9
	Pant (mg)	0.34	0.85
	E (mg)	0.36	0.09

Source: Adopted from South African Food-based Dietary Guidelines

Implications for staple food expenditure

Household expenditure data (StatsSA IES 2010/11) indicates a 70/30 ratio of maize meal to rice expenditure for the poorest 30% of the population. It is estimated that these expenditure levels represents a serving ratio of about 85/15 (number of maize meal servings to rice servings). If consumers would increase their rice serving to a 50/50 ratio in relation to maize meal, it could imply an additional cost of about R22 per household per month at 2010/11 consumption levels (i.e. difference between (C) and (A) in Figure 3.9). However, it could also be argued that in the face of the lack of additional money to spend on rice, households could reduce the serving size of rice to balance their budgets. According to the results presented in Figure 3.9, a 3% increase in the price of rice (e.g. due to exchange rate changes) only contributes R2.14 extra to the hypothetical 50/50 serving option (i.e. difference between (D) and (C) in Figure 3.9).

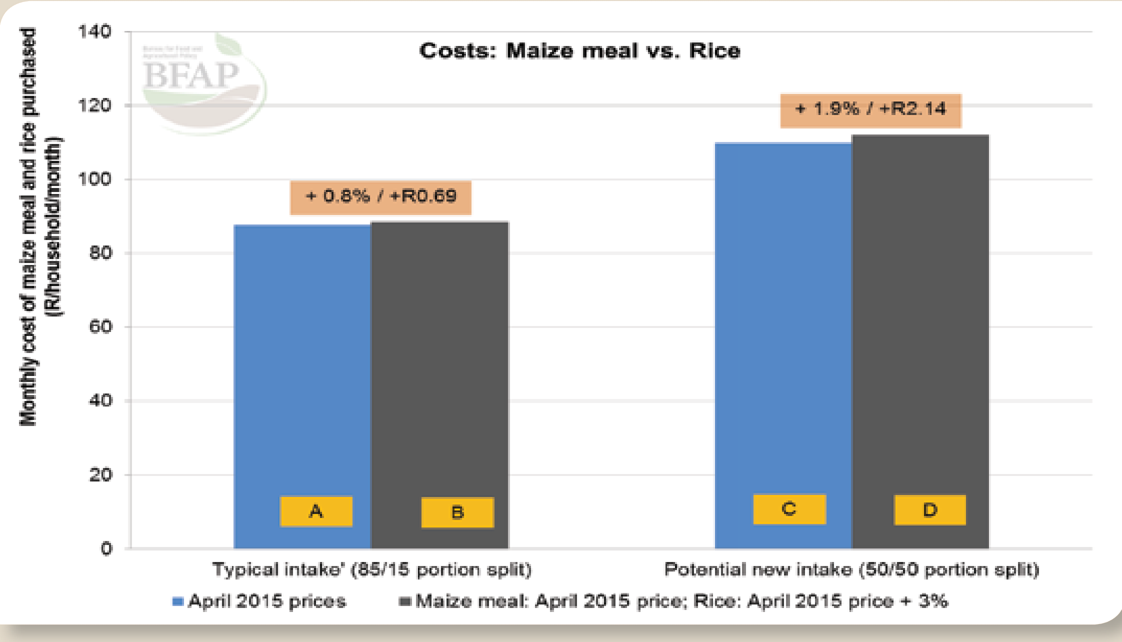


***Figure 3.9:** Estimate cost of maize meal and rice for poor consumers under different scenarios*

NUTRITIONAL STATUS

The following key nutritional issues within the main socio-economic sub-segments in South Africa were identified through recent interaction with dieticians and nutritionists*, supplemented with key trends observed in literature:

Marginalised / low-income consumers:

Dominant problems:	Related causes / food behaviour:

• Under-nutrition
• Food insecurity
• Overweight
• Stunting
• Non-communicable diseases (e.g. cardiovascular diseases, diabetes, chronic respiratory conditions, cancer and stroke)
	• Concerns regarding the allocation of food within the household among children and adults.
	• Tobacco use.
	• Physical inactivity.
	• Harmful use of alcohol.
	• Limited dietary variety due to factors such as food affordability, access to healthy food, limited or no cold storage facilities in home:
	  • Fruit & vegetable intake low and lacks diversity.
	  • Consuming too much starch foods

Middle-income consumers:

Dominant problems:	Related causes / food behaviour:
• Overweight and obesity. • Malnutrition • Non-communicable diseases (e.g. cardiovascular diseases, diabetes, chronic respiratory conditions, cancer and stroke)	• Inadequate meal planning and preparation time. • Excessive fast food intake that is usually high in fat. • Inadequate intake of fresh fruit and vegetables. • Food affordability concerns. • 'Bad' choices – Could this be linked to inadequate knowledge of healthy eating? • Physical inactivity. • Tobacco use. • Harmful use of alcohol.

Wealthy consumers:

Dominant problems:	Related causes / food behaviour:
• Overweight and obesity. • Non-communicable diseases (e.g. cardiovascular diseases, diabetes, chronic respiratory conditions, cancer and stroke)	• Limited nutrient variety, e.g. o Eating less home-cooked meals – impact of nutrient intake. o Excessive food-out-of-home intake (e.g. restaurant meals, take-away meals). Linked to questions on the nutrient content of such meals. • Inadequate fibre intake. • Incorrect intake ratio of fat/carbohydrate/protein. • Excessive processed / refined food intake. • Increasing incidence of eating disorders. • Harmful use of alcohol. • Tend to engage in 'fad' diets. • Lack of a set eating routine, e.g. skipping breakfast, eating late at night. • Physical inactivity. • Tobacco use.

** Acknowledgement: Co-authors for section – Prof HC Schönfeldt, Dr B Pretorius.*

IN SHORT,

THE DYNAMIC SOUTH AFRICAN CONSUMER LANDSCAPE

OVER THE LAST FEW YEARS HAS BEEN CHARACTERIZED BY:

- Growing real household income across most income groups
- Class mobility, particularly evident in the growing middle class and growing upper-income segments (to a lesser extent)
- Ethnic mobility, particularly evident in the upward movement of black consumers to LSM segment 7 to 10
- Gradually increasing urbanisation
- A relatively youthful, but gradually aging population
- Overall improved education levels over time, yet questionable education quality
- Some decrease in unemployment over time
- High levels of consumer debt
- Cross-cutting nutritional concerns among socio-economic sub-groups focus on overweight / obesity and non-communicable diseases, 'fuelled' by consumer behaviour related to unhealthy diets, high intake of refined foods and fatty food-away-from-home meals, physical inactivity, tobacco use and harmful use of alcohol.

Dominant food preference trends in the global food landscape

Due to the spill over of international consumer food trends into the local consumer market, it is critical to understand the current global agro-food consumer trends. This section provides an overview of prominent global consumer food trends, based on a literature review of trends identified by International 'trend spotting' organisations*. The mega-trends such as health / well-being, convenience, indulgence and sustainability have been around for many years. However, the specific manifestations of these trends change over time.

<table>
<tr><th>Mega-trend:</th><th colspan="2">Sub-trends, manifestation examples:</th></tr>
<tr><td rowspan="10">Health and well-being

<u>Summary of main points related to trend:</u>
• Restoring balance
• Reducing obesity levels
• Confused consumers – better labelling and consumer education
• BFY (better-for-you) products (e.g. natural, organic, unprocessed, low/ no sodium, low/no sugar, low/no fat) BUT must be tasty (consumers not compromising on indulgence)</td><td>A long-term approach</td><td>Movement towards a lifestyle / long-term approach to wellness, moving away from 'restrictive fads' and allowing the occasional 'indulgence treat'.</td></tr>
<tr><td>The confused consumer</td><td>Consumers are often confused about nutrition claims and do not trust the claims. Need for communication of health benefits simply and effectively within legislative guidelines. Consumers also need to be educated to understand why certain ingredients are in products.</td></tr>
<tr><td>High protein diets very popular</td><td>Increased launches of 'high protein' food products.</td></tr>
<tr><td>Low carb, high fat diets</td><td>Butter, despite containing saturated fat viewed as a 'good fat' due to its natural food image.</td></tr>
<tr><td>Naturally healthy</td><td>Continued growth for fruit and vegetables as part of meals and snacks.
Growth in fruit-based snacks and fruit-based ingredients.</td></tr>
<tr><td>Healthy snacking</td><td>Significant growth in US popcorn market driven by health, convenience & 'cool' product image.</td></tr>
<tr><td>More of the 'good'</td><td>Increased launches of 'high fibre' / 'added fibre' food products.
Consumers want more 'nutrients per bite'.
More food with natural goodness.
Good 'carbs; – natural occurring sugars better than added cane sugar or sweeteners.</td></tr>
<tr><td>Less of the 'bad'</td><td>Less highly processed food.
Less sugar, less salt.
Gluten-free.</td></tr>
<tr><td>Dieting, weight loss</td><td>Calorie counts on food-away-from-home menus.
Less sugar, carbohydrates, fat.
Use apps to monitor diet and exercise.</td></tr>
<tr><td>Other:</td><td>Rise of novel protein sources – e.g. algae.</td></tr>
</table>

Mega-trend:	Sub-trends, manifestation examples:	
Indulgence ***Summary of main points related to trend:*** • A 'celebrity chef' in my own kitchen – 'aspiring gourmands' • Keep it interesting, e.g. ethnic food, unique flavours, texture • More simplistic indulgence.	Rise of the 'foodie' / 'aspiring gourmands'	Growing interest in cooking at home like a 'celebrity chef, fuelled by television cooking shows. But all consumers don't have the skills to do this, thus creating a need for products making home cooking easier, but still wholesome and high in quality. For 'foodies' food-away-from-home is about more than nourishment, it is also about a 'one-of-a-king' experience.
	Interesting combinations	Food-away-from home: authentic flavours, fresh herb combinations, unique sauce pairings.
	Ethnic food	Increased demand for unique ethnic and international flavours
	Hot / spicy food	Hot & spicy meat dairy snacks
	Speciality products	Rise of 'craft' or 'small batch' foods - perceived higher quality
	'Real deal' sugar	Some consumers want the 'real deal' when indulging in a treat, e.g. real sugar not sweetener (also linked to transparency and naturalness)
	Texture	Texture of food receiving more attention than before.
	Using Internet purchasing to indulge	US consumers tend to use the Internet to purchase hard-to-find (more exclusive) products such as exclusive wine or overseas chocolates.
	Natural and tastier	More natural, less processed food perceived as healthy, better tasting.
Convenience ***Summary of main points related to trend:*** • Healthy snacking rather than meals • Helping the 'foodies' cook at home • Natural convenience fuelling demand for fruit and vegetables	Snacks replacing meals	Consumers are increasingly replacing meals with healthy snacks, but dealing with a complex consumer requirement: simple ingredients, low kJ value, healthy but tasty to satisfy 'cravings'
	Convenience for 'foodies'	Innovative products making it more convenient to cook like a chef.
	Frozen food	Growing interest in frozen food, associated with locked in freshness, convenience and less waste.
	'Natural' convenience foods – fruit and vegetables	Certain fruit and vegetables viewed as convenient & healthy meal components and snacks. Growing demand for time- and step-saving fruit and vegetables products that align with consumer need for convenience.
	More convenient red meat	Convenience an important driver behind new product launches in red meat. Microwaveable meat speeds up preparation time (UK).

Mega-trend:	**Sub-trends, manifestation examples:**	
Naturalness ***Summary of main points related to trend:*** • More natural ingredients • Naturally healthy foods	More natural ingredients	Sugar from two perspectives * Natural high-intensity sweeteners, such as stevia and monk-fruit, expected to benefit from negative associations with sugar. * Due to possible links between high fructose corn syrup and obesity/cancer, some US brand are changing to 'real' sugar (cane/ beet).
	Naturally healthy foods	Fruit and vegetable interest driven by natural goodness. Return to foods with natural intrinsic health benefits, and thus less heavily processed products.
Sustainability ***Summary of main points related to trend:*** • Linked to food transparency • Less damage to the environment • Less damage to the human body	Reduced food waste	Legislation forcing food companies to reduce food waste. Growing demand for frozen food where there is a smaller chance of food being wasted.
	Considering environmental impact	Relates to the behaviour of both food companies and consumers. Linked to food transparency. Non-GMO food.
	Origin of food	Demand for locally produced food still important and growing.
Food transparency ***Summary of main points related to trend:*** • Traceability • Sustainability • Corporate responsible behaviour • Clean food labels	Food transparency is linked to various dimensions such as: • Traceability • Sustainability (environmental, social, etc.) • Consumers' interest in responsible behaviour by food companies. • Consumer education to help them understand what ingredients do in food products. • 'Clean' food labels, i.e. clear and easy to understand food labels without 'complicated' ingredient names The demand for 'Clean' food labels is driving innovation, e.g. functional clean label starches that perform like modified starches, but can simply be listed as 'starch' on food labels.	
The influence of the 'Millennials'	The 'Millennials' – aged 15 to 35 represent a third of world population and is viewed as an important food consumption group. These consumers are likely to be well informed, try something new, interested in the story behind products and are less likely to be loyal to specific brands.	
What is 'value'?	Redefining value: Traditionally lower quality cheaper products were viewed as 'value', but lately affordable products with added 'amenities' falls within the definition of 'value'. Thus, what are consumers getting for their money, and not necessarily the cheapest option on the market.	
Private labels (supermarket brands)	Private labels are growing, but also diversifying. These products traditionally involved plain packaging and lower quality. However, the new movement is towards trendy, great value, great taste, great shelf appeal Improved quality, more variety, better appearance. Also towards more premium private label options. There is however a need to educate older consumers who still perceive private label options as low quality.	

Mega-trend:	Sub-trends, manifestation examples:	
The growing impact of food legislation	Implies changes in food industry behaviour and consumer perceptions and behaviour.	Example: According to the new Food Information for Consumers regulations (EU) the specific vegetable oil used in a product has to be stated on the food label, which could cause consumer to reject the ingredient and thus the product linked to health or sustainability concerns.
The growing impact of the Internet and social media	Driving more positive product perceptions.	Social media offers a potential channel for poultry role-players to communicate the high standards of living of their poultry, eg through video footage on social media.
	Consumer support'	Online and mobile app support to 'budding home cooks'.

** 'Trend-spotting' organisations monitored for information: Mintel, Euromonitor, Innova, Rabobank*

Dominant preference trends in the South African food landscape

New food products are developed to address consumers' needs, which are in turn strongly affected by consumer preference trends. Thus in order to investigate the leading food trends in South Africa, this section presents an analysis of preference trends reflected in new food products launched on the South African market since January 2013 which were entered into the Symrise / Food Review New Product Competition (NPC) in 2014 (Food Review magazine, various articles). Results are also compared with previous years (Tables 3.5 and 3.6). The latest analysis covered the following product categories: savoury snack foods (e.g. potato chips, popcorn), alcoholic beverages, non-alcoholic beverages, baked goods, breakfast food, dairy (e.g. cheese, ice cream), sauces, chocolate, energy drinks, cooking ingredients (e.g. egg white, edible animal fats), pizza, cooking oils (e.g. olive oil) and meal replacement bars.

Most of these products are most likely targeting the upper middle and wealthy consumer segments. Among the 2014 new products the most prominent trends (in order of importance) were indulgence, closely followed by convenience and health, similar to previous years.

The prominence of multiple positioning strategies, where products are based on two or more food trends to better target consumers' complex needs, should be noted. Among the 2014 new products the most prominent trend combinations included:

- Indulgence + Convenience: 18%
- Health + Convenience: 18%
- Indulgence + Health + Convenience: 18%
- Indulgence + Health + Convenience + Local: 14%

Table 3.5: Consumer food trends addressed by the Symrise/Food Review New Product Competition (NPC) products, 2006 – 2014*

Main trend:	Share of new products in specific year								
	2014 (n=22)	2013 (n=16)	2012 (n=20)	2011 (n=6)	2010 (n=20)	2009 (n=6)	2008 (n=8)	2007 (n=9)	2006 (n=10)
Health	64%	75%	55%	83%	50%	83%	38%	33%	60%
Convenience	77%	75%	85%	67%	75%	67%	38%	56%	70%
Indulgence	82%	94%	95%	83%	80%	67%	50%	89%	80%
Local	32%	13%	10%	33%	20%	33%	25%	11%	-
Sustainability	18%	6%	15%	17%	20%	17%	-	-	10%

** Percentages in columns add up to more than 100% due to 'double-positioning' in food products.*

Table 3.6: Consumer food trend manifestations among the 2014 Symrise Food Review New Product Competition (NPC) products

Main trend:	Trend manifestations :
Indulgence	**Most prominent manifestations:** * Extensive, tasty and interesting product range options
	Other examples observed: * Luxurious products * Special 'cooking' techniques, e.g. kettle cooked potato chips * Texture indulgence, e.g. 'puffy' chips, crunchy snack bar * Interesting product format, e.g. mozzarella cheese strings * Unusual product combinations, e.g. fruit flavoured beer and wine
Health / well-being	**Most prominent manifestation:** * 'Minus' claims (less / no 'bad' ingredients), e.g. No artificial colorants, No preservatives, Less salt, low in fat, less fat, lower alcohol content, gluten-free, no added cane sugar, less sugar, egg-free, dairy-free
	Other examples observed: * 'Naturally' healthy food, e.g. extra virgin olive oil * High protein food, e.g. speciality snack bar * Numerous added vitamins and minerals, e.g. breakfast cereal * Balanced portion size format, e.g. ready-to-heat French toast * 'Good fat' * Safe food, e.g. pasteurised egg white * Low GI, e.g. breakfast cereal
Convenience	**Most prominent manifestations:** * Convenience associated with a wide product range choice * Ready-to-eat / Ready-to-heat-and-eat / Ready-to-bake foods
	Other examples observed: * Product usage convenience, e.g. tap on olive oil, ten 10g popcorn seasoning sachets in one packet, pre-separated frozen egg white, easy-to-open packaging. * Portion-size packaging
Local food focus / Origin	* Marula fruit in alcoholic beverage & chocolate bars * Locally produced canola oil in speciality mayonnaise product
Sustainability:	* Non-GMO grain in breakfast cereal. * Locally produced ingredients, e.g. canola oil in mayonnaise. * Commercially sustainable and community uplifting food marketing. * Reduced food waste, e.g. soft serve ice cream mix not requiring refrigeration with 9 month shelf life.
Culture	* Greek phyllo pastry sweet and savoury treats (frozen and ready-to-bake) * Italian pizza (ready-to-bake with significantly lower fat content) * Marula-based alcoholic beverages

South African Outlook

SUMMER GRAINS

As record harvests continue to materialise in key production regions, global maize production is set to reach record levels for the 2nd consecutive year in 2014/15, despite a reduction in area planted. Having already plummeted by more than 30% from 2013 highs, maize prices are projected marginally lower again in 2015, inducing a further consolidation of maize area in 2016.

Global maize situation and trends

As record harvests continue to materialise in key production regions, global maize production is set to reach record levels for the 2nd consecutive year in 2014/15, despite a reduction in area planted. Having already plummeted by more than 30% from 2013 highs, maize prices are projected marginally lower again in 2015, inducing a further consolidation of maize area in 2016. Despite the projected lower plantings and a return to more normal yields, prevailing stock levels remain high and consequently, lower prices will be sustained in the short term. A gradual recovery is expected towards 2020, as global maize demand, driven largely by the animal feed market, rises above production levels. Barring extreme weather conditions, world production is projected to overtake the growth in demand again towards the end of the baseline period, which may result in a marginal decline in international prices (Figure 4.1).

Domestic summer grain situation and trends

South African maize producers planted approximately 100 thousand hectares less white maize and 68 thousand hectares more yellow maize in 2015 relative to 2014 (Figure 4.2), resulting in a marginal decline of 1.3% in total 2015 maize plantings. This corresponds to the general trends in maize plantings that BFAP has been projecting for a number of years.

Contrary to global trends, South African maize prices increased significantly since the beginning of 2015 as dry and hot weather during the growing season led to well below average yield levels. The 2015 domestic maize crop is expected to reach only 9.8 million tons, which is 31% less than the 14.2 million tons harvested in 2014.

The impact of the drought early in 2015 was more severe in the western parts of the maize production regions, where proportionally more white maize is produced compared to the eastern and irrigation areas, which tend to favour yellow maize. The disappointing yields, together with the reduced area planted to white maize, resulted in a decline of 39% in white maize production, reaching merely 4.7 million tons in 2015. The prevailing 2015 white maize price is well supported by concerns related to the domestic supply, yet prices have not increased sufficiently to allow for white maize imports from Zambia, which represents the only current available source of surplus

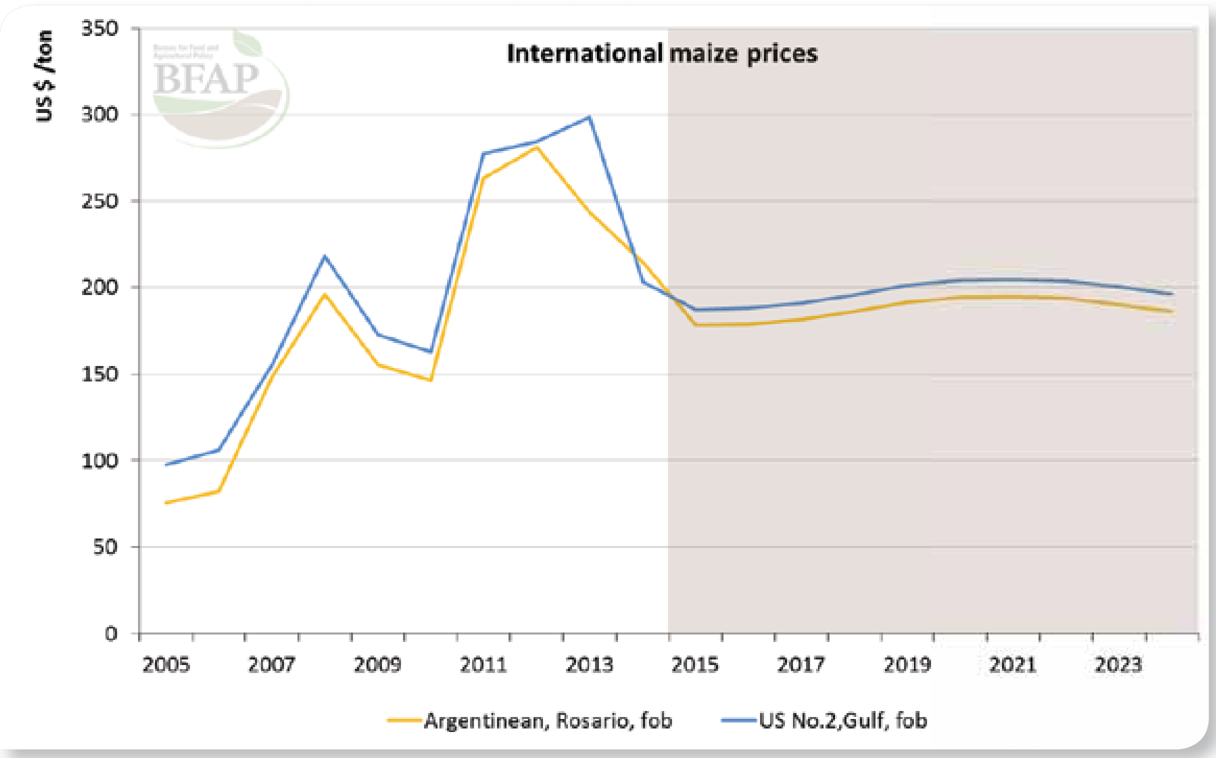


Figure 4.1: *Yellow maize world prices*
Source: FAPRI & BFAP

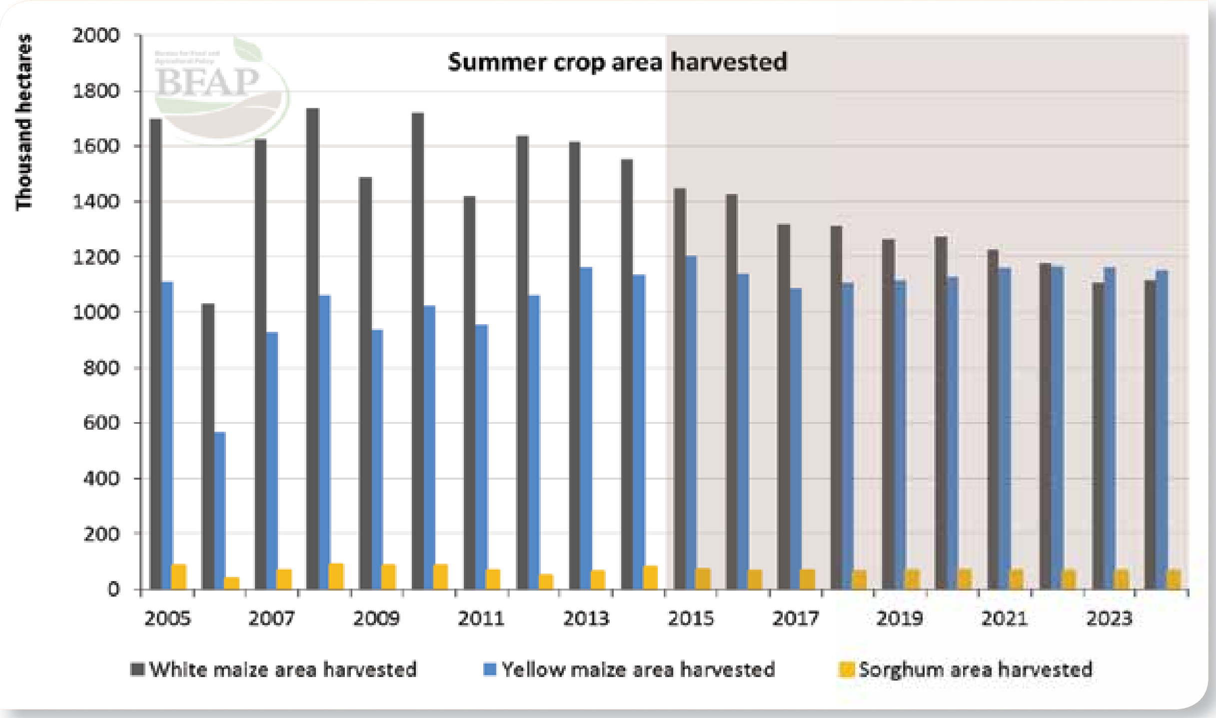


Figure 4.2: *Summer grain area harvested*

white maize. Over the years, the relatively constant volumes of white maize flowing across the border to the neighbouring countries such as Lesotho, Swaziland and Mozambique, have almost come to be regarded as a part of the South African white maize market and therefore, even under drought conditions like this current season, South Africa still remains a small net exporter of white maize (Figure 4.3).

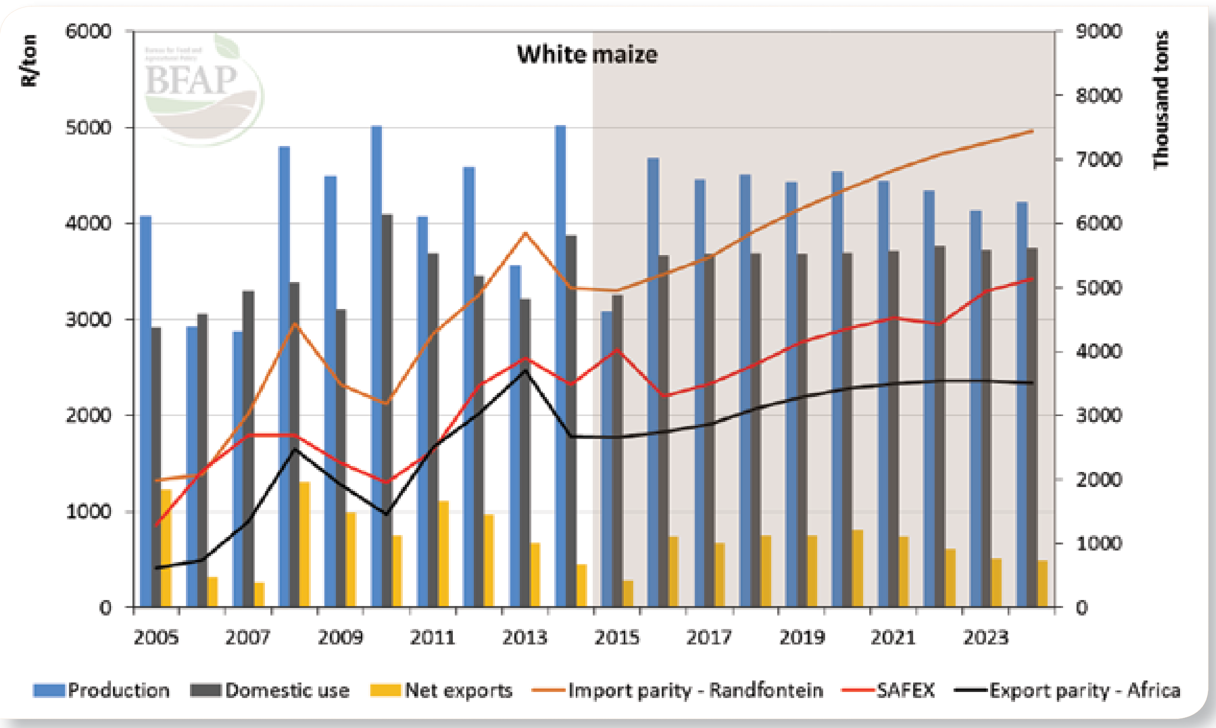


Figure 4.3: *White maize production, domestic use, net trade and prices*

White maize plantings are projected to decline by a further 45 thousand hectares during the coming season, as the expected higher prices will be insufficient to offset the loss in yields during the 2015 season, resulting in lower gross returns from white maize production. Nonetheless, white maize production in 2016 might still amount to 6.9 million tons if normal trend yields are obtained and consequently prices will move closer to export parity levels (Figure 4.3). Over the rest of the baseline period, white maize plantings are projected to continue their declining trend, but South Africa will remain a net exporter as growth in yields is expected to be sufficient to ensure ample supply for human consumption, a market that remains stagnant over the outlook period (Figure 4.4). In contrast, substantial growth is projected in the animal feed sector, the bulk of which traditionally consists of yellow maize. The potential for further value adding and alternative uses for maize is speculated on in Box 4.1.

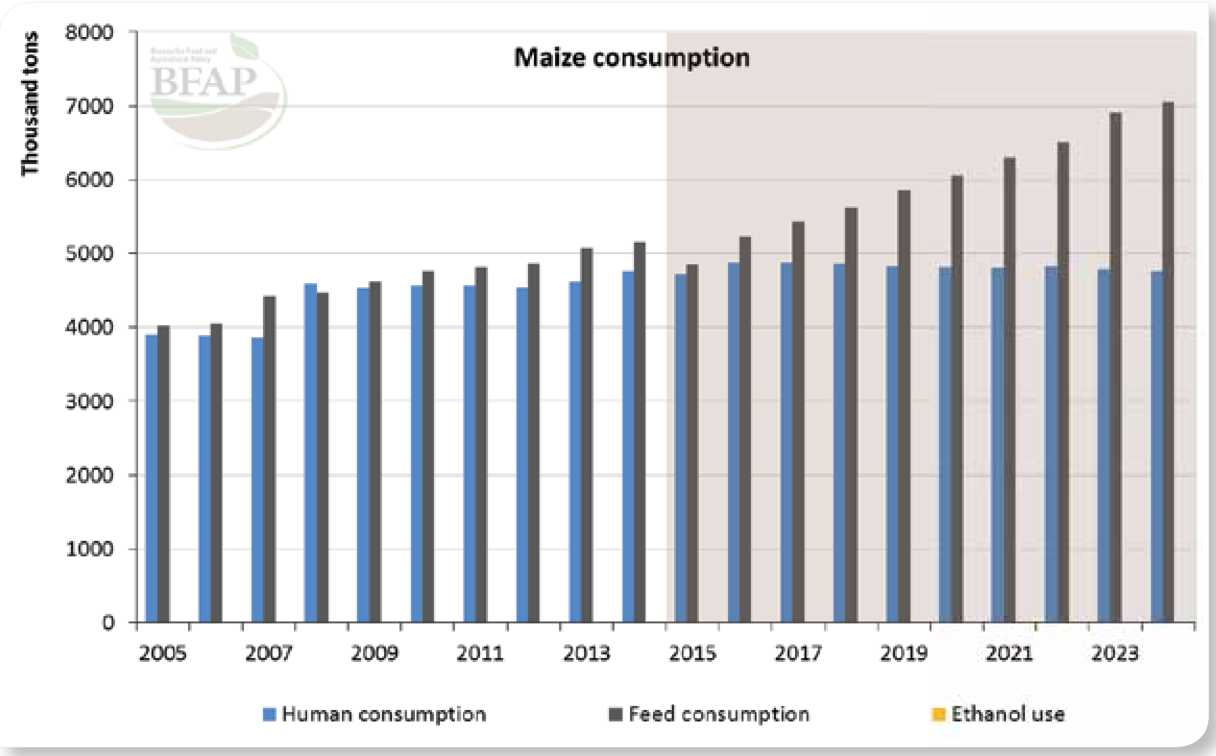


Figure 4.4: *Maize consumption in South Africa*

Box 4.1: A perspective on South Africa's potential to produce value added maize products[6]

In light of the fact that South Africa has remained a net exporter of maize for several seasons and is projected to remain in a net exporting position over the coming decade, BFAP recently undertook a study for the Maize Trust related to the potential of the domestic value chain to grow and diversify the production of value added goods. Traditionally, leading maize consumers such as the United States exhibit greater diversity in the consumption structure, whereas in South Africa, the bulk of maize is utilised as animal feed (38.4%) and food (36.1%) products. Exports accounted for 17.3% of the 2013/14 maize crop in South Africa, with the balance of 4.6% being utilised in the production of starch and glucose (Figure 4.5). In the United States, biofuel production (38.2%) and animal feed (37.5%) accounts for the bulk of the domestic market, with exports accounting for 14.3% of domestic production. The remainder of the stock is used to produce products such as: starch, glucose and dextrose (3.9%); high-fructose corn syrup (3.6%); food and cereal products (2%) and alcohol for beverages and manufacturing (1%). Although the United States is a highly developed economy, the diversified nature of U.S. maize consumption raises the question of whether the South African maize value chain is optimally developed.

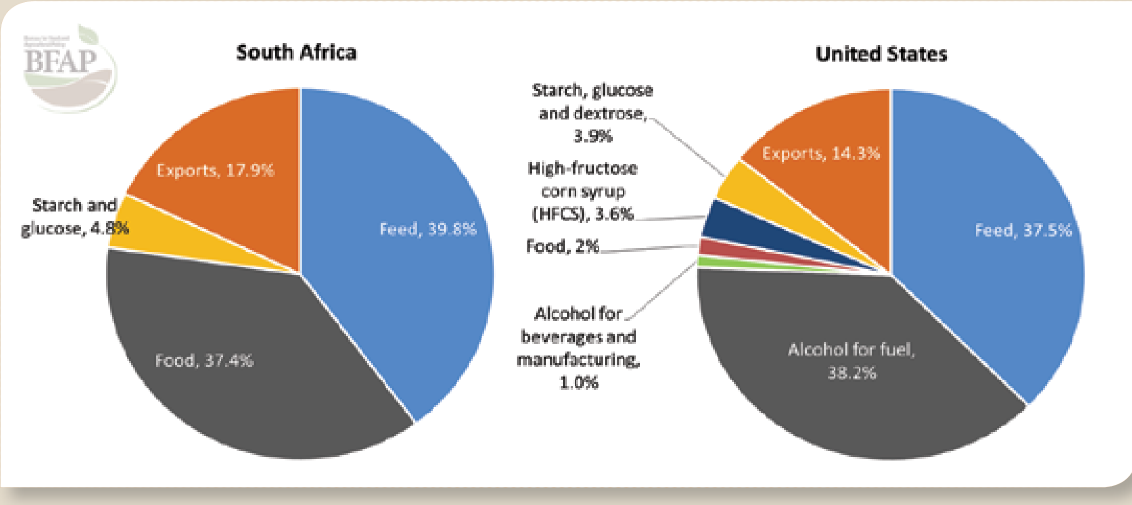


Figure 4.5: *Maize consumption in South Africa and the United States, 2013/14*
Source: SAGIS, 2015; USDA ERS, 2015

Figure 4.6 provides a high-level overview of South Africa's potential to add value to the currently exported surplus maize through the expansion of the food, animal feed, ethanol, maize starch and glucose-fructose syrup markets. The primary axis presents the potential tonnage that could be added to the various marketing channels based on the following:

- **Exports:** BFAP projects that maize exports will decline from 2.23 million tons to 1.96 million tons between 2013/14 and 2023/24. The main driver of this reduction is that growth in domestic demand for maize (especially yellow maize) will marginally outpace production growth.
- **Feed consumption:** Rising demand for animal based products is projected to drive feed demand growth by 2.3 million tons from its current level of 4.8 million tons to just over 7 million tons between 2014/15 and 2023/24. Assuming that 370 thousand tons of dark poultry meat imports could be substituted by 370 thousand tons of white poultry meat exports, a further 410 thousand tons[7] of maize could potentially be consumed by the South African poultry industry.
- **Food:** Due to the limited growth in the demand for maize-based food products, BFAP estimates that food consumption will continue to trend sideways over the next decade, only expanding by 90 thousand tons by 2023/24.
- **Starch and glucose:** Assuming the country utilizes the available 20% wet-milling capacity, a further 150 thousand tons of maize can be used in the production of starch and glucose products.
- **Glucose-Fructose Syrup (GFS):** Industry sources indicated that between 350-400 thousand tons of sugar is consumed by the South African beverage industry. Under the following assumptions, BFAP estimates that 581 thousand tons of maize can be consumed should GFS replace 350 thousand tons of sugar in the domestic beverage industry:

- 1 ton of GFS replaces 1 ton of raw sugar, based on the perfect rate of substitution observed in the US between 1977 and 1988 (USDA ERS, 2015),
- 1.66 tons of maize is required to produce 1 ton of GFS (Gray, 1991).

- **Ethanol:** Maize is currently excluded as a feed stock within the South African Biofuels Industrial Strategy (BIS) due to food security concerns. Until such time that maize is included as a production crop in the BIS, it is not possible to legitimately produce maize-based ethanol in South Africa and the potential market space is therefore nought.
- **Total Potential:** In light of the above, the total additional space in the domestic market for maize in 2023/24 is estimated at 3.46 million tons (excluding the potential 410 thousand tons that could be consumed under a poultry export scenario).

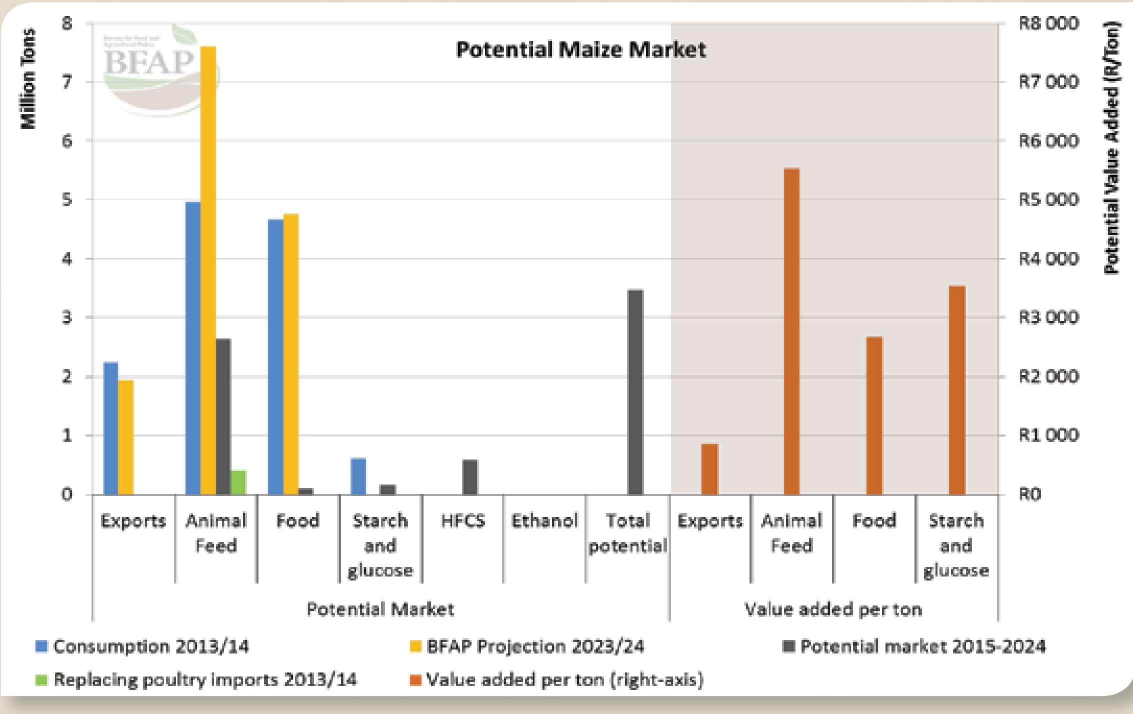


Figure 4.6: *Potential consumption and value added per ton of maize; 2013/14-2023/24*

On the secondary axis, Figure 4.6 illustrates the value that would be unlocked per ton of maize through the production of value added products. By calculating the difference between the average values of exported- and processed maize products from the average maize prices typically used to produce these products between April and September 2014, the following was observed:

- Exporting a ton of maize adds the least value among the products considered, only adding an additional R853 per ton.
- The production of "Super" maize meal adds on average R2662 per ton of white maize, whereas starch and glucose production adds on average R3529 per ton of non-GM yellow maize[8].
- One ton of yellow maize enables the creation of 1.54 tons of broiler feed, allowing the domestic feed industry to add an additional R5531/ton through further processing and adding additional inputs.

Based on this assessment it is thus clear that, given current market trends, the expansion of the domestic animal feed sector is the most economical way to add value to maize surpluses.

6 Extract from the report "Adding Value in the South African Maize Value Chain", compiled by BFAP for the Maize Trust in 2015

7 Assuming a feed conversion ratio of 1.7 and that maize constitutes 65 percent of broiler feed.

8 Assuming a R300 per ton premium for non-GM yellow maize.

While the impact of the drought is expected to be less severe for yellow maize compared to white, local yellow maize production is still expected to decrease by 1.4 million tons or 22% to 5.1 million tons in 2015. Prevailing white maize prices are trading at a significant premium to yellow maize, resulting in less white maize being consumed by the animal feed sector than in 2014. Demand for animal feed remains firm and consequently the domestic consumption of yellow maize in 2015 will be higher than the previous season. Relatively lower beginning stock levels and a smaller domestic crop combine to move South Africa to a net import position during 2015 (Figure 4.7).

The bulk of the imports will be used to supply animal feed factories in the coastal regions. Therefore yellow maize prices are expected to trade at coastal import parity levels just long enough to allow sufficient imports to these factories before retreating to a lower average price level. Given the limitations in domestic supply, prices will remain sensitive to exchange rate fluctuations and international price levels until the market has more clarity about new season supplies.

Like white maize, yellow maize plantings are projected to decrease in 2016 but if growing conditions permits a return to trend yields, the local yellow maize crop could reach about 6 million tons. In this case, South Africa will return to a net exporting position with prices moving closer to export parity levels once more (Figure 4.7). The lower prices projected in 2016 are expected to impact negatively on 2017 plantings. However over the long term, yellow maize plantings are projected to expand, in order to supply the growing demand of the animal feed sector (Figure 4.4). While prices are projected to trade closer to export parity levels in the medium term, the prevailing market conditions in 2015 are indicative of the potential impact of climate variability. In this regard, Box 4.2 illustrates the potential impact of changes in climate conditions on crop production patterns and food security in South Africa.

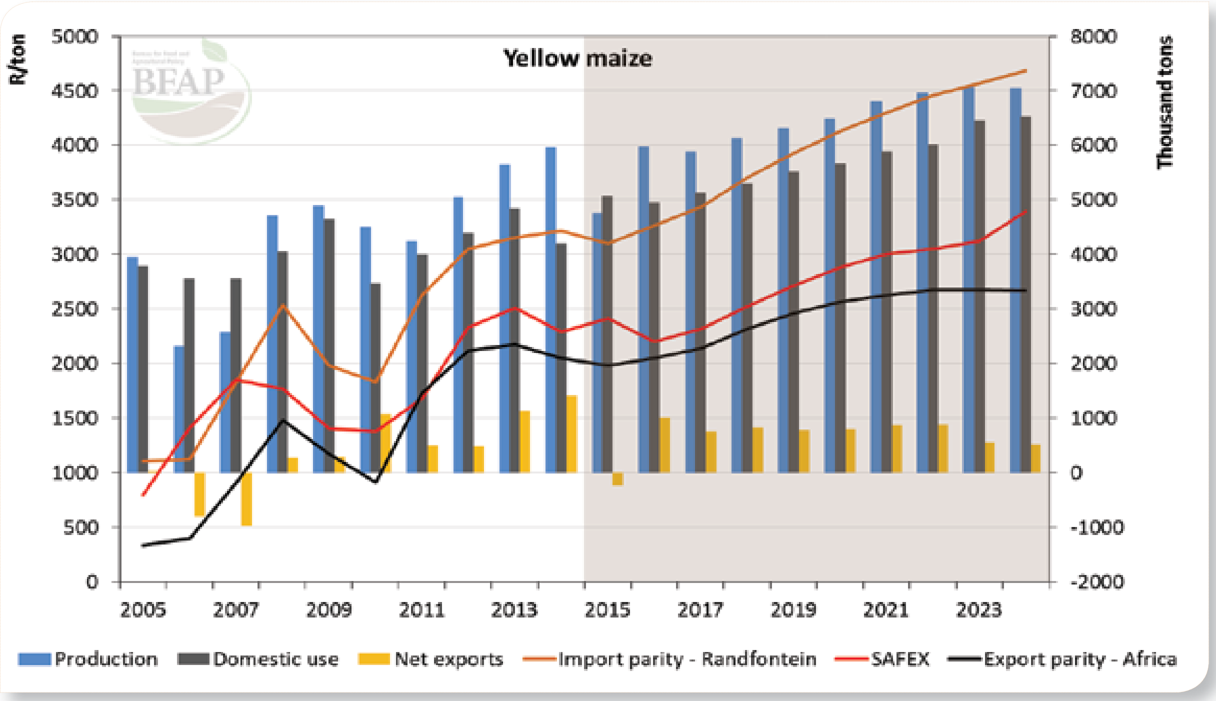


Figure 4.7: *Yellow maize production, domestic use, net trade and prices*

Box 4.2: Climate Change Adaptation: Perspectives on Food Security in South Africa

Numerous studies have been conducted on the potential effects of climate change on agricultural production in South and Southern Africa, particularly in the maize and wheat industries. These studies typically investigate the impact of climate change on productivity and suitability as the impact on yield and the increase or contraction of suitable production areas. Whilst relevant, these results do not take the economic and social impact of climate change into account. An integrated approach considering these factors is essential for the evaluation of the food security impacts of climate change given the importance of prices as a driver of the production decision and food accessibility.

BFAP was commissioned to do a study on "*Climate Change Adaptation: Perspectives on Food Security in South Africa*" that forms part of the larger "*Long-Term Adaptation Scenarios Flagship Research Programme (LTAS)*" headed by the South African Biodiversity Institute (SANBI). The study evaluated the impact of four possible climate scenarios on the South African maize and wheat industry for the period 2014 to 2030 in order to deliver high level policy messages on possible food security and employment impacts.

For the purpose of this study the data for each climate scenario (monthly precipitation per quaternary catchment) was isolated according to the respective production regions and the months within the relevant growing period were isolated for inclusion in the model. One of the most interesting findings was that the climate model with the smallest expected decline in mean annual rainfall, the warmer/drier Max Planck Institute for Meteorology (MPI 4.5) model, had the greatest impact on the maize and wheat production regions, again emphasising the challenge of inferring national impacts from nationally averaged projected climate change and the importance of the timing of rainfall over averages.

The BFAP model utilizing the climate data from the MPI 4.5 model which showed a decline in rainfall during the summer months in the maize producing areas, resulted in a projected decrease in maize yields. White maize yields for example, are anticipated to decline by 1.1 ton per hectare on average over the outlook period, resulting in a drop in total production of approximately 1.6 million tons per annum and an increase in the white maize price of 16%. Given this increased price environment farmers opt to increase white maize production by expanding the area planted. This does not result in an absolute increase in the area planted but rather in a smaller decline (about 200 000 hectares) than was forecast in the base scenario.

Conversely the MPI 4.5 climate model forecast an increase in annual precipitation during the winter months in the summer rainfall wheat producing areas (mostly the Free State) that results in a projected yield increase of more than 1 ton per hectare. This increase in yield does not result in an increase in the area planted to wheat due to the greater relative profitability of maize production for the reasons discussed above. In the winter wheat producing areas (the Western Cape) the projected results show a small decline in precipitation during the winter months resulting in a decline in yield. Collectively these changes result in a projected decline in total wheat production of just over 100 thousand tons per annum relative to the base. This does not result in a change in domestic prices, however, since wheat prices are at import parity price levels and are expected to remain there given the fact that close to 50% of wheat consumed in 2013 was imported. The expansion of wheat imports and possible contraction of maize exports would have a negative impact on the agricultural trade balance.

The results highlighted above do not represent probable future scenarios but rather possible ones. The contribution of this study is therefore not to be found in the absolute results but rather in the broad principles illustrated: The results underscore the importance of the locality and timing of rainfall in determining yield effects due to climate change. The study also highlights the importance of an integrated approach that includes economic modelling, with substitution effects, when considering impacts. Previous studies only estimate changes in crop yield and production suitability, and do not take the effects of price changes on the production and crop substitution decision into account. The expansion of maize area planted due to increased profitability brought about by declining yield but increasing prices, regardless of increasing wheat yields, serves as an excellent example. Climate chance effects should not be viewed in isolation since they form part of existing trends within the production system. Examples of these trends include rising long term crop yields, changes in consumption patterns and changes in the relative profitability of different commodities. Furthermore, these results represent a worst case scenario, since the implicit assumption is made that no adaptation take place, while in reality, producers are continually adapting to climate and other factors and similarly seed breeders will adapt seed breeding programs. From a mitigation and food security perspective, the results underscore the importance of investment in transport infrastructure in order to ensure that primary food items can be distributed as efficiently as possible in order to ensure the availability of these items at the lowest possible price, thereby ensuring the greatest possible access.

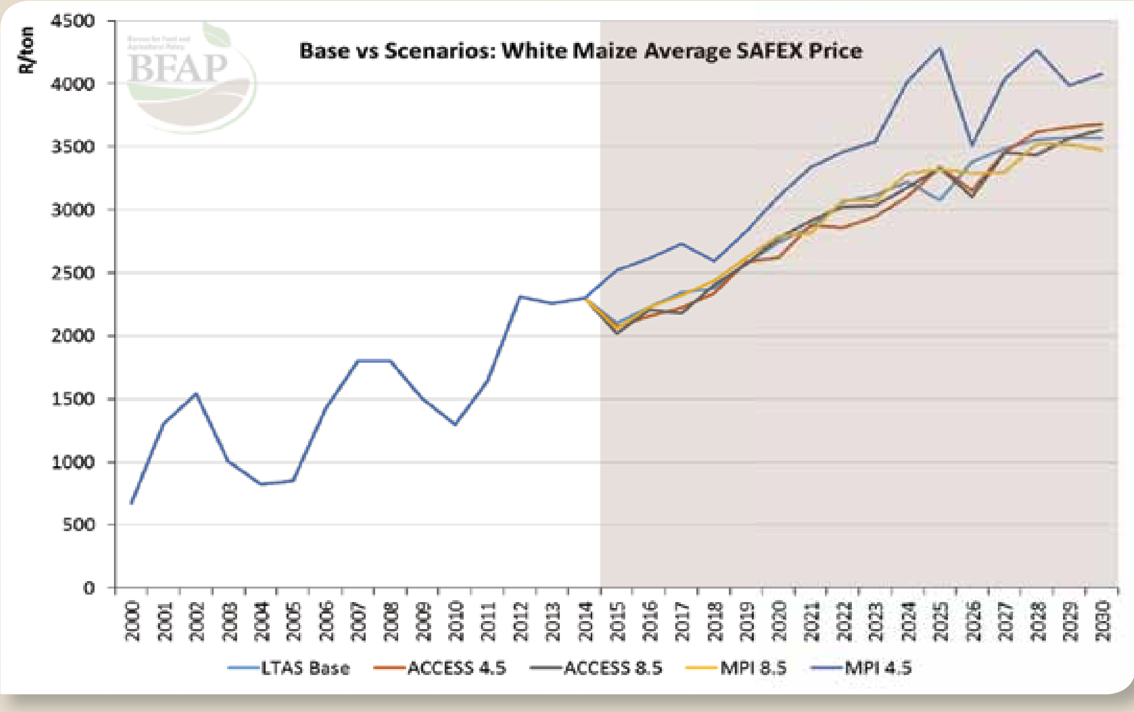


Figure 4.8: Base versus climate scenarios: white maize average South African Futures Exchange (SAFEX) prices

Domestic sorghum situation and trends

Just more than 70 thousand hectares of sorghum was planted during 2015, 10% less than the 79 thousand hectares planted the previous season. Yields obtained during 2015 were disappointing due to the drought and local production is expected to be less than 140 thousand tons. Domestic use of just over 200 thousand tons implies a shortfall of more than 60 thousand tons, the bulk of which will be supplied from the substantial carry-over stocks from the strong 2014 crop. Since total supply of sorghum will

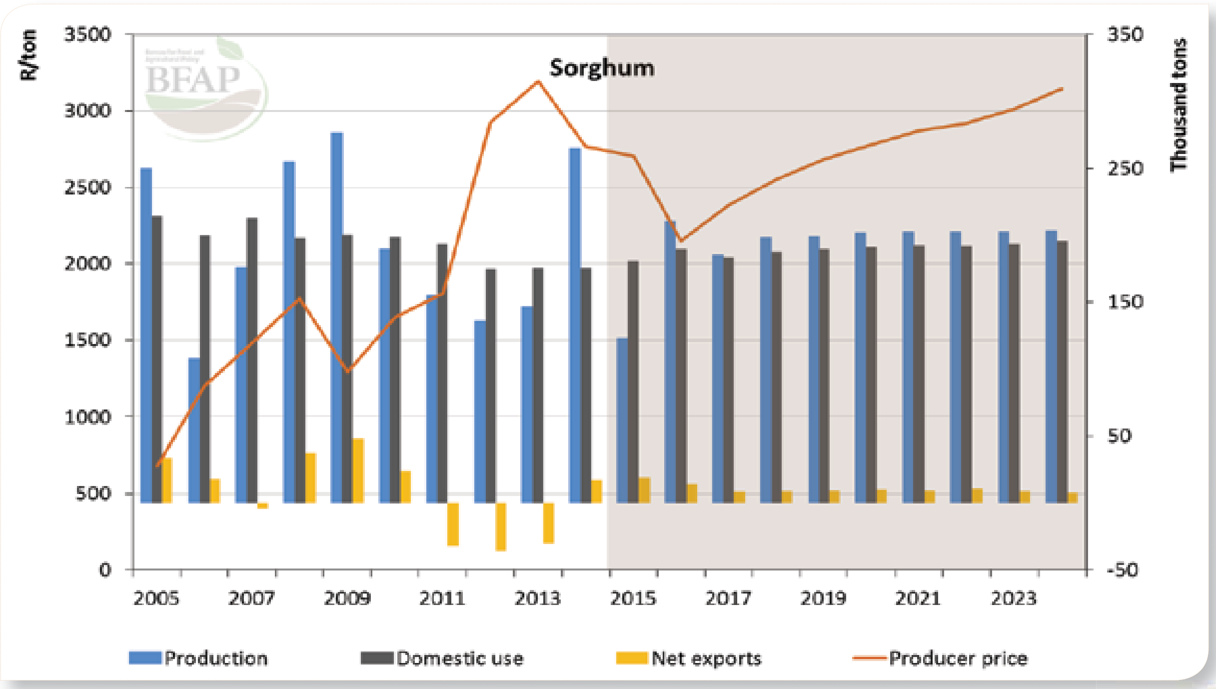


Figure 4.9: Sorghum production, domestic use, net trade and prices

likely meet the domestic demand, prices are expected to trade marginally lower on average compared to 2014 (Figure 4.9). The local sorghum acreage in the coming season is expected to decline only slightly to 68 thousand hectares but a return to trend yields could result in a domestic crop of 240 thousand tons in 2016 which will put local prices under downward pressure (Figure 4.9). Over the long run, sorghum plantings will fluctuate around 70 thousand ha, which implies that at trend yields, the local market will be finely balanced with just enough sorghum produced for local consumption.

Box 4.3: Mandatory Blending of Biofuels with Petrol or Diesel

The National Biofuel Industrial Strategy, approved by Cabinet in 2007, has seen a number of additions, one of which is legislation that mandates a 2% level of biofuel that will penetrate the current fuel pool in South Africa from the 1st October 2015. This is par to the overall goal of creating a biofuels sector which strategically prioritises investment in rural areas, in an effort to stimulate agricultural development, whilst simultaneously reducing the dependence on imported fuel. It seeks to ensure the sustainable development of the biofuels sector, due to its potential in providing emerging farmers with new opportunities (DoE, 2007a).

Whilst being a popular feed stock in international biofuel markets, maize has been excluded from the biofuel sector due to food security concerns. Consequently, grain sorghum and sugarcane represents South Africa's leading contenders in potential commercial ethanol feed stocks. The minimum recommended plant capacities for these feed stocks would amount to 158 000m3/annum and 95 000m3/annum respectively (DoE, 2007b).

Sorghum as a source of ethanol in South Africa

The production of bioethanol from sorghum has already been anticipated, with planned processing plants to be located in Bothaville and Cradock. Whilst considerable research and planning has been directed towards these plants, no firm commitments have been made related to their construction and without certainty related to the pricing environment and clear policy guidelines related to pricing and support for biofuel production, it is unlikely that any firm will invest in constructing such plants. Furthermore, based on purely economic principles the potential of sorghum as a feed stock remains somewhat contentious, as illustrated in Figure 4.10, which presents two scenarios. In the first scenario, ethanol demand is added to the sorghum market, with the industry yields at rates comparable to the past decade. In such a scenario, gross returns from sorghum production will increase due to higher market prices, but would still not match returns from maize. Consequently, there will be insufficient incentive for producers to switch to sorghum production. Whilst some expansion will occur, it will be insufficient to meet bioethanol demand. In the second scenario, it is assumed that yields can increase by 30% relative to the baseline due to significant investment in breeding programs and production technology. This represents the level required for gross returns from sorghum production to become comparable to maize, incentivising sorghum production. Furthermore, the licencing requirements for bioethanol production indicate that sorghum produced for bioethanol would need to come from areas that were not previously under maize cultivation.

The biofuel industry strategy is driven by the need to address issues of poverty and economic development. Hence the focus rests on promoting farming in previously neglected areas as well as those lacking market access for their produce. Consequently, the proposed expansion in feedstock production would be concentrated in underutilised land available in the former homelands.

Conclusion

With a minimum of two years required for a biofuel plant to be constructed, the South African Department of Energy needs to finalise the regulations before any firm investment decision will be taken regarding the construction of the processing plants. Needless to say, the target blending rate of 2% will not be met from local supplies of biofuels by the 1st October 2015.

Large amounts of resources have to be spent in supporting the development of this industry and the official signing off of the support instruments has been lagging behind. According to Blaine (2014), a levy of 4.5 cents per litre will be imposed to provide a solid foundation for this industry, boosting economic development and employment in the country.

Surplus government commitment is required for the successful implementation of the strategy. The goals of the National Departments of Energy; Agricultural Forestry and Fisheries as well as the national treasury would have to be aligned if success is to be achieved in the implementation of the biofuel industrial strategy.

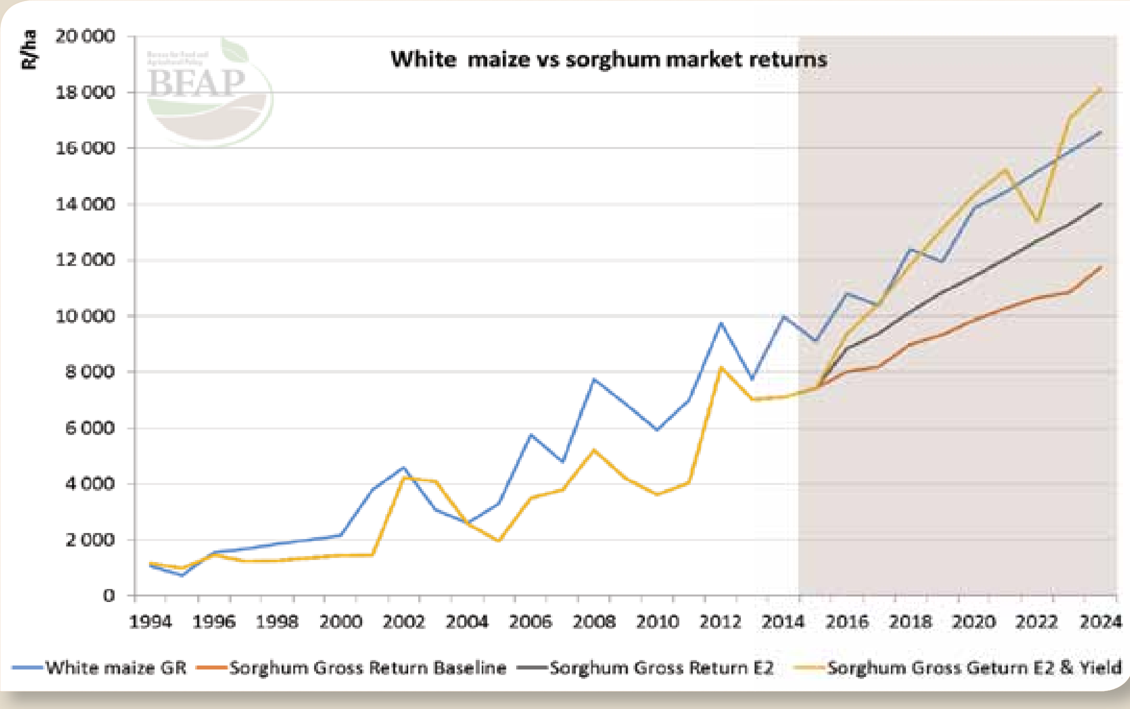


Figure 4.10: Maize and sorghum gross returns

South African Outlook
WINTER GRAINS

Global wheat prices continued to slide in response to bumper crops in South America, the EU and the Black Sea region, resulting in a global surplus. Despite this decline, the average SAFEX wheat price is projected to rise above R3800 per ton in 2015.

Global cereal situation and trends

Global wheat prices continued to slide during 2015, as world wheat production reached a new record. Whilst output from exporting countries such as the USA and Canada declined during 2015, significantly larger crops produced in the EU, Russia, Ukraine, Argentina, Brazil, China and India more than offset the reduction, resulting in surplus production. Global wheat stocks in 2015 were calculated at 28.1% of global demand compared to 26.8% in 2014. Within this well stocked market, international prices declined during 2015 and are projected to remain under pressure in the short term. The price of USA Hard Red Winter wheat is expected to stabilize at approximately $235 per ton in 2016 and 2017, before finding support from consolidated production and higher demand from 2018 onwards (Figure 5.1).

Expansion of the global beer market has supported the demand for malting barley and trade in barley malt remained strong despite the softer international economic growth. At the same time, the market remains well supplied with malting barley which, combined with the decline in other grain prices, resulted in a further decline in international malting barley prices in 2015. In light of the competition for hectares, global barley prices are projected to follow a similar trend to wheat over the outlook period (Figure 5.1).

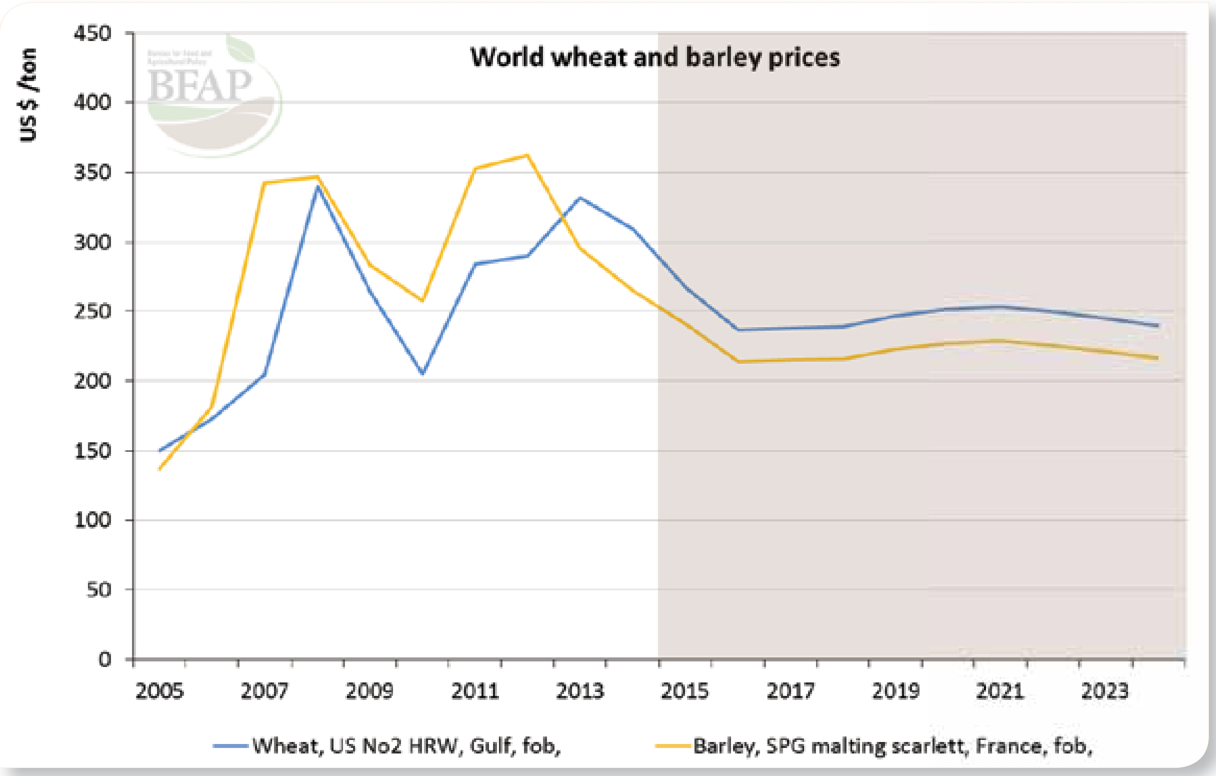


Figure 5.1: *World winter grain prices*

Source: FAPRI & BFAP

Domestic winter grain situation and trends

South Africa harvested almost 1.8 million tons of wheat on 477 thousand hectares in 2014. The winter rainfall area accounted for 310 thousand hectares, with a further 70 thousand hectares planted in the summer rainfall area and 97 thousand hectares under irrigation (Figure 5.2). The total area under wheat is projected to remain relatively stable in 2015, as returns find support from the variable import tariff that is triggered when world prices drop below the $294 mark. Over the longer term, wheat area in the winter rainfall areas (Western Cape Province) is projected to decline by approximately 40 thousand hectares, as producers progressively incorporate canola, in what is considered to be a more sustainable crop rotation system. Area in the winter rainfall region is projected to consolidate around 265 thousand hectares by the end of the baseline period (Figure 5.2). Within the summer rainfall regions, wheat planted under dryland conditions has been declining for several seasons (Box 5.1), but is projected to stabilize around 65 thousand hectares over the next decade. Soil moisture levels and relative profitability to summer grain crops will determine the extent to which producers increase plantings above the current projected levels. The wheat area under irrigation is set to remain relatively stable with most of the hectares being planted in a double cropping system. However, the Northern irrigation areas will face more stiff competition from barley due to the expansion in malting facilities in Alrode.

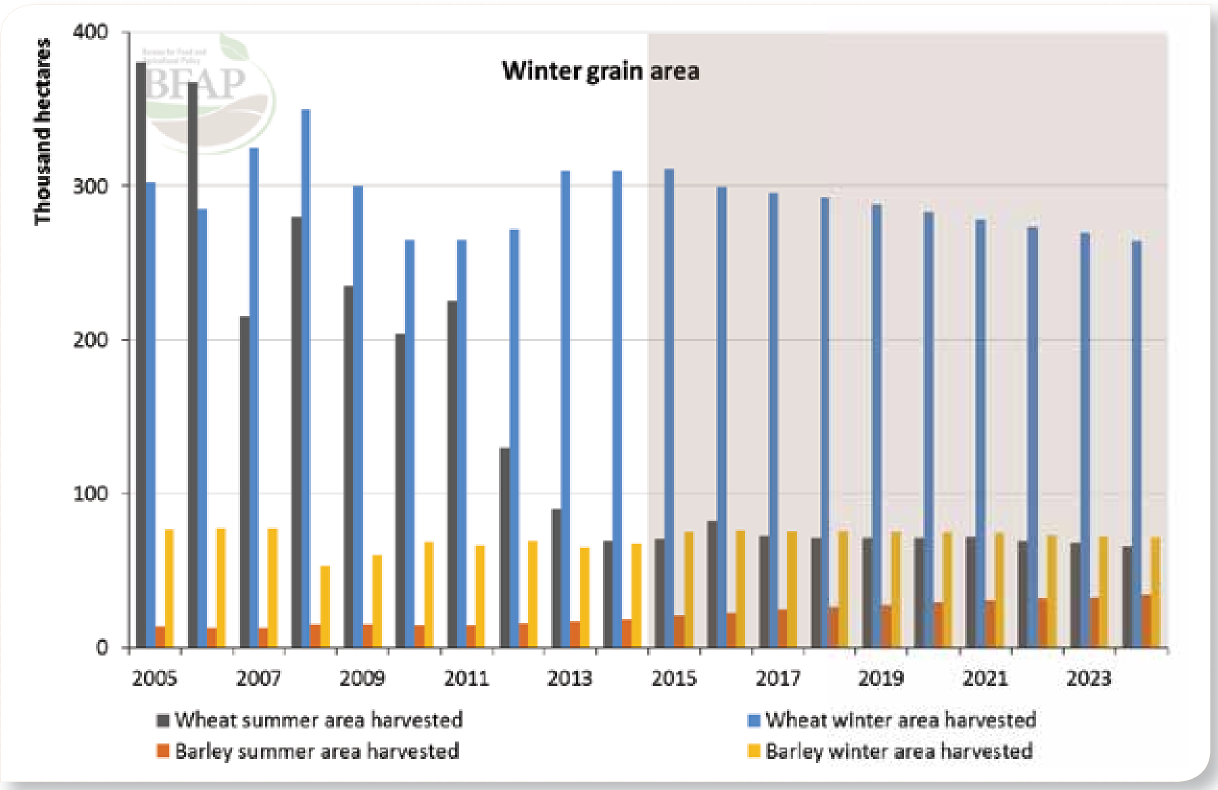


Figure 5.2: *Winter grain area harvested*

Despite a decline in international wheat prices, the average SAFEX wheat price is projected to rise above R3800 per ton in 2015, an increase of almost 6% from 2014 levels (Figure 5.3). The projected increase is attributed to a combination of the variable import tariff and a weakening of the exchange rate against the Dollar. Any world price movement below $294/ton does not really affect the domestic market and in June 2015, the variable import tariff amounted to R800/ton. Marginally increased area, combined with improved yield levels support a small production increase in 2016. Over the long run, domestic production is projected to remain relatively stable around 1.6 million tons with the projected yield growth sufficient to offset the declining area. In the face of rising consumption levels, imports will continue to increase, surpassing 2.2 million tons by the end of the baseline period (Figure 5.3). Over the course of the outlook, imports will exceed domestic production and in the long run, South African wheat prices will remain strongly influenced by international prices and the exchange rate.

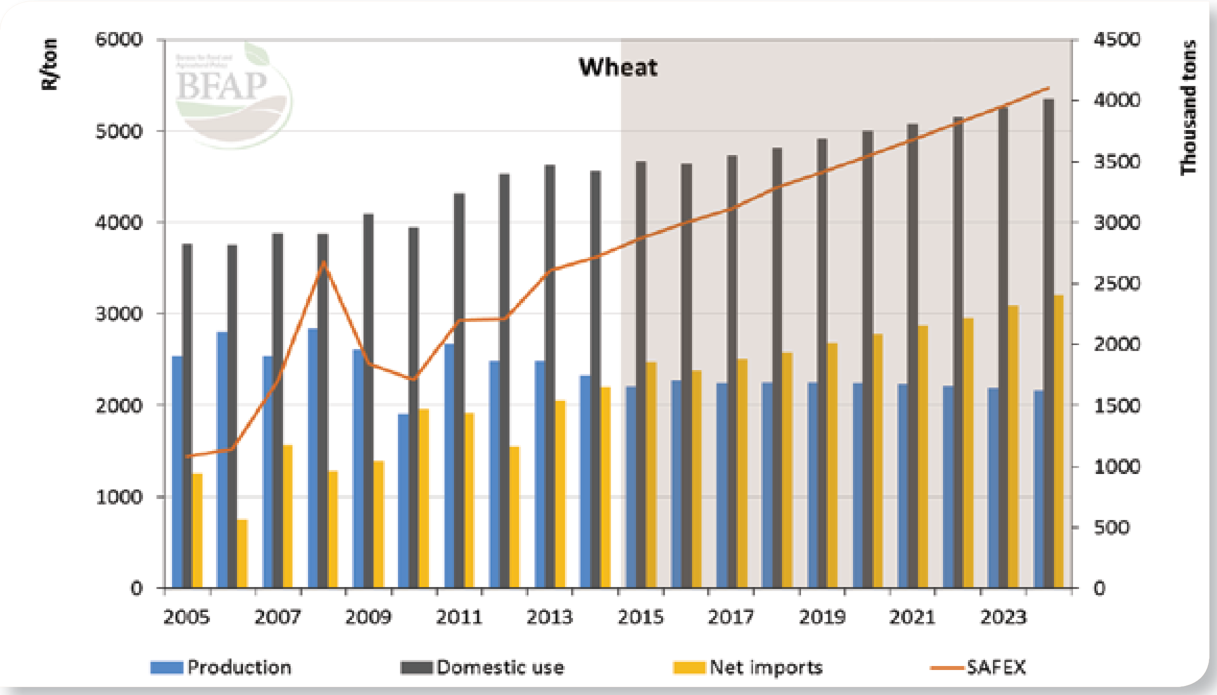


Figure 5.3: *Wheat production, consumption, trade and price*

Box 5.1: Assessing the drivers of wheat production trends in South Africa

South Africa's total wheat area reached a maximum of close to 2 million hectares in 1988 with dryland wheat in the Free State province covering more than half of the national wheat area. The first major drop in wheat hectares occurred in 1992,

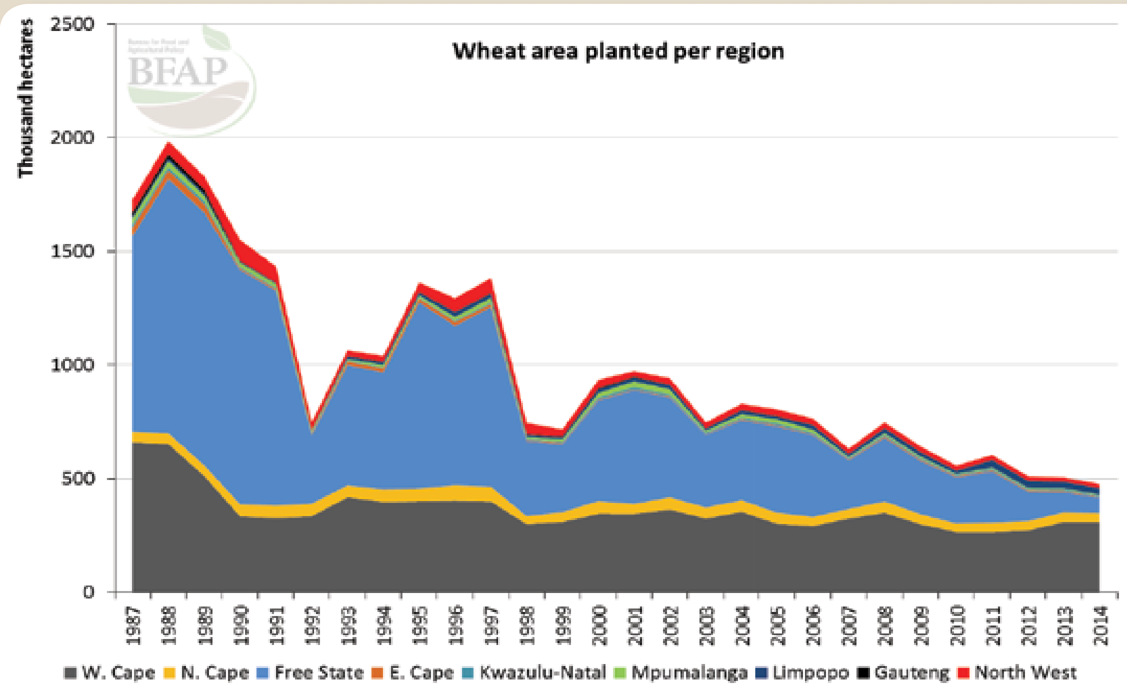


Figure 5.4: *Provincial wheat area trends*

Source: Grain SA

following a program by the South African government incentivising farmers to convert wheat fields to grazing pasture and natural grazing. This decline in hectares was further exacerbated by the severe drought. While the wheat area in the other main production region, the Western Cape, also reflected some decline, it was not nearly as dramatic and over the past decade this area has remained relatively stable around 300 thousand hectares. The trend of declining area in the Free State persisted however, resulting in merely 70 thousand hectares of wheat (irrigation and dryland) being planted in the Free State in 2014 compared to more than 1 million hectares in 1988.

Wheat farmers in the Free State have been faced with a changing production environment over the past two or even three decades. This changing environment has influenced farmers' willingness and ability to plant wheat and likely will also effect farmers' capability to react to future wheat market signals. Figure 5.5 presents a spatial comparison of the Free State dryland wheat area for 2007 and 2014. In 2007 more than 180 thousand hectares of dryland wheat was being planted in the North-western, Southern and Eastern Free State (wheat plantings indicated in green on the map). In 2013, the area declined to 57 thousand hectares and in 2014 even less, with only the Eastern Free State still planting a significant area to dryland wheat (purple on the map). The Free State irrigation wheat area remained relatively stable around 33 to 34 thousand hectares during this same period, but it is evident that North-western and Southern Free State farmers have to a large extent stopped producing dryland wheat.

In the North-western and Southern Free State, winter dryland wheat has largely been replaced with summer maize and sunflower while the North-western region has also seen a substantial increase in soya bean plantings. In 2014, the remaining

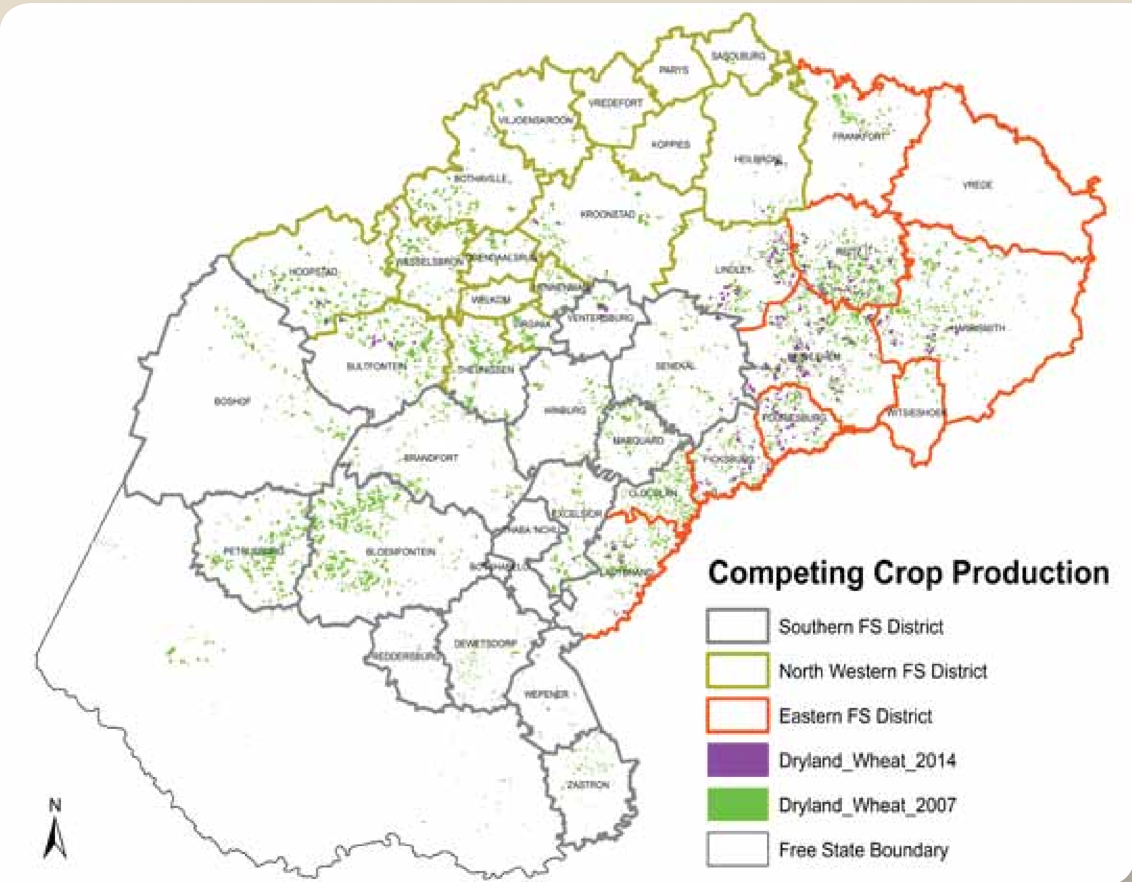


Figure 5.5: *Change in area planted to wheat in the Free State*
Source: DAFF, 2014

Free State dryland wheat was planted in the Eastern Free State but a substantial share of former wheat land was 'lost,' particularly to soya beans produced in rotation with maize.

Figure 5.6 compares dryland wheat yields for the North-western, Eastern and Southern Free State. While the North-western and Eastern regions' yields are closely correlated and similar, the Southern region's wheat yields are much lower and contrary to the two other areas, actually follows a decreasing trend. The North-western and Eastern Free State's increasing trend can partly be attributed to more marginal wheat land going out of production.

A major driver of the decreasing trend in yields in the Southern Free State is the fact that this region is receiving less rain during September and October, which represent crucial months for winter dryland wheat production. In addition to considerable fluctuations between seasons, it is apparent that rainfall in the Southern Free State reflects a decreasing trend for both September and October (Figure 5.7). Furthermore, this declining trend in rainfall already starts at a rather low level. While the September rainfall for the Eastern Free State also shows a declining trend, October rainfall actually seems to be increasing somewhat.

Given the baseline presented in this document, yield expectations based on an improving-technology assumption, as well as data collected from wheat producers in the Eastern Free State under the BFAP agri benchmark initiative, Figure 5.8 graphically illustrates historic and expected gross margins for wheat, maize and soya beans. The linear trend lines for the three commodities indicate that the gross margins (proxy for crop profitability) for maize and soy beans have increased at a stronger rate than wheat, mainly driven by improved seed varieties for maize and the introduction of soya beans as part of a rotational system with maize.

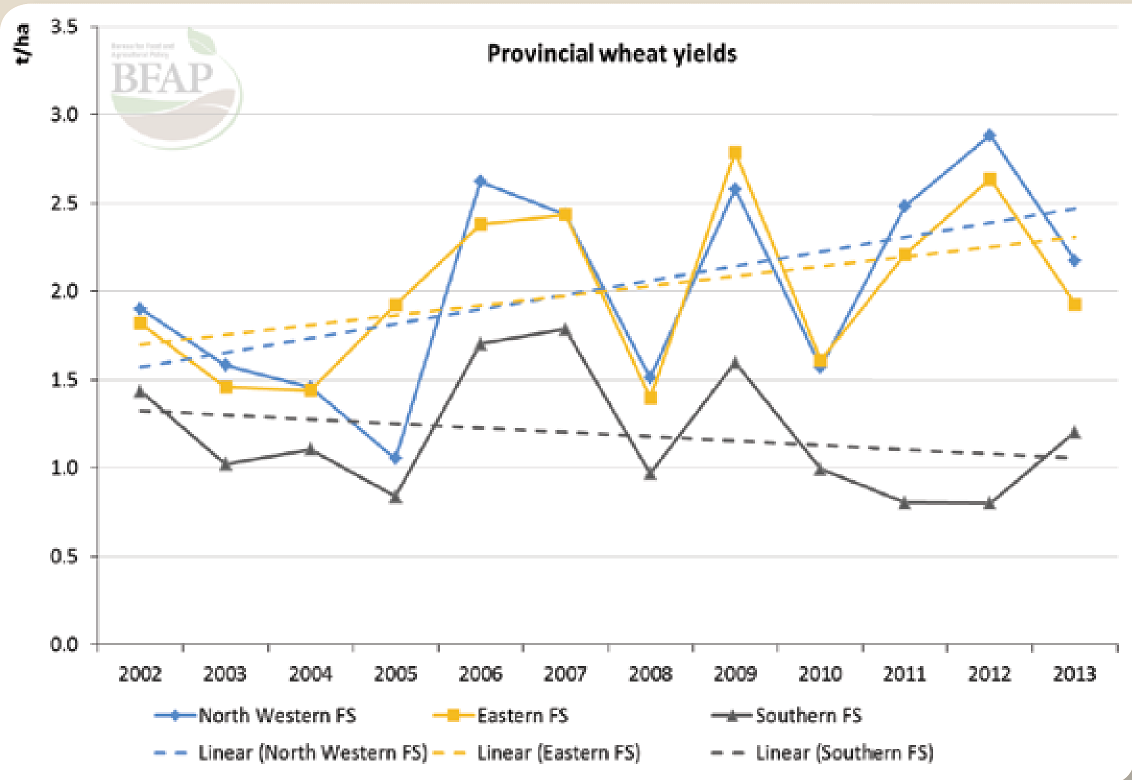
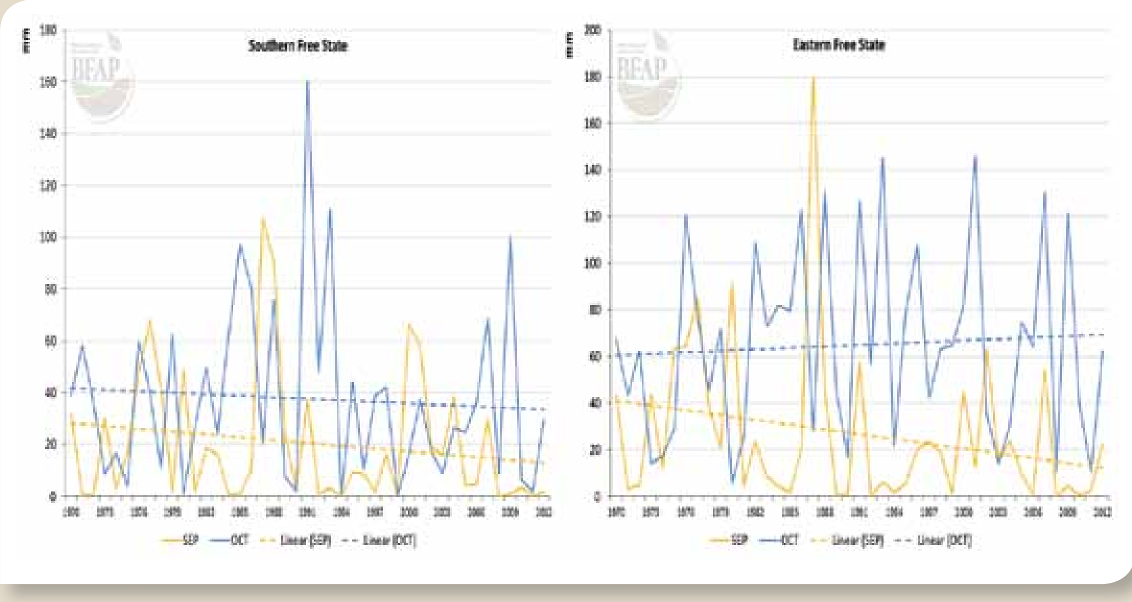


Figure 5.6: *Wheat yield comparison for North-western, Eastern and Southern Free State*
Source: VKB (2015)



Figures 5.7: *September and October rainfall trends comparison for regions of the Southern Free State and the Eastern Free State*
Source: SA Weather

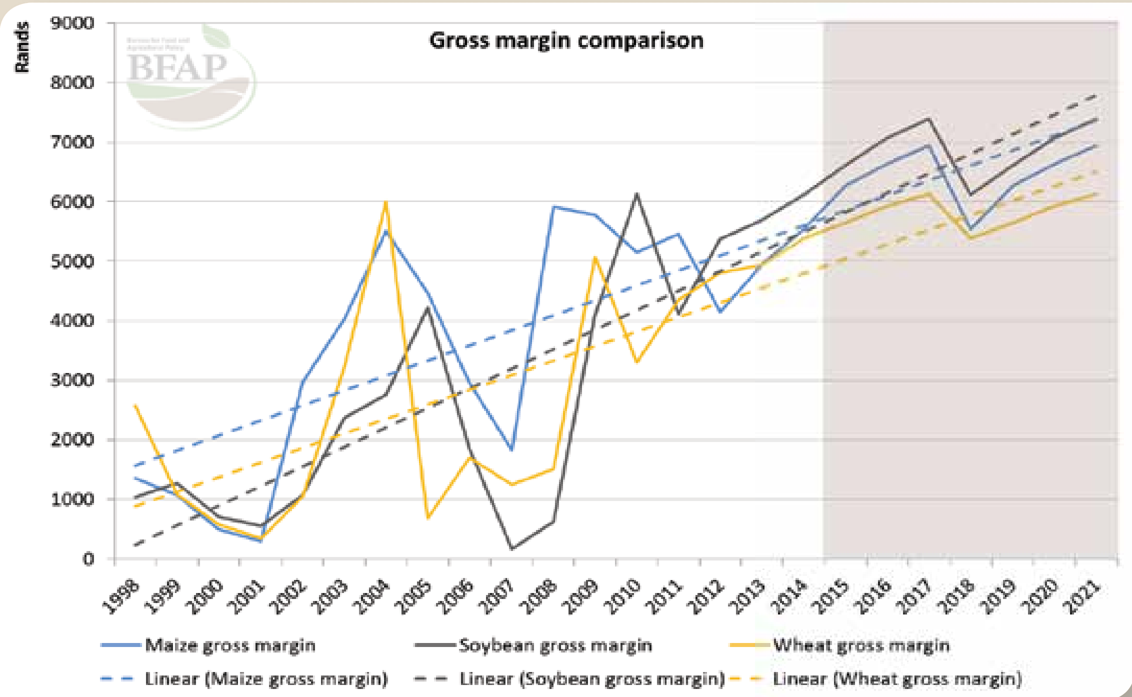


Figure 5.8: *Historic and projected gross margin comparison for Eastern Free State maize, soya beans and wheat*

Within higher rainfall regions, where producers obtain exceptional yields, returns from dryland wheat are still reasonable and comparable to competing crops. However for farmers in the Southern Free State, where rainfall during crucial winter crop periods are dwindling, summer crops may make more sense.

Domestic barley situation and trends

Should normal weather conditions prevail, barley production is projected to expand by 10 thousand hectares in 2015 compared to 2014 levels. Despite of the expected rise in production levels, the rapid increase in the demand from the expansion in local malting capacity, implies a marginal increase in malting barley imports in 2015 (Figure 5.9). Over the next decade however, the combination of area expansion, mainly in the inland irrigation area and continuously improving yields result in output expanding at a slightly faster rate than consumption and consequently the imports required to supplement domestic production declines. Should the quality of the domestic barley match the specific requirements of beer producing companies, imports will decline and local supply and demand could be in balance by 2018 (Figure 5.9)

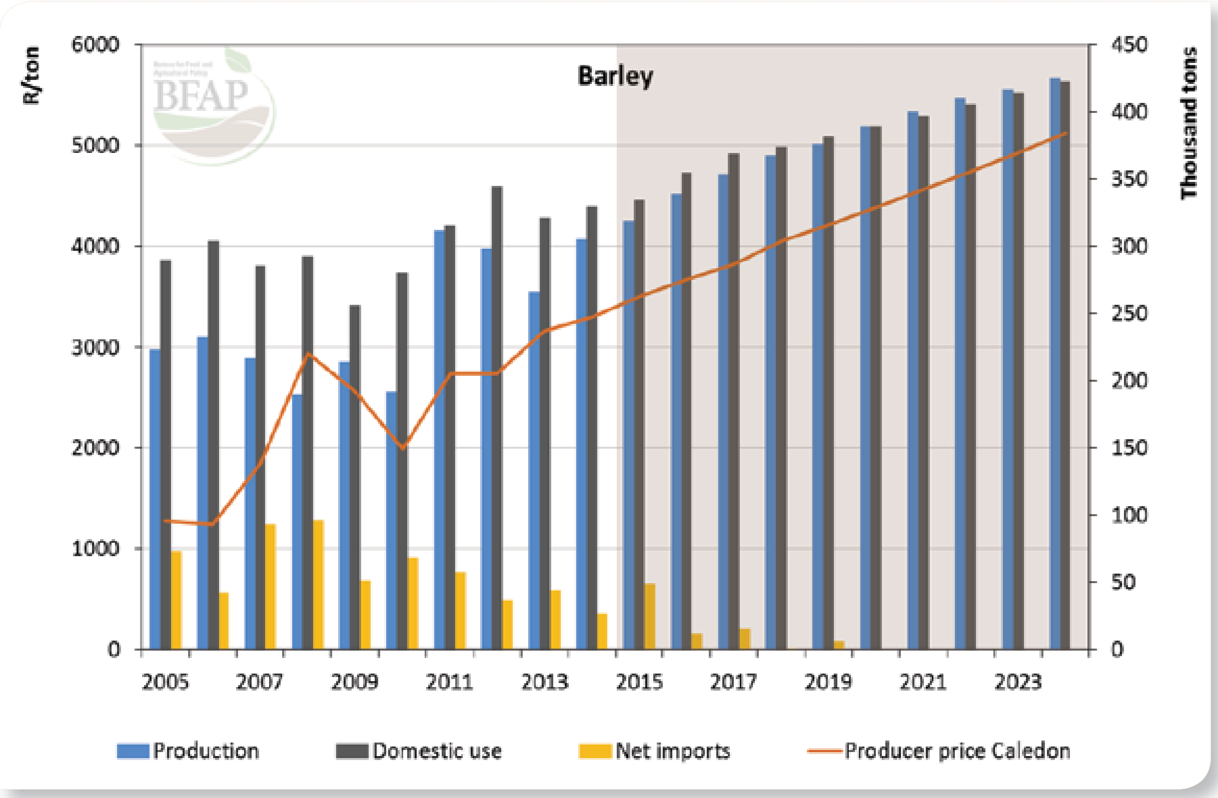


Figure 5.9: *Barley production, consumption, trade and producer price*

South African Outlook

OILSEED AND OILSEED PRODUCTS

Ample supplies, combined with stagnant demand for vegetable oil in the biodiesel market placed international oilseed prices under pressure during 2015. Domestically, soya bean area continues to expand and despite the drought, South African production is expected to exceed 1 million tons in 2015.

Global oilseed situation and trends

Global oilseed production during the 2014/15 marketing year exceeded previous records for the second consecutive season, following larger than expected soya bean crops in South America. Ample supplies, combined with stagnant demand for vegetable oil in the biodiesel market placed international oilseed prices under pressure during 2015 (Figure 6.1). Vegetable oil prices have been on a declining trend for the past 5 years and with the sharp decline in crude oil prices over the latter half of 2014, have found little support on the demand side. In contrast, firm demand for animal feed has supported protein meal prices and given its favourable input cost structure relative to other summer crops, soya beans have continued to expand its share of the global oilseed complex.

Global soya bean production is expected to exceed consumption for the fourth consecutive year in 2015/16, resulting in a further accumulation of stock levels. In contrast, the outlook for high oil yielding crops such as sunflower and canola is more reserved as area has consolidated and some weather concerns are emanating from key production regions in Canada and the European Union. Consequently, the share of oil in the value of oilseeds is expected to recover somewhat and soya bean prices are projected to fall below that of sunflower and canola once more, returning to historic relationships. Over the medium term, growth in total oilseed production is projected to slow and given the projected expansion in livestock production, as well as the fact that much of the price elastic portion of biodiesel use has already been lost, prices should find some support from 2017 onwards, before stabilising in the outlying years of the baseline projection.

Domestic oilseed situation and trends

The area under sunflower cultivation declined slightly to 576 thousand hectares in 2015 from almost 600 thousand hectares planted in 2014 (Figure 6.2). A further reduction of 60 thousand hectares in the local sunflower area is projected for 2016 due in large to the disappointing yields obtained in 2015. Higher projected prices in 2015 are insufficient to offset drought induced yield reductions and consequently the average gross income from sunflower production will decline from 2014 levels. Sunflower plantings are projected to decline gradually over the next three to four years and then stabilize around 460 thousand hectares as the expected growth in the sunflower yields will be sufficient to keep the local market in fine balance.

South African soya bean producers expanded area to a record 687 thousand hectares in 2015, 37% above 2014 levels (Figure 6.2). Unfortunately, yields are expected to decline by 22% to 1.47 tons per hectare following the drought, resulting in only

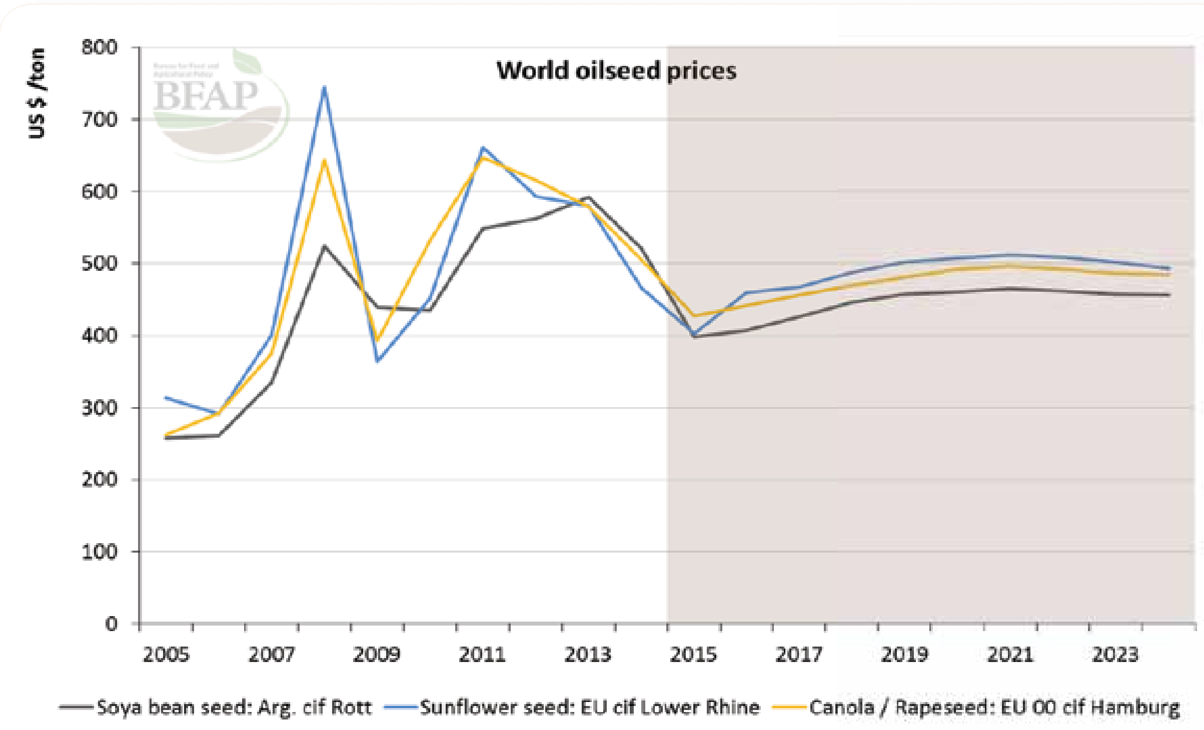


Figure 6.1: *World Oilseed Prices*
Source: FAPRI & International Grains Council

a small increase in local soya bean production. Domestic soya bean area is projected to sustain its increasing trend over the baseline period, as summer grain producers progressively incorporate more soya bean production as part of their crop rotation practices. By 2024 the area under soya bean cultivation is expected to surpass 1 million hectares (Figure 6.2).

The area under canola has also reflected a strong increasing trend over the past four seasons and ultimately reached a record 95 thousand hectares in 2014. Reduced profitability from lower prices and disappointing yields in 2014 is projected to induce a reduction of approximately 10 thousand hectares in 2015 (Figure 6.2). In the long run, canola plantings are projected to continue on an expanding path, as growth in yields and consequently profitability render canola cultivation more attractive as part of a crop rotation program in the winter rainfall area.

Domestic soya bean production has grown tremendously over the past decade, achieving an average growth rate of 13% per annum from 2005 to 2014. In 2012, soya bean area surpassed sunflower seed for the first time and it has become the most important oilseed crop produced in South Africa. Soya bean production is expected to continue its expansion over the baseline period at a lower rate of between 8% and 9% per annum, driven by further area expansion and improved yields. The lower projected growth rate is partly attributed to the significantly higher base and in absolute terms production is projected to expand by an average of more than 100 thousand tons per year (Figure 6.3).

Despite the drought conditions in 2015, South Africa is expected to harvest a record soya bean crop in excess of 1 million tons. In light of the projected area expansion in 2016, a return to trend yields would result in a crop of more than 1.2 million tons. By 2024, production is projected to surpass 2.1 million tons.

The local oilseed crushing industry has rapidly expanded capacity over the past few seasons. However with many new crushing plants coming online, utilization rates have remained low due to technical challenges in a number of newly constructed plants, as well as a shortage of domestically produced soya beans. While some soya bean imports have been forthcoming over the past two seasons, domestic soya bean prices remain well below import parity levels, as they are derived from the price of oil and oilcake. Hence crushing margins come under immense pressure when the cost of beans increases to import parity levels. However, over the course of the next decade, utilisation rates are projected to improve and with domestic soya bean production still expanding, only a limited amount of soya beans will occasionally be imported (Figure 6.3).

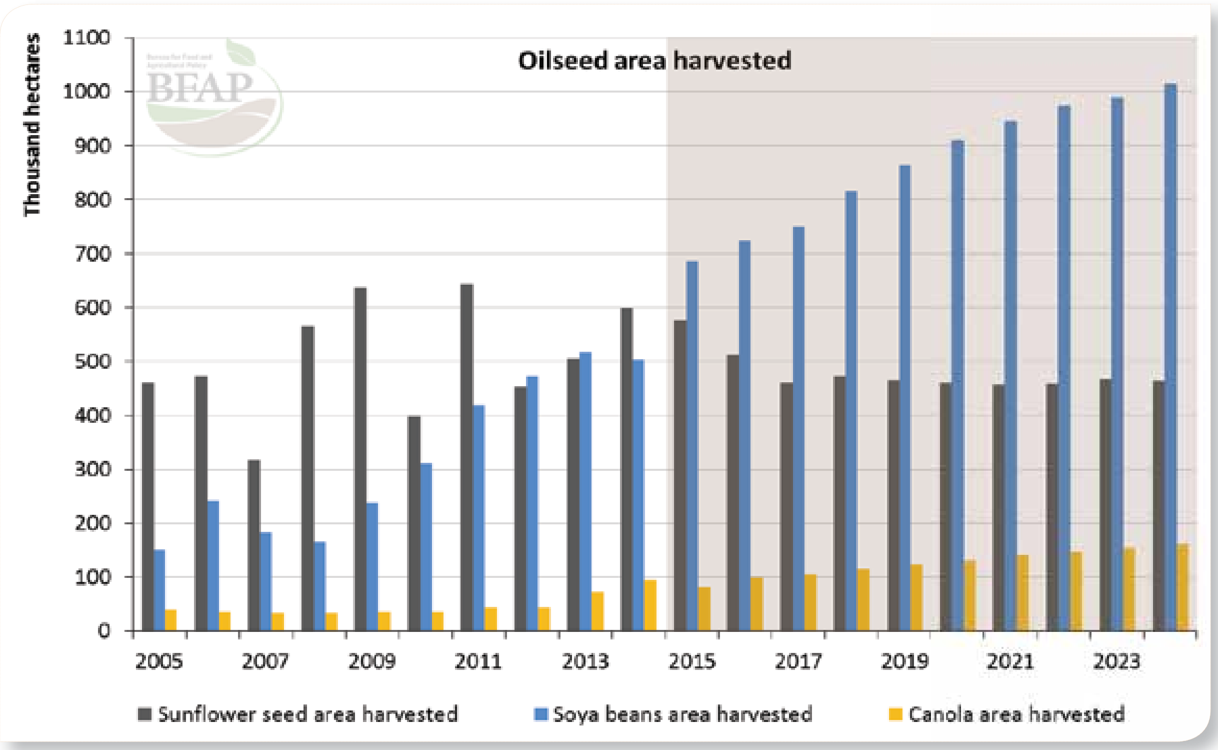


Figure 6.2: *Oilseed area harvested*

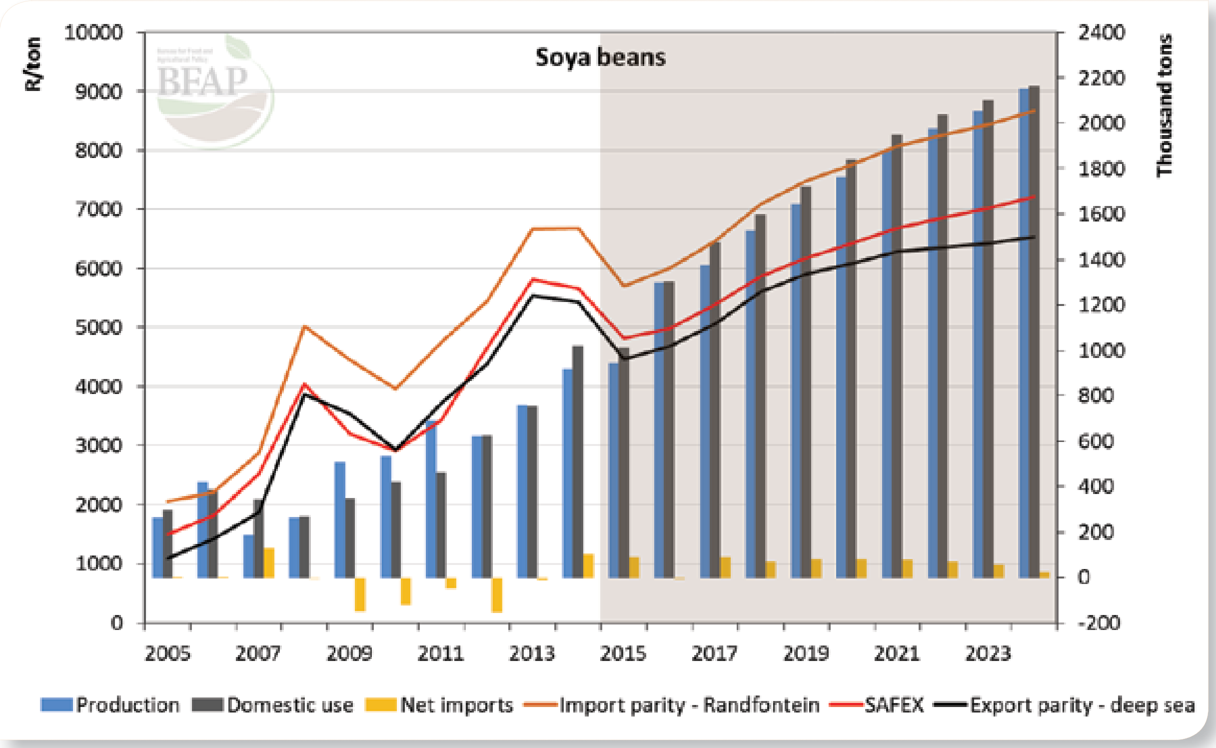


Figure 6.3: *Soya bean production, domestic use, net trade and prices*

Following the recent expansions, the total crushing capacity derived from dedicated soya bean crushers in South Africa is estimated at 1.75 million tons. Considering the additional plants that are able to switch between soya beans and sunflower crushing, this capacity could be expanded to just over 2.5 million tons if all plants with dual capacity were to crush soya beans only. This capacity remains theoretical however, as international comparisons indicate that over the long term, crushing capacity utilisation tends to remain below 85%, with 80% being accepted as a benchmark for modern crushing facilities. Figure 6.4, therefore illustrates that, at this benchmark utilisation rate of 80%, some of the dual crushing capacity would need to move into soya bean crushing after 2017 in order to crush the quantities projected under the baseline assumptions. By 2024, all of the dual capacity would have to be utilised for soya bean crushing if the projected volumes are to be crushed without further expansion of capacity.

As a consequence of the drought, the production of sunflower seed decreased by 26% to an estimated level of 612 thousand tons 2015. In response to the smaller domestic crop, imports will likely increase, supplementing domestic production and causing prices to rise to import parity levels occasionally. Over the bulk of the marketing year, prices are still expected to remain within the parity band, being derived from the price for oil and cake. Despite the decline in international oilseed prices, the relative weakness of the Rand will support domestic prices (Figure 6.5).

The increase in domestic sunflower prices in 2015 will be insufficient to compensate for lower yields and income per hectare will decline from 2014 levels. Accordingly, producers are projected to decrease sunflower plantings to around 511 thousand hectares in 2016 and if normal yields are achieved, production will increase to 740 thousand tons. For the remainder of the baseline period, the growth in yields is projected to offset the reduction in area planted and production will continue to expand gradually towards 2024. Yields are expected to grow faster over the outlook period due to the adoption of new technology, like Clearfield hybrids as well as intensification of production practices. The fine balance in the local sunflower market will be maintained and given ample domestic crushing capacity, South Africa is projected to maintain a small net importing position with regard to sunflower seeds over the baseline period (Figure 6.5).

Canola is not traded on SAFEX and currently has only one main buyer (Southern Oil (Pty) Ltd (SOILL)) for the majority of the crop. Therefore the determination of the canola mill door

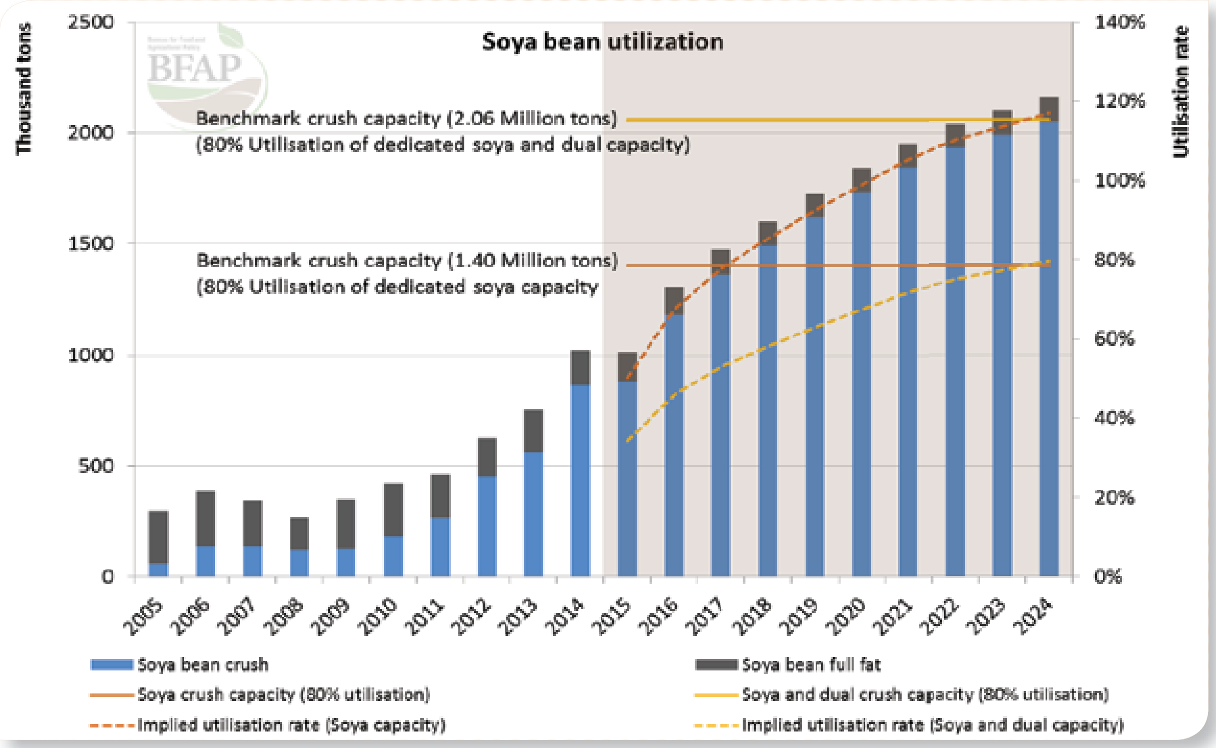


Figure 6.4: Soya bean utilisation and crushing capacity in South Africa.

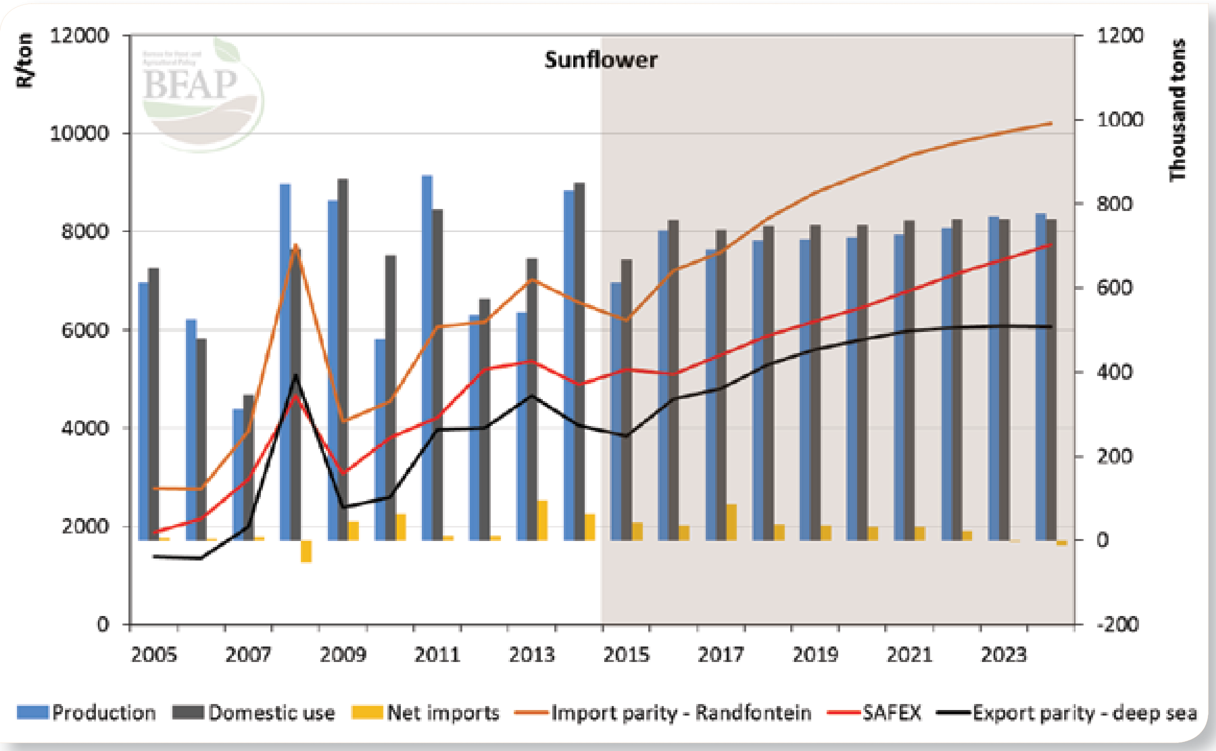


Figure 6.5: Sunflower seed production, domestic use, trade and prices

and producer price is rather complex. The canola price in the model is derived from the domestic sunflower and soya bean oil and oilcake prices as well as the canola oil import parity price. Subtraction of canola crushing costs, an area differential of R205 per ton and handling costs from the producer price yields a mill door price of just over R5000 per ton for 2015. Storage and financing costs remain unaccounted for in the calculation. Both producers and the off-taker will benefit from a pricing mechanism that is linked to a futures market, such as the barley pricing mechanism that links the barley price to the wheat futures price.

As the most comparable price to sunflower and soya bean prices quoted on SAFEX, baseline projections are based on the mill door price equivalent. The real canola mill door price is projected to decrease over the outlook period, similar to both the real soya bean and sunflower seed prices. Producers in the Southern Cape have widely adopted a crop rotation system that includes canola, wheat and / or barley as well as feed crops such as lucerne. This rotation has proven to be very efficient and has driven increases in canola production, mainly in the Southern Cape. Further expansion in Canola hectares in this region is partly limited by a rotation system and the largest share of the projected expansion will have to come from the Swartland region, which has not produced canola as widely as the Southern Cape farmers yet. SOILL, the only canola crushing plant in South Africa at present, is expanding its processing capacity, adding further incentive for canola expansion. Over the outlook, the area under canola is projected to increase to around 160 thousand hectares, a 70% increase on the current 95 thousand hectares planted in 2014. Under the assumption of normal weather conditions and continuous yield growth resulting from continuous technological improvement, canola production will surpass 270 thousand tons in 2024 (Figure 6.6).

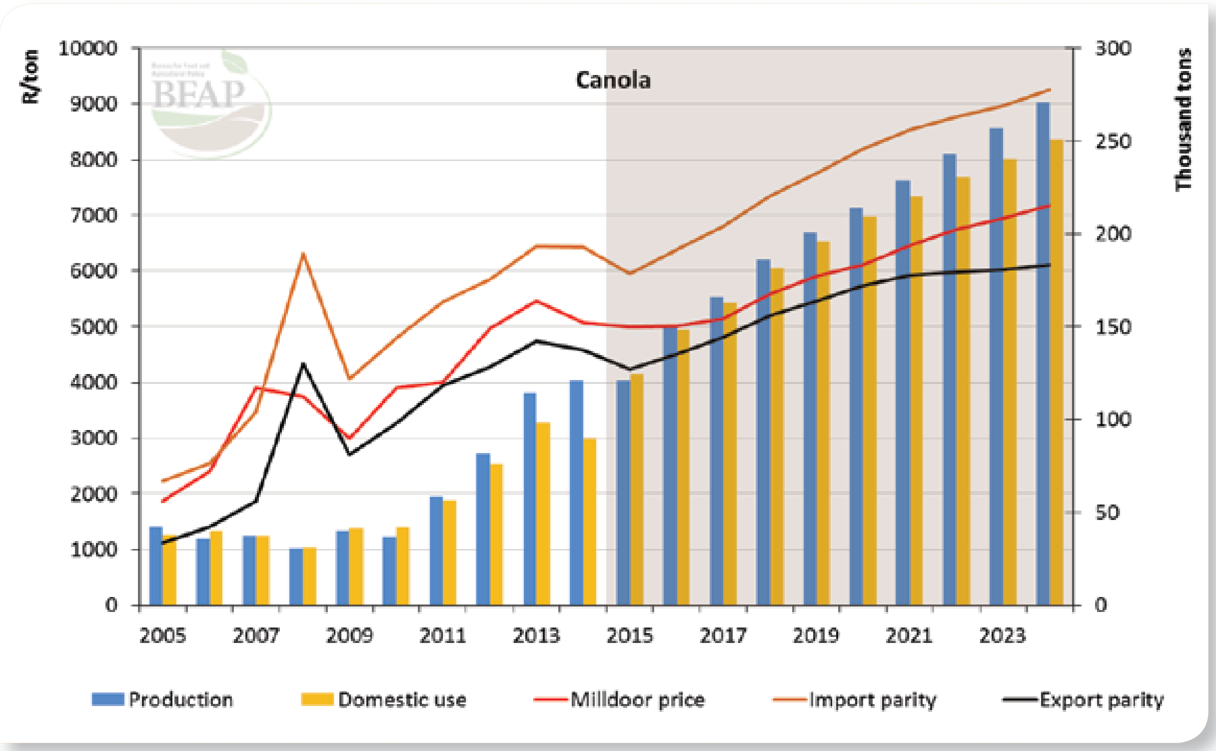


Figure 6.6: *Canola production, domestic use and prices*

Global oilcake situation and trends

The share of soya beans in the global oilseed market has expanded continuously for several seasons. As the only oilseed produced for its protein meal yield, it remains the benchmark for international oilcake prices. Production growth has been driven by firm demand for animal feed, which has increased the protein meal value share of oilseeds and further fuelled the expansion of soya bean share. Globally, the use of protein meals continues to expand, however the rate of growth has slowed substantially from the previous decade, pointing to an extent of saturation within current markets.

The reduced rate of demand growth, coupled with ample supplies has seen significant stock accumulation in the oilcake market and consequently prices are expected to continue sliding in the short term, bottoming out below $400 per ton. Reduced prices are projected to create some demand stimulus and as production consolidates, prices will find some support from 2017 onwards (Figure 6.7).

Domestic oilcake situation and trends

In 2015, just over 800 thousand tons of soya bean oilcake will be produced locally, which constitutes 63% of the projected consumption of just over 1.2 million tons. The balance of demand will be imported. The share of imports in total soya oilcake consumption has been declining since 2011 and 2015 marks the second successive year that more than half of the consumed soya bean oil cake will be produced locally. By 2024, domestic soya oilcake production is projected to exceed 1.6 million tons, which represents 87% of the total projected soya bean oilcake consumption of 1.8 million tons.

Despite the growth in domestic production, an expansion of 35% in domestic demand over the next decade implies that South Africa will remain a net importer of soya oilcake. The price trends will therefore remain largely dependent on international prices and exchange rate fluctuations, until sufficient oilcake is produced locally to break away from import parity levels (Figure 6.8). Nonetheless, industry indications are that domestically produced soya oilcake is currently trading at a discount to imported oilcake, due in large to technical challenges and resulting fluctuations in the protein content of domestically produced meal. Over the course of the next few years, expectations are that, with a more consistent supply of

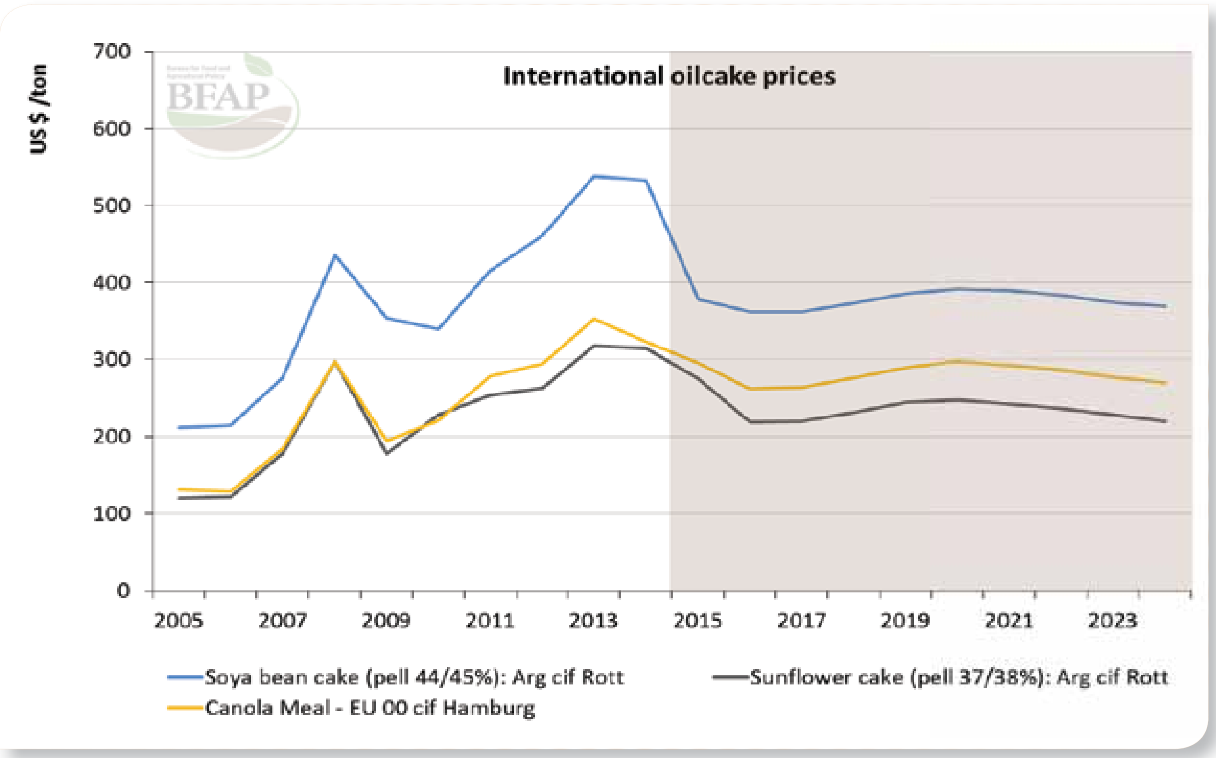


Figure 6.7: *Soya bean, sunflower and canola oilcake world prices*

Source: FAPRI & International Grains Council

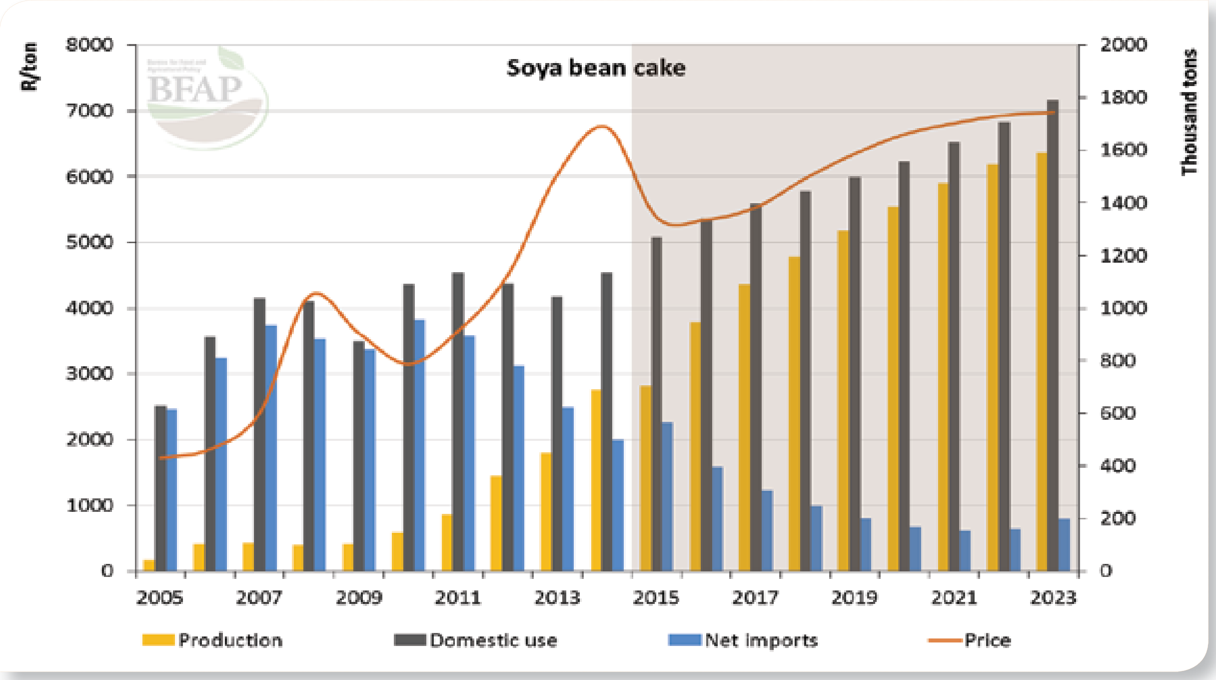


Figure 6.8: *Soya bean oilcake production, consumption, trade and prices*

soya beans and the resultant regularity of crushing, the protein content in domestically produced meal should become more consistent, allowing the current discount to decline.

Sunflower oilcake consumption is projected to increase from 417 thousand tons in 2015 to 433 thousand tons by 2024. In line with sunflower seed production, the production of sunflower oilcake is also projected to remain largely constant over the baseline and increases in consumption will mostly be supplied by imports. Imports are projected to rise to 100 thousand tons by 2024. However, the availability of locally produced sunflower oilcake and its price relative to soya bean and cotton oilcake will influence the quantities imported (Figure 6.9).

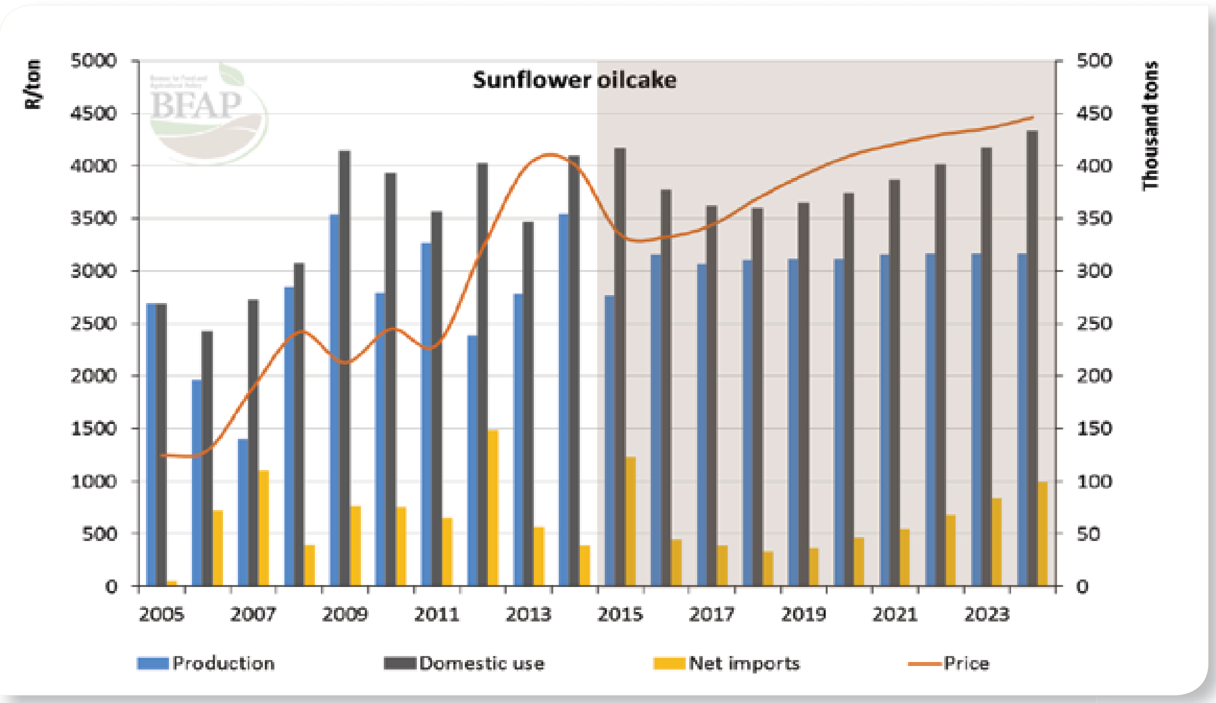


Figure 6.9: *Sunflower oilcake production, consumption, trade and prices*

On average canola oilcake has a protein content of around 34%, comparable to sunflower oilcake (38%), while soya bean oilcake has the highest protein content of up to 48%. In line with global norms, soya bean oilcake represents the protein of choice for intensive livestock producers due to its favourable quality characteristics. Sunflower and canola on the other hand are produced primarily for their higher oil yield. Nonetheless, canola oilcake has been used successfully in the dairy industry and presently the bulk of canola oilcake is consumed on dairy farms in the region. The projected increase in canola production and crushing will lead to a doubling of the current local production by 2024, which could dampen the future price of canola oilcake, as the high fibre content and lower level of bypass protein, which is important in ruminant feeds, constrain the utilisation of canola oilcake. Competitive replacement of other meals such as soya oilcake is only projected at very low prices.

Global vegetable oil situation and trends

South Africa remains a net importer of vegetable oils and therefore local prices are mainly determined by international prices and exchange rates. International growth in vegetable oil production and exports is dominated by Malaysia and Indonesia; the leading countries in palm and palm kernel oil production. While soya beans has driven oilseed production increases in recent years, it has a lower oil content and a large share of global vegetable oil production originates from palm, palm kernel, coconut and cotton seed. Due to the size of palm oil's share of the total global vegetable oil market and because of its relative price competitiveness, the international palm oil supply and demand situation strongly influences other vegetable oils as well.

International vegetable oil prices have been declining since 2011, however the area planted to typically high oil yielding oilseeds such as canola and sunflower seed has consolidated. Combined with concerns related to the potential impact of El Nino on rainfall in South East Asia, and consequently palm oil production, this results in the expectation that prices will consolidate and the share of vegetable oil in total oilseed value will recover somewhat. Global canola oil production has declined for the second consecutive season and with the price elastic share of vegetable oil for biodiesel demand already erased, canola and sunflower oil are expected to regain their premium above soya bean oil (Figure 6.11).

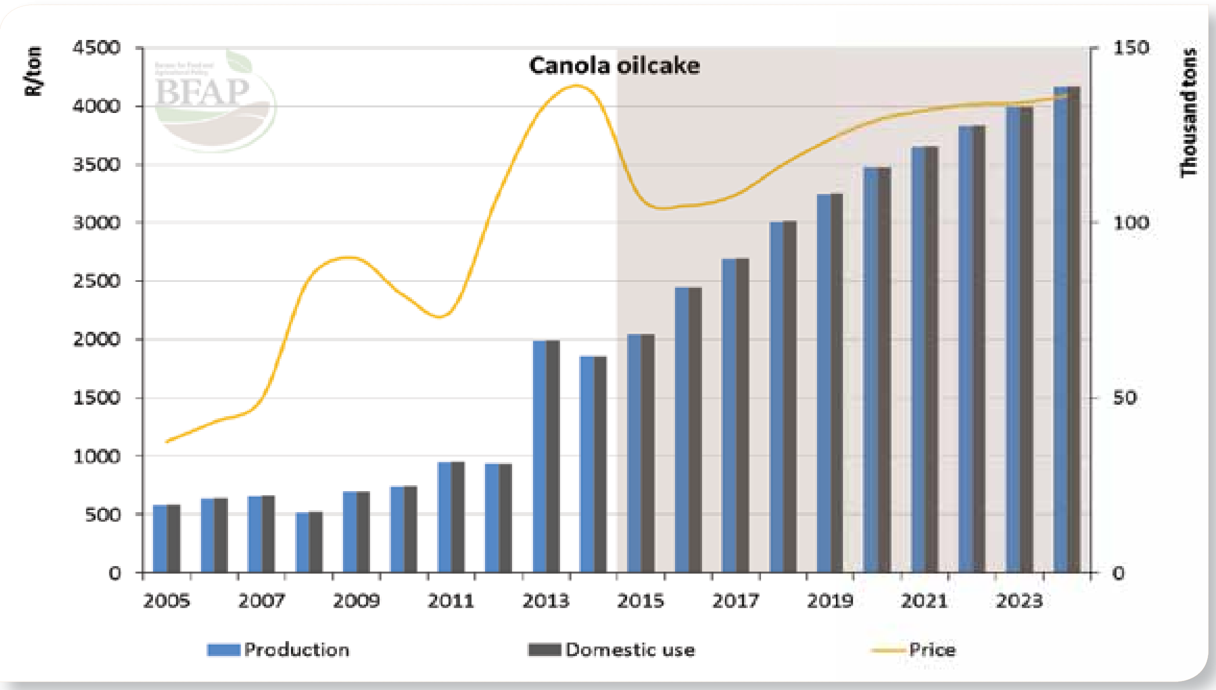


Figure 6.10: *Canola oilcake production, consumption, trade and prices*

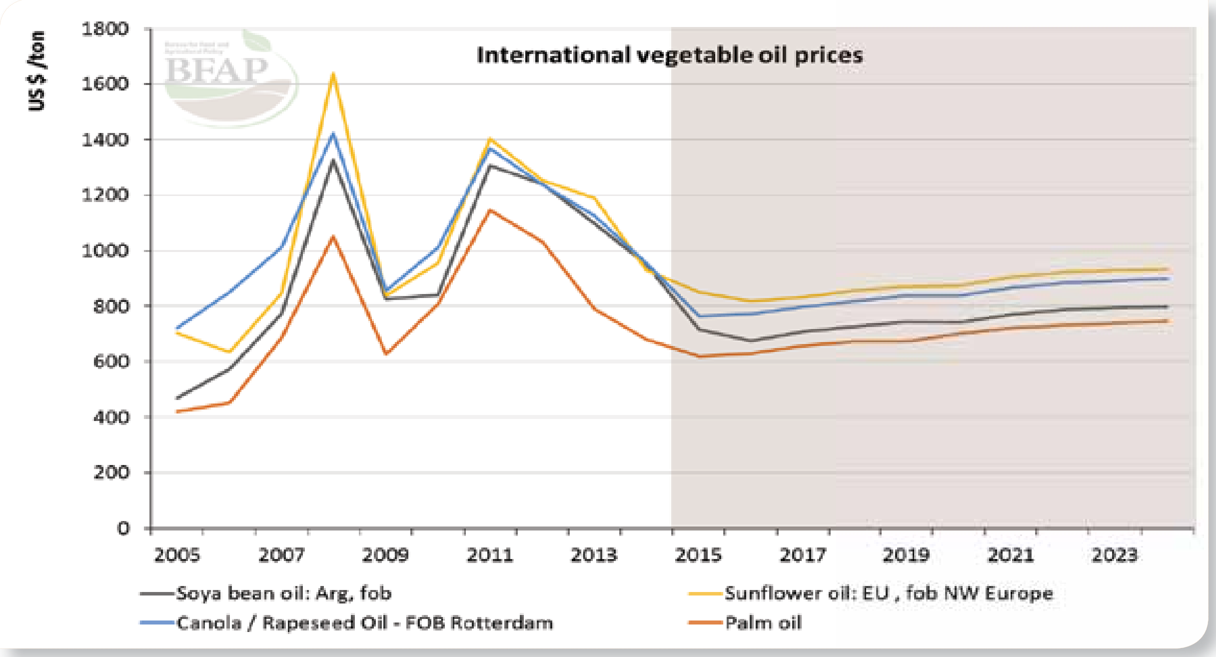


Figure 6.11: *Vegetable oil world prices*

Source: FAPRI & International Grains Council

Domestic vegetable oil situation and trends

The sharp decline in global vegetable oil prices resulted in domestic vegetable oil prices in South Africa also trading softer in 2015. The magnitude of the decline in domestic price levels is however well below international levels, as the depreciation in the exchange rate provided some support to domestic price levels. Over the next decade, local vegetable oil prices will continue to be driven by international prices and fluctuations in the Rand/Dollar exchange rate (Figure 6.12).

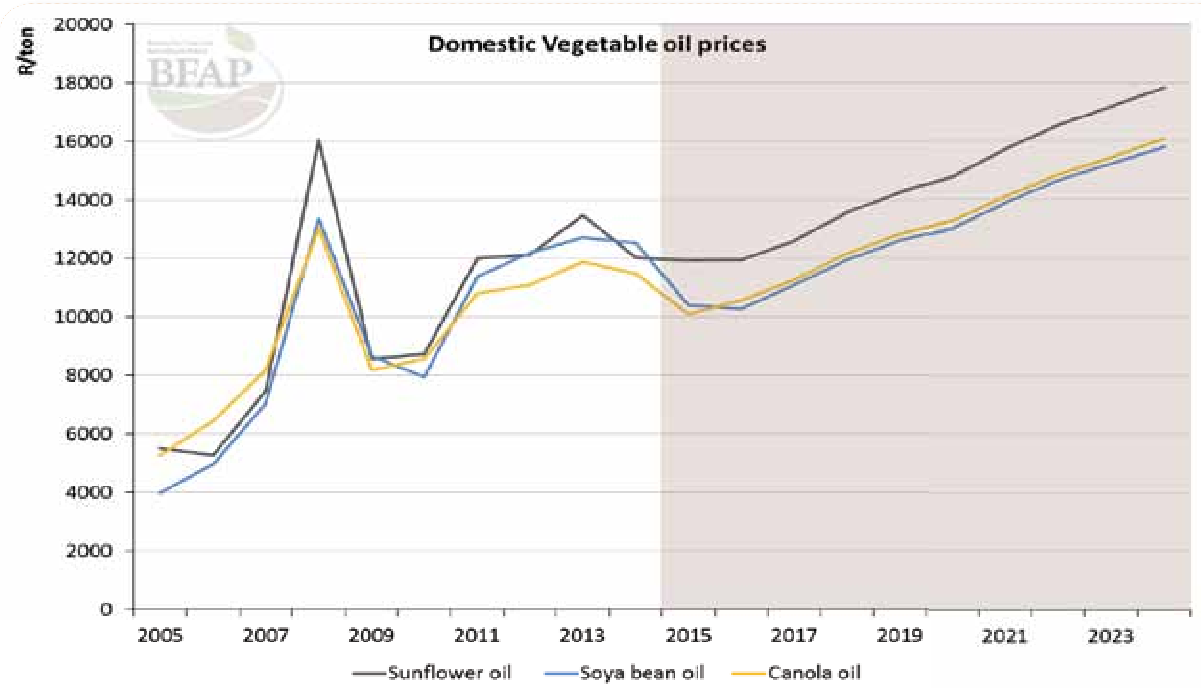


Figure 6.12: *Domestic vegetable oil prices*

The combined domestic consumption of palm, sunflower, soya bean and canola oil during 2014 is estimated as 1.23 million tons. Palm oil, which is mainly used together with other vegetable oils as frying oil by the restaurant and food catering industry, comprises about 36% of total consumption and approximately 50% of vegetable oil imports. Sunflower and soya bean oil are consumed as frying oil, household cooking oil and in the manufacturing of salad dressings, margarine and mayonnaise.

In supermarkets, canola oil is currently marketed as a niche product, mainly due to the small volume produced domestically, as well as its favourable qualities as household cooking oil, since it has the lowest saturated fat content of all vegetable oils. Apart from its consumption as oil and oil blends (such as the canola-olive oil blend), canola is also processed into margarine and mayonnaise. Domestic consumption of canola oil is projected to double over the baseline period, reaching almost 90 thousand tons by 2024 (Figure 6.13).

Local production of vegetable oils is largely dependent on the local production of oilseeds. In general, when the local production of oilseeds decreases significantly in a particular season due to a factor like droughts or lower plantings, it is more cost competitive to import crude vegetable oil than to crush imported oilseeds, hence the substantial fluctuations in the domestic production of vegetable oil. Currently sunflower oil comprises the largest share in locally produced vegetable oils but its share will decrease over the baseline period as local production of sunflower seed is projected to remain relatively flat while that of soya beans and canola will increase (Figure 6.14).

South Africa relies on imports to provide its palm oil demand, as palm oil is not locally produced. The imports of sunflower, soya bean and canola oil depends on the magnitude of the shortfall in the domestic market, which is strongly influenced by the local availability of oilseeds. Sunflower oil imports are projected to increase from 125 thousand tons in 2014 to 182 thousand by the end of the baseline period. Soya bean oil imports are projected to decline from 170 thousand tons to 10 thousand tons because of the projected increase in local soya bean production and crushing. Canola oil imports remain on a relatively small level compared to the other vegetable oils (Figure 6.15)

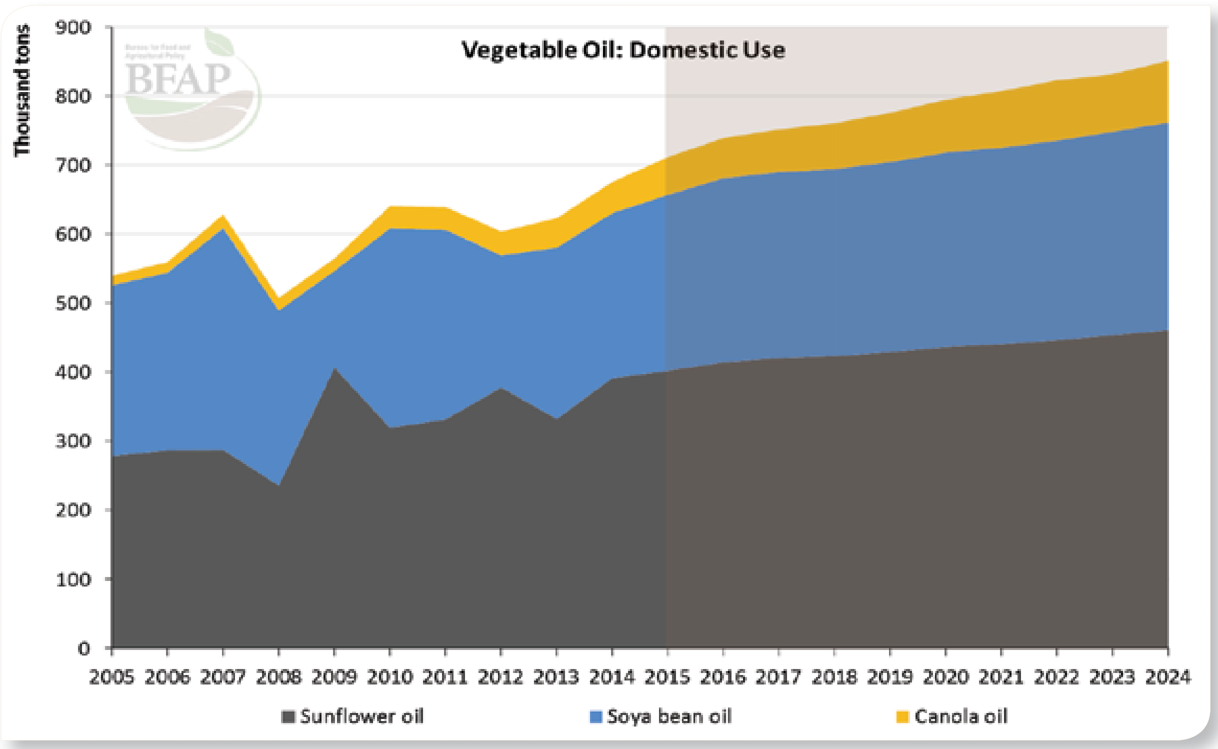


Figure 6.13: *Vegetable oils: Domestic Use*

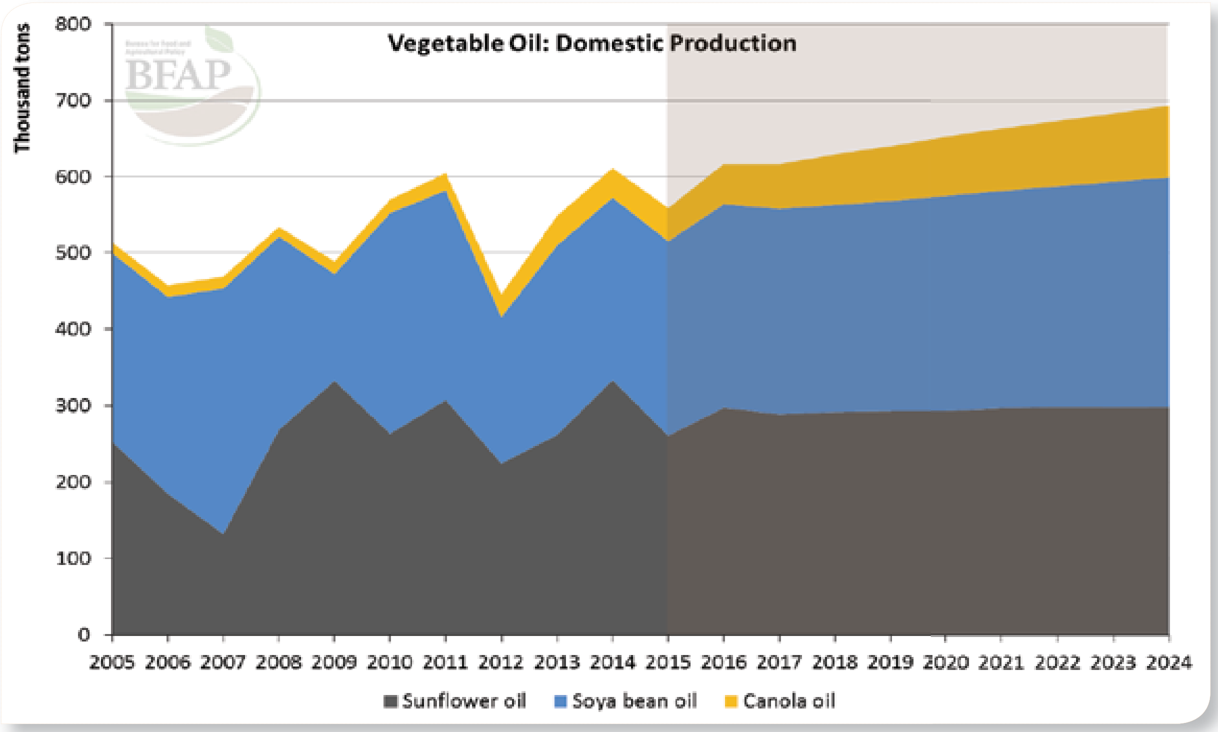


Figure 6.14: *Vegetable oils: Domestic Production*

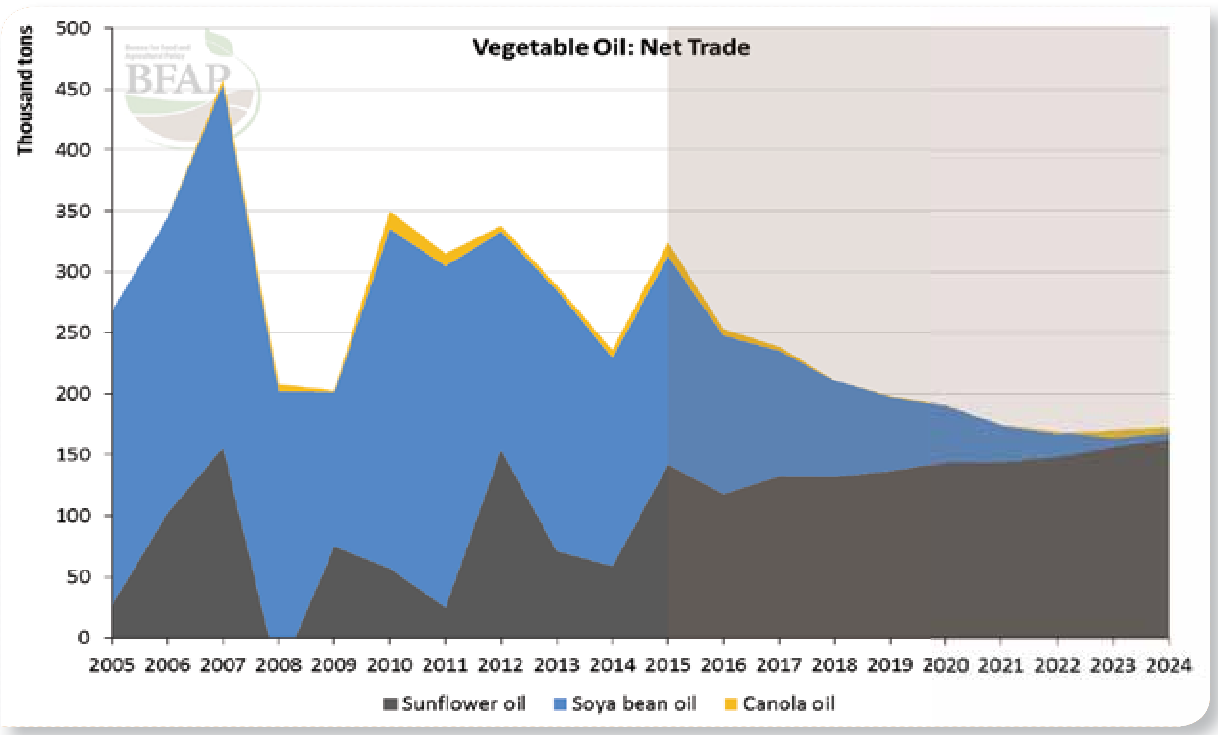


Figure 6.15: *Vegetable oil: Net Trade*

South African Outlook

SUGARCANE AND SUGAR

For the past decade the South African sugar industry has been grappling to come to terms with much tighter profit margins, mainly due to stagnant and in some areas even declining yields, combined with rising input costs.

For the past decade the South African sugar industry has been grappling to come to terms with much tighter profit margins, mainly due to stagnant and in some areas even declining yields, combined with rising input costs. In the coastal regions, the prevalence of Eldana (African sugar cane borer) has forced growers to shorten their cutting cycles, impacting negatively on yields as well as the quality of cane delivered. In recent years yields have also been affected by exceptionally low rainfall conditions. Particularly during 2014 and 2015, precipitation has fallen well below long term average levels and within the South African sugar industry, 2015 will be remembered as the worst drought in 103 years. The severity of the drought has impacted heavily on yield levels and consequently, total cane production is projected to drop to 14.2 million tons in 2015, compared to 17.7 million tons in 2014 and 20.3 million tons in 2013.

The financial position of the industry has also resulted in a large number of seasonal farm workers not being employed in the current season as farmers struggle to make ends meet. The drought comes at a time where a number of mills have already been struggling with lower throughput and consequently lower profit margins for several years. As a result, the Umzimkulu mill remained closed for the season and it is likely that a number of other mills will also open for only a very short period, as continued lack of rain has caused a further reduction in crop estimates.

After losing close to 60 thousand hectares over the period from 2001 to 2012, the area under cane has remained relatively stable over the past three years and is also expected to remain relatively stable around these levels over the outlook period. Industry experts argue that most of the land with marginal production potential has fallen out of production and although the number of growers may continue to consolidate as the average farm size continues to expand, no further drastic shifts in the area under production is projected under the baseline assumptions. The baseline further assumes relatively normal rainfall conditions and under this assumption it is expected that production will recover to levels of around 18 million tons of cane and consequently more than 2 million tons of sugar over the baseline period. Since this increase in production is likely to come from the lower base of hectares, yields are anticipated to increase gradually over time.

At its peak in 2001, the sugar industry exported close to 1.5 million tons of sugar. In the current marketing season, exports are expected to drop to barely 50 thousand tons due to the drought. Over the baseline, exports of sugar are expected to average around 500 thousand tons per year. Nonetheless, the industry will face continued pressure from imports as the global market remains in over supply. The pricing mechanism of sugar remains the main reason for rising competition from imports. The sugar market basically still operates as a single market, where prices of both sugar and RV continue to escalate at an inflationary rate. This trend will likely expose the industry to the low world market prices and without adequate tariff protection, the industry runs the risk of losing even more market share to Brazilian and other deep sea imports.

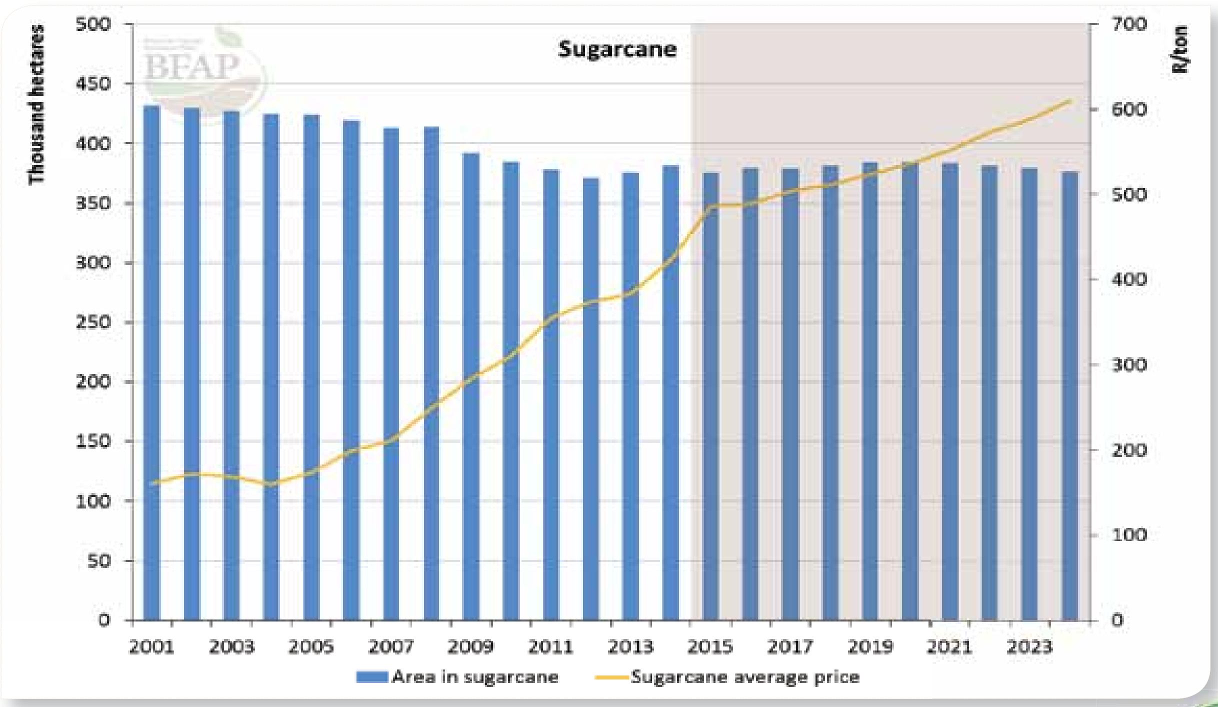


Figure 7.1: *Sugarcane area and price*

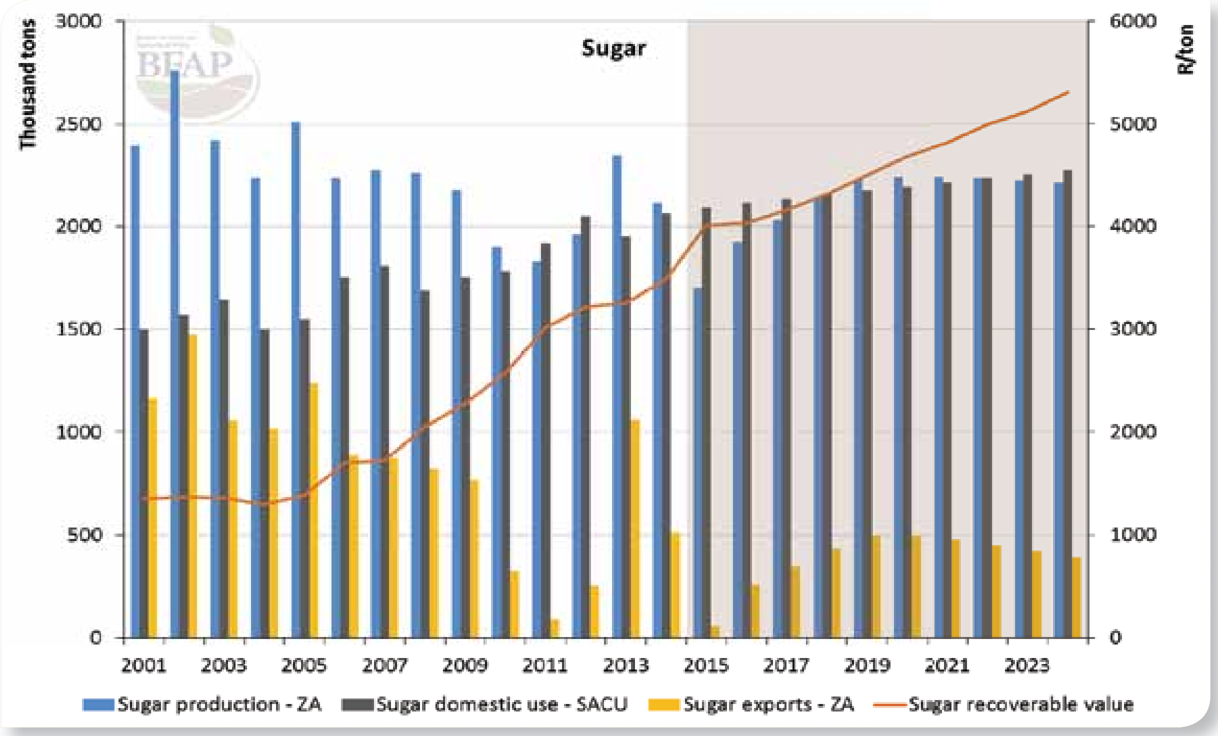


Figure 7.2: *Sugar production, consumption and the RV price*

World market prices have hit their lowest levels in 6 years as a result of high world market stock levels. The situation in the EU is similar and the low prices there have resulted in SADC sugar producers searching for alternatives. At this stage it seems likely that the SACU market will also be exposed to the SADC sugar producers, which in turn could displace more SA sugar onto the world market.

The industry is currently reviewing a number of its processes and planning strategic interventions to bring sustainability back into the production and processing of sugarcane and sugar. A new Sugar Act has been developed by the industry. Under the new Sugar Act, it is envisaged that the principle of vertical slicing will be introduced, which provides the opportunity for growers to share in the revenue of sales of products other than cane and molasses, such as bioethanol. This implies that the industry will also be in need of a revenue sharing model that goes beyond the current division of proceeds based on the sales of sugar and molasses only. Apart from catering for alternative sources of income in a new payment system, one also has to ensure that a new cane payment system drives the correct incentives and rewards for efficiencies and investment in alternative sources of income.

Unfortunately, these alternative sources of income have not materialised to date, despite many years of negotiations between industry and government. Bioethanol production in South Africa has yet again taken a step backwards as the position paper has been referred back to the Biofuels Task Team for further review. A number of concerns were raised by various government departments, which included the subsidy mechanism and the risk and exposure that it creates for the fiscus, the length of the subsidy period, the risk to food security and the level of the guaranteed return on investment. It is somewhat ironic that the biofuels industry has been given ‘market access’ at 2% from the 1st of October 2015 but has not been afforded a pricing framework in which sufficient production can take place to meet this demand. The current review of the policy is largely driven by the National Treasury and it is unclear when any further information on the progress will be forthcoming.

Cogeneration of electricity has been under discussion in the sugar industry for the past 5 years. The potential that the sugar industry can offer is equivalent to a total of 700 MW of renewable electricity given the necessary policy support. 2015 saw the policy framework for cogeneration being released by the Department of Energy but unfortunately it seems to be based on providing immediate short term relief to the national electricity grid rather than long term sustainable solutions. Consequently, if the tariff and framework is not suitable, the likelihood that sugar millers in South Africa will invest significantly in expensive power island equipment remains small.

In conclusion, it is essential for the industry to regain positive sentiments and enter a cycle of re-investment in the future. Industry experts argue that apart from the economic realities, a number of external influences have contributed to the decline in hectares under production and tighter profit margins at the mills due to lower throughput. These factors include urbanisation in the coastal regions, land claims and unsuccessful land reform projects in the Midlands areas. A general lack of incentive to reinvest in the establishment of new ratoons is evident, since almost 30% of the sugarcane area is currently under land claims. Going forward, a strong partnership between the industry and government, which delivers on the set targets and actions, is essential to provide an enabling environment for the industry to regain the capacity that has been lost.

South African Outlook MEAT

Following several years of high and volatile feed grain prices, which resulted in uncertain profits in the livestock sector, the commodity cycle has moved in favour of livestock production.

Meat – Global

Following several years of high and volatile feed grain prices, which resulted in uncertain profits in the livestock sector, the commodity cycle turned in favour of livestock production once more in 2013. By 2014, the FAO cereal price index had declined by 19% from 2012 highs, while global maize prices had declined by almost 30%. In contrast, meat prices attained record levels in 2014 and the FAO meat price index rose 9% above 2012 levels. Whilst the demand for meat products remains firm, there was a confluence of factors affecting the supply response that supported prices at these levels. After several years of cow herd liquidation resulting from a combination of economic factors, disease and extreme weather conditions, improved profitability has induced a cow herd rebuilding phase, particularly in the United States, driving beef prices higher. Furthermore the persistent impact of the Porcine Epidemic Diarrhoea virus (PEDv) restricted pork supply, sending prices upwards, whilst general substitutability between meats supported demand and hence also prices for poultry products.

Over the Outlook, beef prices are projected to start a downward cycle from 2016, declining steadily to 2020 as the impact of increased inventories becomes evident in the market. Pork and poultry producers in particular use feed grains intensively in the production system and will benefit the most from reduced feed prices. Furthermore, a shorter production cycle allows for a quicker supply response and with the effects of PEDv abating, a declining trend has been evident in both pork and poultry prices in recent months. Despite the projection that meat prices will decline over the medium term, the OECD-FAO advocates that the outlook for meat production remains largely positive. Under the assumption of normal weather conditions, feed grain prices will remain subdued and consequently meat to feed price ratios remain favourable relative to the past 5 years.

The OECD-FAO Outlook projects further expansion of global consumption over the next decade, concentrated in the developing world where income levels are rising and populations continue to expand. In contrast, meat consumption in many developed regions has reached saturated levels and, given slow population growth, the rate of meat demand growth remains marginal. Poultry continues to dominate the meat complex. In addition to favourable relative prices, it represents an accessible meat type that remains free of the cultural barriers that impact pork consumption and consequently poultry accounts for just over half of the additional meat demand globally by 2024, followed by pork (26%), beef (15%) and sheep meat (6%).

Several uncertainties could potentially impact meat production and particularly trade over the Outlook. The Russian import ban has already resulted in some trade diversion, impacting negatively on the demand for meat in the EU. At the same time, the potential impact of disease outbreaks in meat markets was well illustrated by the rise in US pork prices as a result of PEDv in 2014. Recent outbreaks of Avian Influenza in the US have also resulted in some trade restrictions. A prolonged outbreak could further impact on price levels.

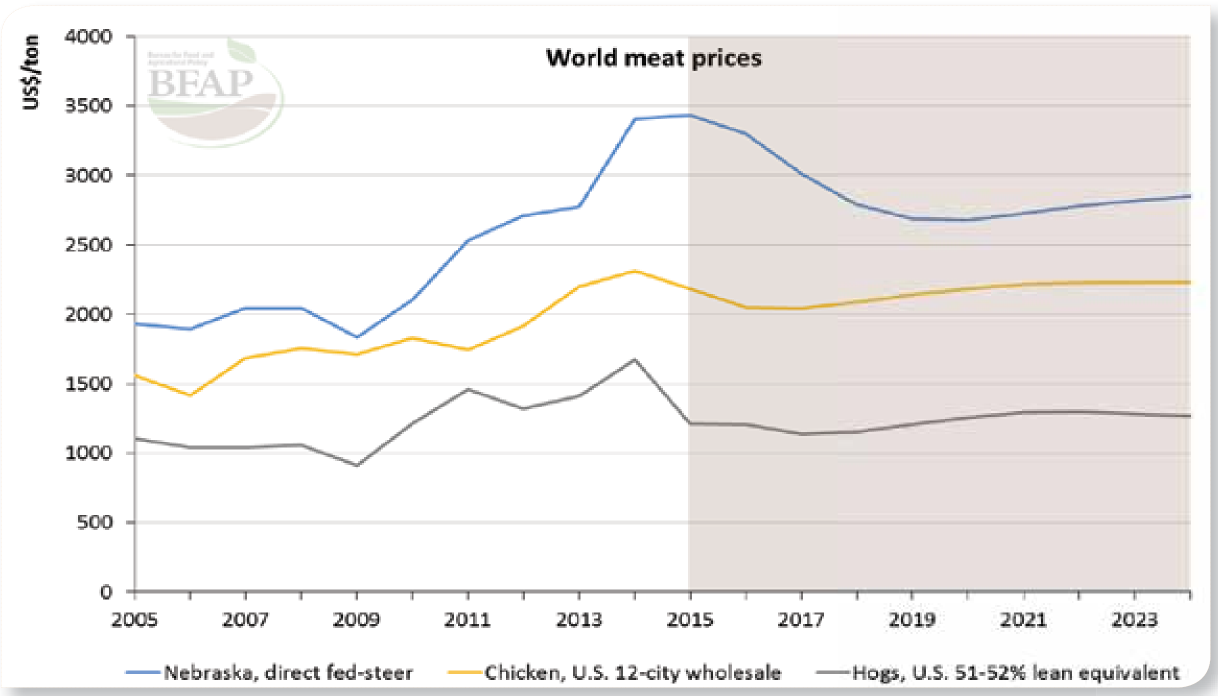


Figure 8.1: *World meat prices*

Source: FAPRI & BFAP updates

Meat and eggs – South Africa

South African livestock markets have been characterised by the same volatility and uncertainty evident in global markets in recent years. The degree to which these global fundamentals impacted on domestic markets varied however, due to inherent differences in equilibrium pricing conditions which cause individual meat markets to respond differently to changes in exogenous drivers, despite the substitutability between meat types. Similarly, production systems are fundamentally different; poultry and pork production rely heavily on intensive use of feed grains, while beef production exhibits greater flexibility in feeding systems and most mutton and lamb is produced in extensive, pasture based systems. Consequently, these markets are subject to greater variation in supply under extreme weather conditions.

While 2013 marked a return to profitability in the global context, domestic producers were denied the same relief as a combination of severe drought conditions in South Africa and neighbouring countries as well as substantial depreciation in the exchange rate resulted in persistently high feed prices. The same drought conditions induced a significant oversupply in the beef market both from South Africa and neighbouring countries, depressing prices, despite the upward trend in global markets. Whilst prices increased sharply in 2014, cattle slaughter numbers increased for the second consecutive year, which would indicate that domestic producers have yet to enter a phase of herd rebuilding, despite improved profitability. The effect of drought conditions was also evident in lamb and mutton supply, where an increase of more than 17% in domestic slaughter numbers in 2013 was followed by another, albeit smaller increase in 2014. Despite these additional slaughters, South Africa remains a net importer of sheep meat and domestic prices largely followed international trends.

Domestic pork and poultry production also continues to be supplemented by imported products and consequently, global price trends transmit fairly well into domestic markets (Figure 8.2). Within the pork market, imported products have an important role in balancing domestic demand and consequently, the bulk of imports consist of ribs and ham. Similarly, inherent differences in the global demand for various chicken cuts results in some cuts being imported more competitively and in larger volumes than others. Consequently, the sensitivity of domestic prices to import parity prices also differs across product types. In 2013, rising import parity prices induced an increase of 9.5% in the price of whole frozen chicken, while the price of individually quick frozen (IQF) pieces increased by only 4% in the same period. In 2014, prices increased more evenly across product types - whole frozen chicken prices reflected a further increase of 10%, compared to an 11% rise in IQF prices.

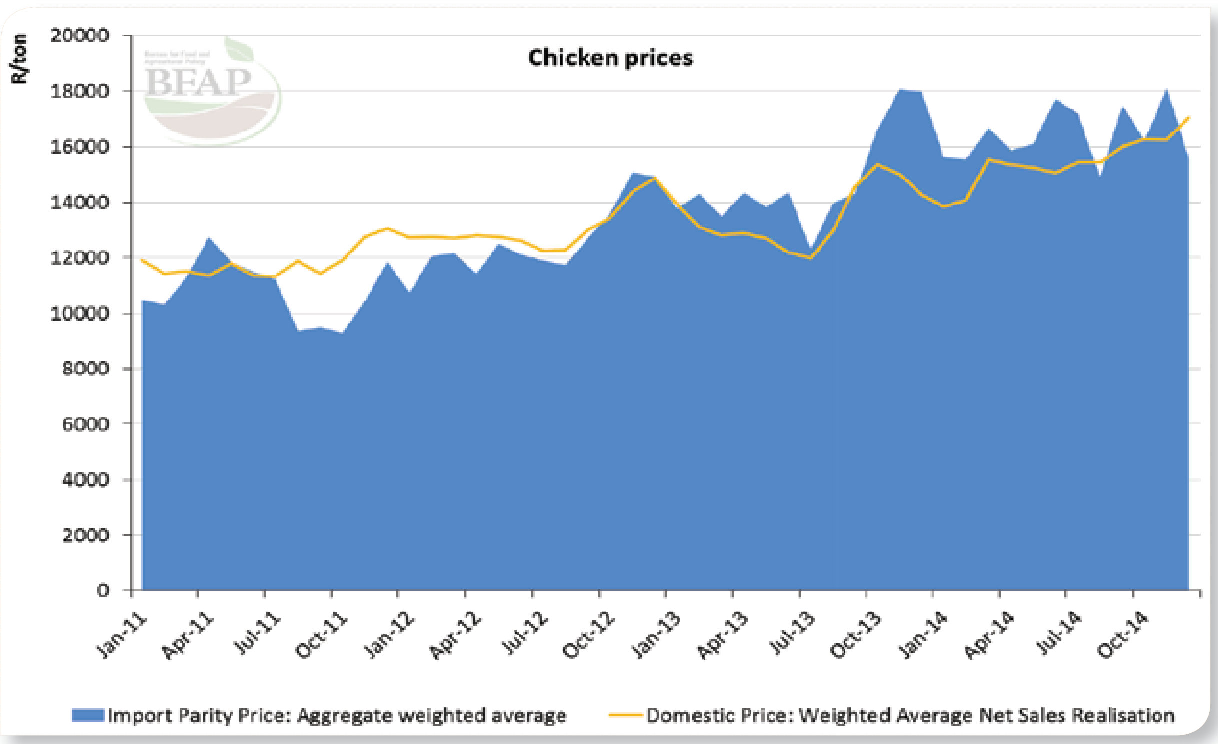


Figure 8.2: *Chicken domestic price vs. import parity price comparison*

The intensive nature of the production systems renders producers of pork and poultry particularly vulnerable to rising feed costs. While the cost of feed arguably remains an important factor affecting domestic price negotiation, the availability of competitively priced imports often constrains the extent to which meat prices follow feed costs higher. Following the record levels attained in 2012, the persistence of drought induced high feed prices in 2013 and resulted in extreme pressure on producer margins, as the price of IQF chicken pieces (the bulk of chicken produced in SA) and the average price of class BO and BP pork increased by only 4% and 3% respectively. 2014 marked a turnaround however, as the combination of a depreciating exchange rate and rising world prices resulted in an increase of more than 10% in domestic chicken and pork prices, whilst a bumper crop depressed domestic feed grain prices. Following the drought conditions experienced in early 2015, domestic producers will again face higher feed prices than their international counterparts; however persistently high international meat prices, combined with continuous depreciation of the exchange rate have supported firm domestic meat prices to date.

Over the Outlook, continuous depreciation of the exchange rate will increase the cost of imported meat, supporting domestic price levels. The exchange rate depreciation will however also impact on feed and expansion costs. In the long run, the chicken to maize price ratio in the United States remains well above the same ratio in South Africa, illustrating that poultry production in the United States remains more competitive than in South Africa. In the beef market however, where the degree to which international prices are transmitted to the domestic market is less than poultry, production in South Africa compares very well to global norms, both historically and over the outlook, as the domestic beef to maize price ratio remains above the same ratio in the United States from 2017 onwards (Figure 8.3).

Meat consumption in South Africa has expanded rapidly over the past decade and while continued growth in meat consumption is projected in the coming decade, a confluence of macroeconomic factors results in higher meat prices and slower consumption growth relative to the past. Income growth remains the core driver of rising meat consumption and hence the cautious outlook for income growth in South Africa is a fundamental factor underlying slower demand growth. Furthermore, relative prices and consumer preferences drive the choice between various meat types over time. Chicken remains the most affordable source of protein and while consumption is projected to increase by only 38% over the next decade (compared to 60% through the past 10 years), it continues to dominate the meat market, accounting for 65% of additional meat consumed by 2024. This equates to more than 700 thousand tons of additional poultry consumption by 2024, surpassing 44kg per capita. Having increased by 42% over the past decade, pork consumption will expand by a further 33%

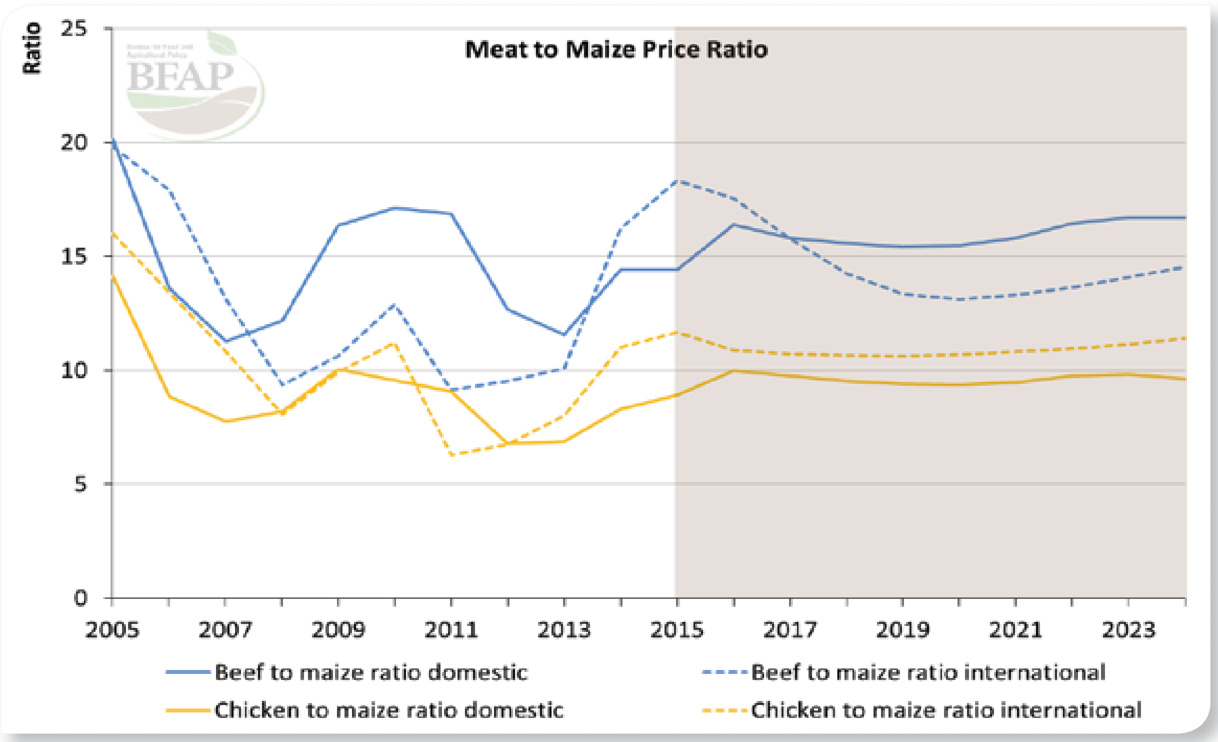


Figure 8.3: *Meat to maize price ratios: South Africa vs. United States of America*

over the outlook, which equates to almost 75 thousand tons and represents just over 7% of additional meat consumption by 2024. The demand for beef is projected to increase by almost 28% through the next decade (compared to 15% through the past 10 years), resulting in almost 200 thousand tons of additional beef consumption by 2024. As the most expensive meat alternative, lamb / mutton is typically consumed by higher income consumers that spend a smaller portion of their budget on food and are less sensitive to changes in price levels. Consequently, sheep meat consumption is projected to expand by just over 17% by 2024, following a contraction through the past decade (Figure 8.4).

Following substantial growth from 2004 to 2008, domestic poultry producers have found their margins under pressure and while domestic production has failed to expand sufficiently to meet growing demand over the past 5 years, imports have spiralled. With chicken consumption projected to surpass 2.5 million tons by 2024, surpassing 45kg per capita, a return to more favourable meat to feed price ratios will support production levels, resulting in expansion to just over 2 million tons by 2024. Imports in excess of 550 thousand tons will supply the balance. Continued uncertainty related to the impact of concessions on current anti-dumping duties applied to bone-in chicken portions originating from the US could result in substantial price impacts and consequently also affect production growth (Box 8.1).

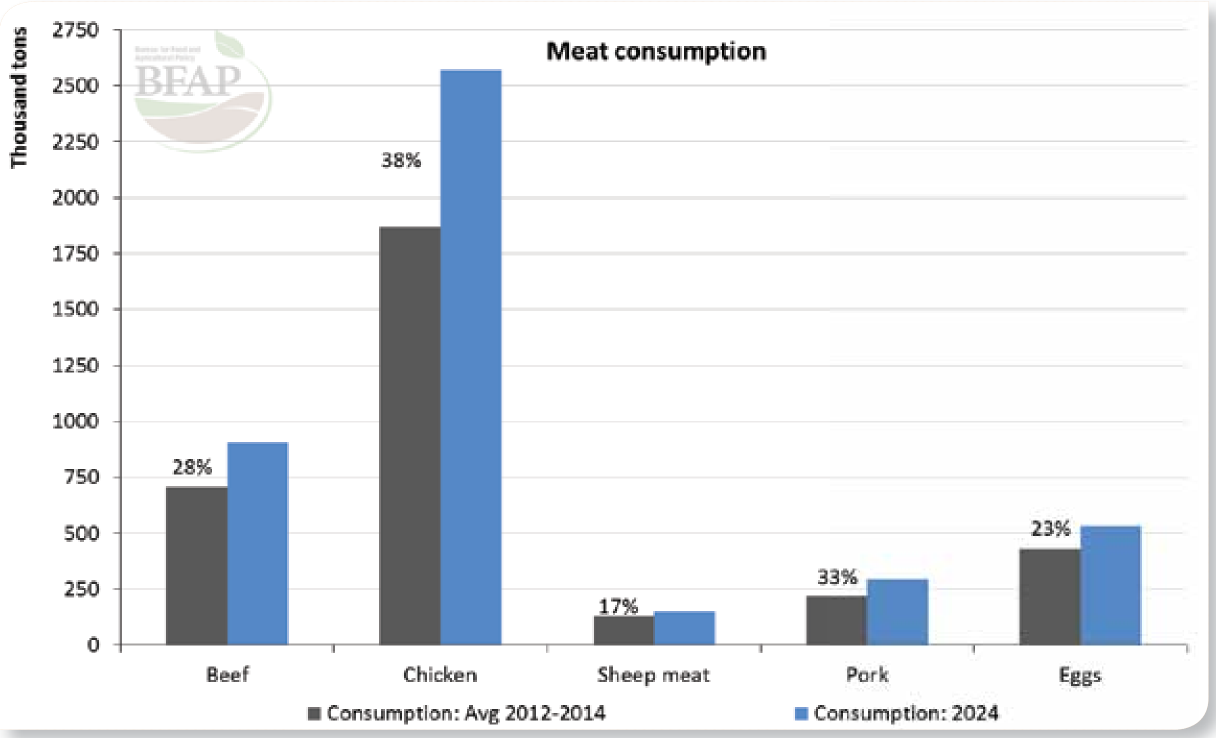


Figure 8.4: *SA meat consumption*

Box 8.1: Competitiveness of South African broiler production and the potential impact of AGOA related concessions on US anti-dumping duties[9]

As the largest contributor to the South African agricultural sector, the importance of the broiler industry cannot be denied. Chicken remains a preferable and affordable source of protein, yet the industry's ability to compete within the global context and the implications for its long term sustainability has been questioned in light of growing imports to meet domestic demand. From 2001 to 2012, chicken consumption in South Africa increased by 74%, almost 800 thousand tons. Of the additional meat consumed over this period, 65% was produced domestically, with imports accounting for the balance. Since 2010 however, almost 200 thousand tons of additional chicken has been consumed, yet only 35% was produced domestically, with imports accounting for 65%.

In light of these numbers, questions have been raised regarding South African producers' competitiveness in the global context. In order to ensure its competitiveness, a number of trade measures are applied within the industry. In 2013, an application for an increase in the general duty applied on imported products was approved, yet the composition as well as the origin of imports diminished the impact of these duties on domestic prices, as products originating from the European Union (EU) remained duty free under the Trade, Development and Cooperation agreement (TDCA). Furthermore, anti-dumping duties have been applied to bone-in portions originating from the United States (US) for more than a decade and in 2014, the industry applied successfully for additional anti-dumping duties on bone-in portions originating from the United Kingdom, the Netherlands and Germany. Beyond the level of tariffs however, the underlying reasons behind the lack of competiveness will need to be addressed in order to ensure the long run sustainability of the sector.

Evaluation of South African broiler production in the global context reveals a value chain and production system that is very similar to the leading global producers. Integrated value chains dominate, with the crucial broiler production phase contracted to individual producers. South African companies employ a pricing system that is similar to the tournament pricing used successfully in the US and, based on technical efficiency indicators, South African producers compete well against international counterparts. When the cost of production is considered however, the picture changes, largely as a result of feed cost differentials. Countries such as the US and Brazil are net exporters of both maize and protein meal, implying that domestic prices tend towards export parity levels. In South Africa, maize prices also tend to trade at export parity levels in most years, however more than 40% of soya bean meal used domestically is imported from Argentina, resulting in import parity based pricing and a substantial difference in cost relative to producers in the US and Brazil. Figure 8.5 illustrates that South African feed costs on a per ton basis remain significantly higher than the US and Brazil, but below the levels recorded in the EU. Feed accounts for up to 70% of variable production costs per cycle and also influence the cost of day old chicks. Hence differences in feed costs are considered the main driver behind differences in production costs across these regions.

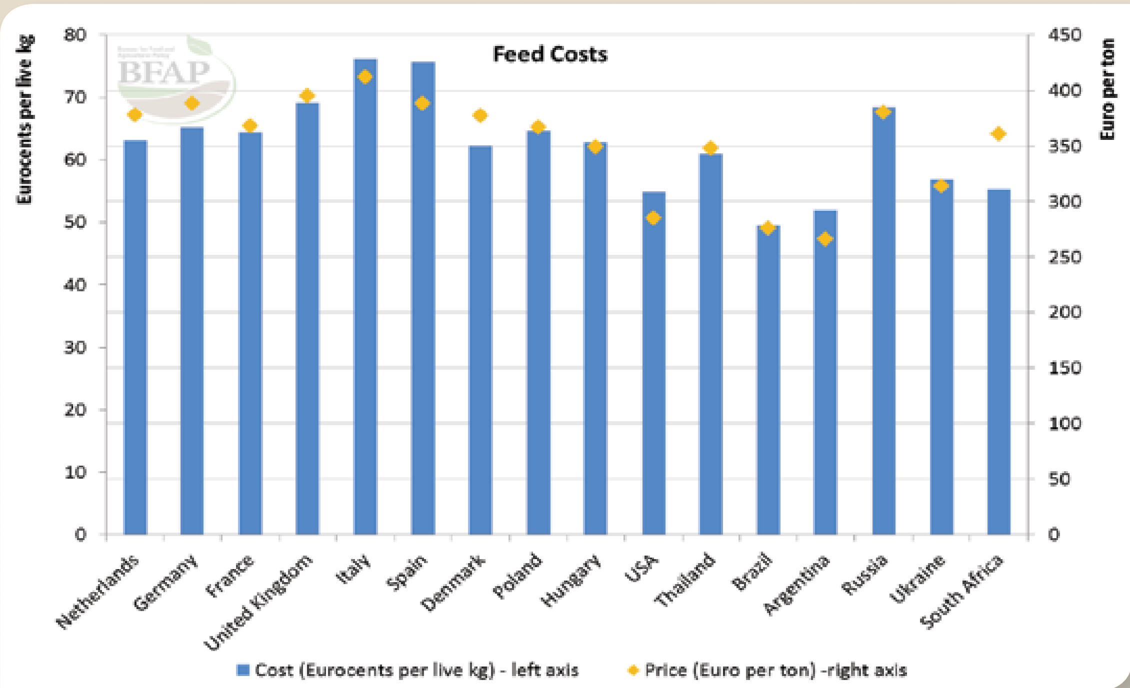


Figure 8.5: *Feed cost comparison*

Source: Van Horne & Bondt, 2014

[9] Extract from the report "Evaluating the competitiveness of South African broiler production", compiled by BFAP for the Industrial Development Corporation of South Africa in 2015.

In addition to the differences in feed costs, inherent differences in the demand for different chicken cuts globally have resulted in vastly different marketing strategies. In South Africa, bone-in portions are in high demand and individually quick frozen (IQF) pieces comprise the bulk of the market. In countries such as the US and the EU, strong demand for chicken breasts allows producers to obtain a premium for these cuts and, considering the value of the entire carcass, this enables the sale of bone-in portions, which are in lesser demand, at a reduced price. The compilation of South African imports suggests that the bulk of rising imports over the past 5 years consist of bone-in portions, originating mainly from the EU (Figure 8.6). These differences in marketing strategies have also been the basis for the various investigations conducted into dumping by ITAC.

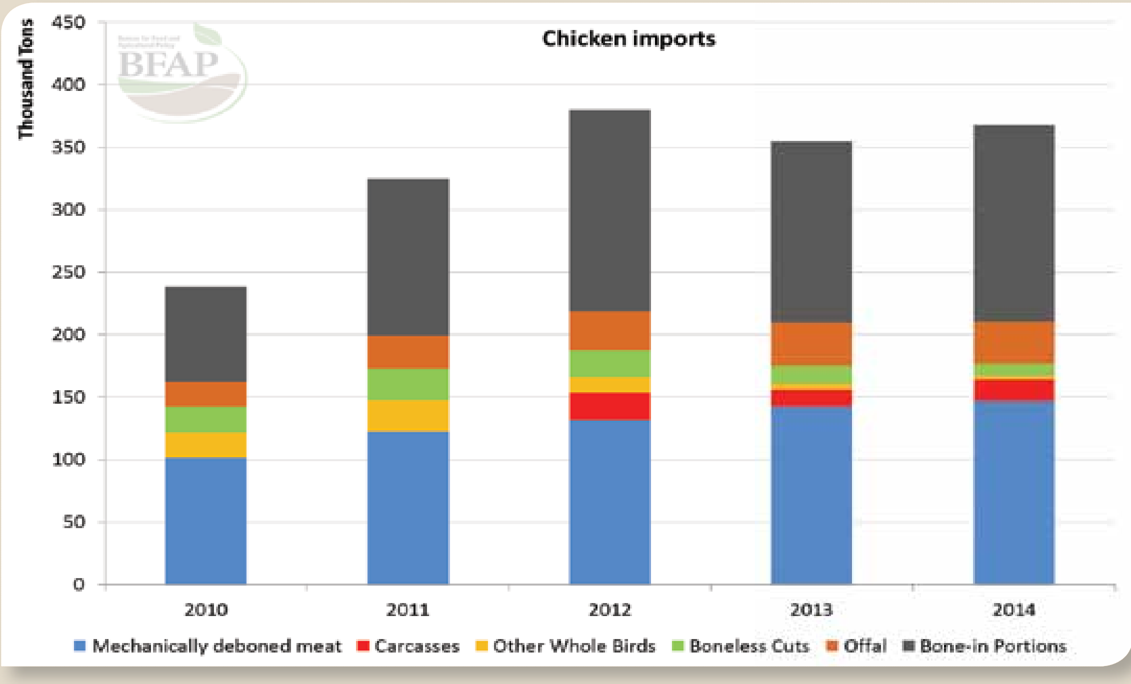


Figure 8.6: *Compilation of chicken imports into South Africa*

Source: ITC Trademap

Whilst the majority of the bone-in portions imported to South Africa have originated from the EU in recent years due to the lack of tariff applied, concessions in allowing a quota of 65 thousand tons of imported bone-in portions from the US in order to aid in the renewal of the African Growth and Opportunities Act (AGOA) have the potential to depress domestic prices over the Outlook. The association of meat importers and exporters (AMIE) indicates that in May 2015, the CFR price of bone-in portions originating from the US is almost 35% below the CFR price of bone-in portions originating from the EU. Considering the fact that US products would be subject to a 37% duty, this still relates to a difference of almost 10% in the price of imported products if US products were to displace products currently originating from the EU. Figure 8.7 presents the simulated impact of 2 different scenarios on domestic chicken prices in South Africa. Under current negotiations, a scenario where the current anti-dumping duty is removed from all US bone-in portions seems highly unlikely; however the size of the quota imposed will be a determining factor in measuring the implications of the concessions. In June 2015, this quota was set at 65 thousand tons. Scenario 1 represents the complete removal of current anti-dumping duties, while scenario 2 illustrates the impact of an anti-dumping duty free quota of 65 thousand tons. If all other exogenous factors remain constant, the imposition of a 65 thousand ton quota will reduce the domestic price of IQF portions by an annual average of approximately 3% over the next decade, relative to baseline projections. In an industry where margins are small and competitiveness is already being questioned under baseline conditions, the implications of a 3% reduction in domestic prices will be significant.

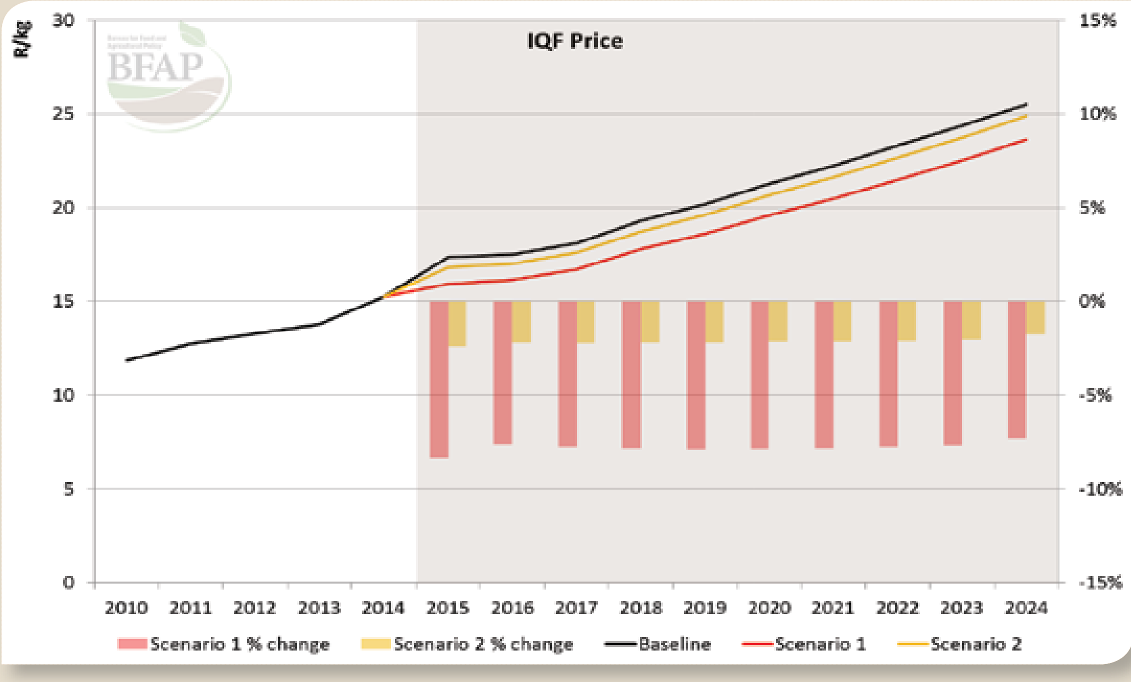


Figure 8.7: *Impact of different anti-dumping duty scenarios on domestic IQF chicken prices in South Africa*

Historically, the chicken to maize price ratio has been a key indicator of profitability in the industry (Figure 8.8), which has been highly uncertain in recent years. Domestic production expanded rapidly in the early 2000's on the back of favourable chicken to maize prices ratios. These same ratios plummeted in 2006/07 and while some expansion was evident in 2010 following reduced feed grain prices, the chicken to maize price ratio has remained well below the levels attained from 2003 to 2005 and consequently production growth has been marginal since. 2012 and 2013 marked record lows that reflect higher feed costs and stagnant chicken prices which caused production levels to decline in 2013. With steady improvement evident from 2014 onwards, profitability ratios are projected to peak in 2016, before stabilising at levels well above those recorded in the past 3 years, placing production on a positive growth path over the Outlook. While many uncertainties will influence the rate at which domestic production levels expand through the next decade, expansion of domestic soya crushing is potentially one of the most significant. Capacity has expanded rapidly in recent years and should crushing expand to the extent that the price of domestically produced protein meal breaks away from import parity levels, profitability related to broiler production will improve substantially, resulting in a rapid increase in production. Likewise, changes in trade policy that depress domestic prices could have the opposite effect, limiting the rate at which domestic production expands.

The extent to which international prices are transmitted into domestic egg markets is much more limited than in meat markets, but the high and volatile feed costs over the past few years have also impacted negatively on South African egg production. Production levels declined for the second consecutive year in 2014 and while the egg to maize price ratio improved significantly in 2014, higher feed grain prices resulting from the drought will limit further improvement in 2015. In the medium term however, egg prices are projected to expand at a faster rate than maize prices on a continuous basis and egg to maize price ratios are projected to return to favourable levels, allowing egg production to expand by almost 25% over the next decade, matching firm consumption growth (Figure 8.9). Trade represents a very small share of the market and by 2024, annual egg consumption will approach 10kg per capita.

While feed costs are an important consideration impacting on profitability of all meat production enterprises, beef production tends to exhibit greater flexibility in the feeding system than pork and poultry. At the same time, climatic conditions have a much greater impact on beef supply and with prices often fluctuating based on shifting supply and demand balances, the beef market is often characterised by exceptional volatility. In addition, typical price cycles remain evident, as stronger prices lead to phases of herd rebuilding, followed by periods of greater supply and softer prices.

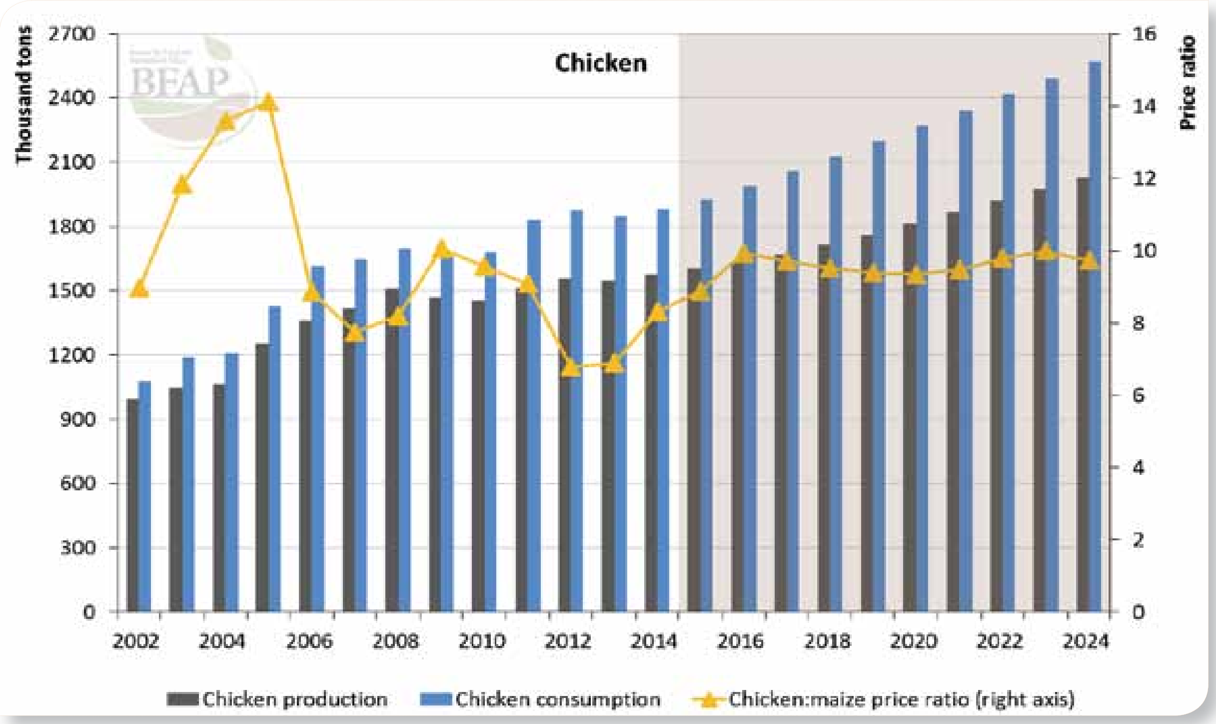


Figure 8.8: *SA chicken production, consumption and chicken-maize price ratio*

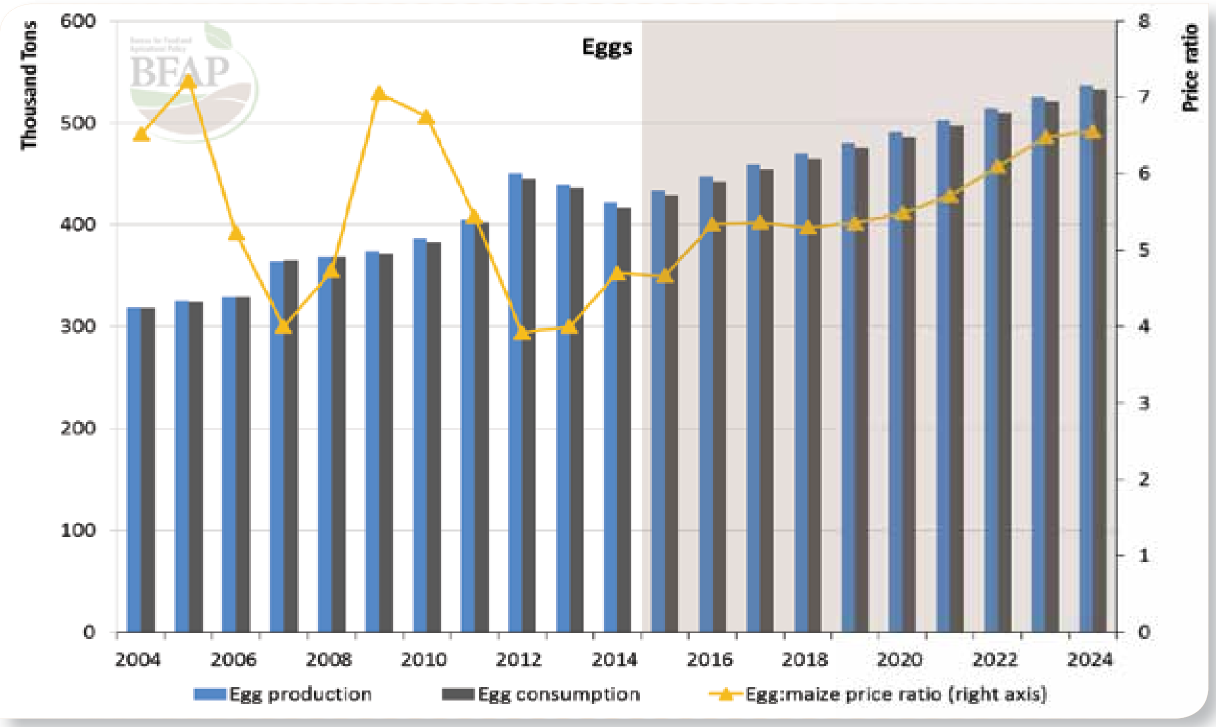


Figure 8.9: *SA egg production, consumption and egg-maize price ratio*

Changing weather conditions over the past few years have undoubtedly impacted on beef markets; slaughter numbers increased sharply in 2013 in response to the drought in South Africa and neighbouring countries, depressing domestic prices despite rising trends globally. In 2014, beef prices increased sharply and while feed grain prices were bearish, no decline was evident in 2014 slaughter numbers, which would indicate that producers have yet to enter a phase of herd rebuilding, despite improved profitability. Persistent drought conditions in the early part of 2015 further exacerbated the situation; at a time when international beef to feed price ratios have increased sharply, domestic feed grain prices have risen following the drought, and while domestic beef prices have reached record levels, producer margins remain tight. In the face of growing demand, prices are projected to increase continuously over the next decade, reaching R57/kg by 2024. This represents an average annual increase of 5.7%, which is marginally above general inflation and hence in real terms prices increase slightly over the baseline. Within this higher price scenario, the potential premium that can be obtained for extensive beef production (grass fed, hormone free) is reduced and in a cycle of lower feed grain prices the prevalence of intensive production systems (feedlots) that convert feed to meat more efficiently is expected to increase. This trend is already evident in a recent survey conducted by the South African Feedlot Association, which showed an increasing number of smaller, privately operated feedlots entering the market.

Maize prices remain an important consideration in intensive beef production. Apart from representing the core source of energy in the feed ration, maize prices tend to influence both the supply and demand of calves. On the demand side, declining maize prices boost feedlot margins, inducing greater demand for calves, whilst on the supply side, maize producers that also manage livestock enterprises typically aim to realise a higher value for their maize by feeding it to calves which are not marketed immediately. Consequently, in years where maize prices are exceptionally low, supply and demand dynamics often result in rapid increases in the calf price.

Calf prices fell sharply in 2012, responding to stagnant demand in the face of declining feedlot margins. In 2013, the drought conditions in South Africa and neighbouring regions were reflected strongly in calf prices, which declined by 6% from 2012 levels. The bumper maize crop in 2014 however marked a return to profitable production and calf prices rebounded strongly, reflecting a 15% increase from 2013 levels. In the short term, calf

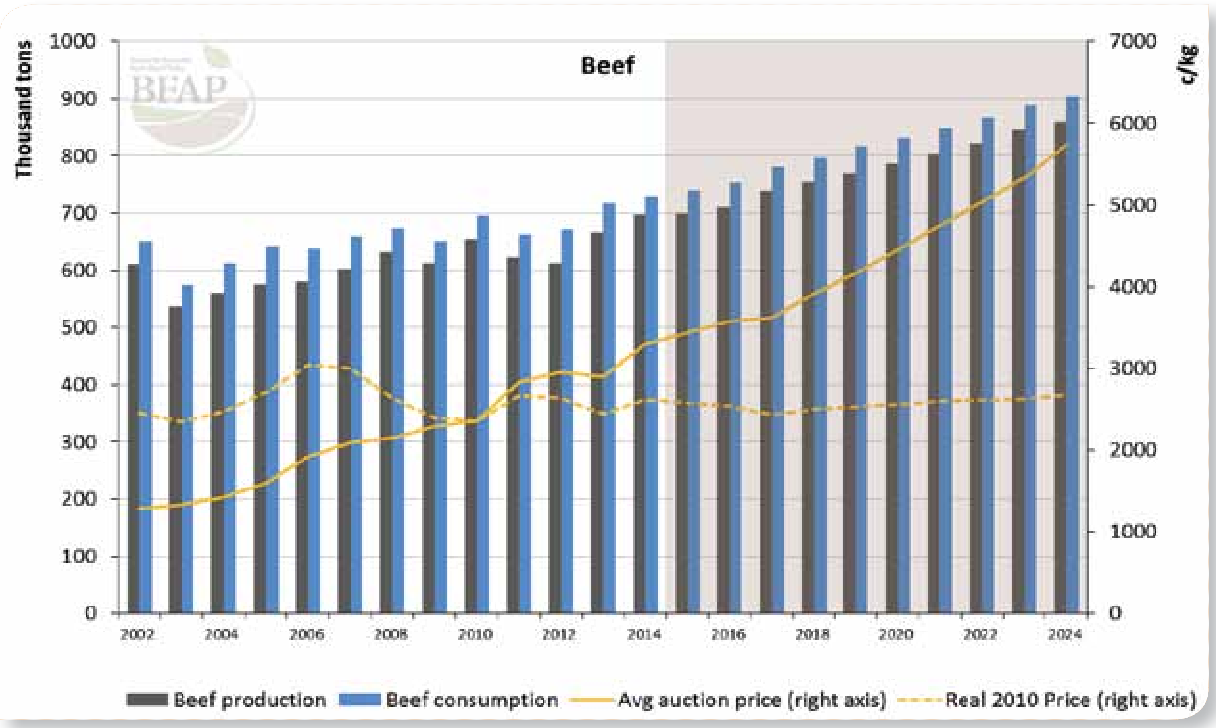


Figure 8.10: *SA beef production, consumption and price*

prices will find further support from reduced herd numbers. In the long run, calf prices are projected to increase at rates similar to beef prices, resulting in relatively stable calf to beef price ratios (Figure 8.11).

In light of its reliance on extensive, pasture based systems, the price of lamb and mutton is also sensitive to extreme weather conditions, not only in South Africa but also globally as South Africa's reliance on imported products creates a strong correlation between world and domestic prices. Having declined from the high levels attained in 2011 which resulted from record international prices and limited domestic supply, lamb / mutton prices came under pressure in 2013. Depreciation of the exchange rate absorbed some of the decline in world prices; however the drought conditions in South Africa resulted in an increase of more than 15% in domestic slaughter numbers. While prices increased sharply in 2014 on the back of rising world prices and a depreciating exchange rate, production volumes increased further, indicating that flock rebuilding has yet to occur following the drought.

Led by import parity levels, the domestic lamb price is projected to increase by an annual average of 4.8% through the next decade. After accounting for general inflation however, this relates to a marginal decline in real prices, and consequently production expands by an annual average of only 1.2% over the next decade. Having declined steadily since 2008, the share of imported lamb in domestic consumption will average 13% in the coming decade, down from 23% in the preceding 10 year period.

Despite rapid consumption growth over the past decade, pork continues to account for a very small share of the South African meat complex, accounting for only 8% of total meat consumed in South Africa in the period between 2012 and 2014. At producer level, pork prices are favourable relative to beef and lamb, with chicken representing the only cheaper alternative. Nonetheless, consumption decisions are made at retail level and a substantial share of pork is consumed as processed products, implying significant value adding prior to consumption. At retail level, products such as bacon represent a relatively expensive meat type, influenced by key cost drivers in the value chain and favoured by higher income consumers. Within these higher income groups, demand is influenced not only by prices, but also several non-economic factors such as consumer sentiments regarding quality, simplicity, convenience and health.

Whilst significant growth in pork production has been recorded over the past decade, rising carcass weights and improved efficiency have been the main constituents of this growth, as opposed to increased sow numbers. While improving efficiency is no doubt positive, significant increases in production in the future will be dependent on continued improvements in efficiency as well as greater investment and expansion of the sow herd. Pork prices are projected to expand by an annual

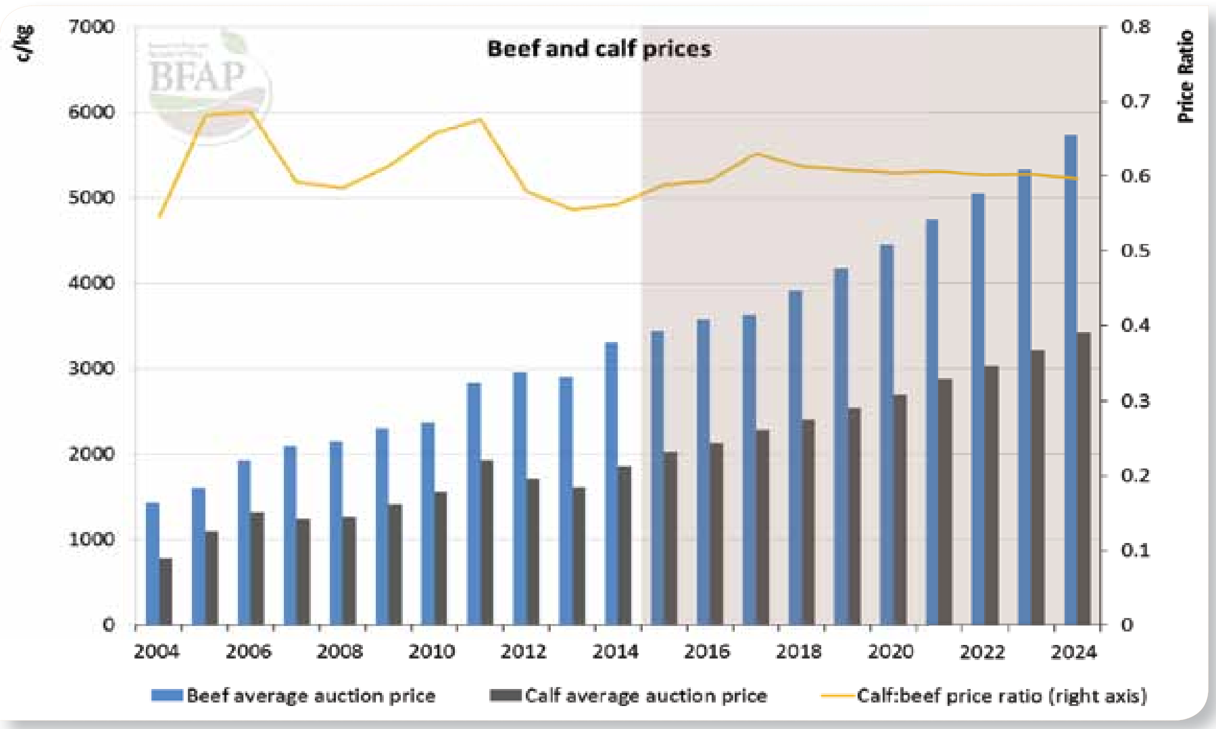


***Figure 8.11:** SA beef price versus calf price*

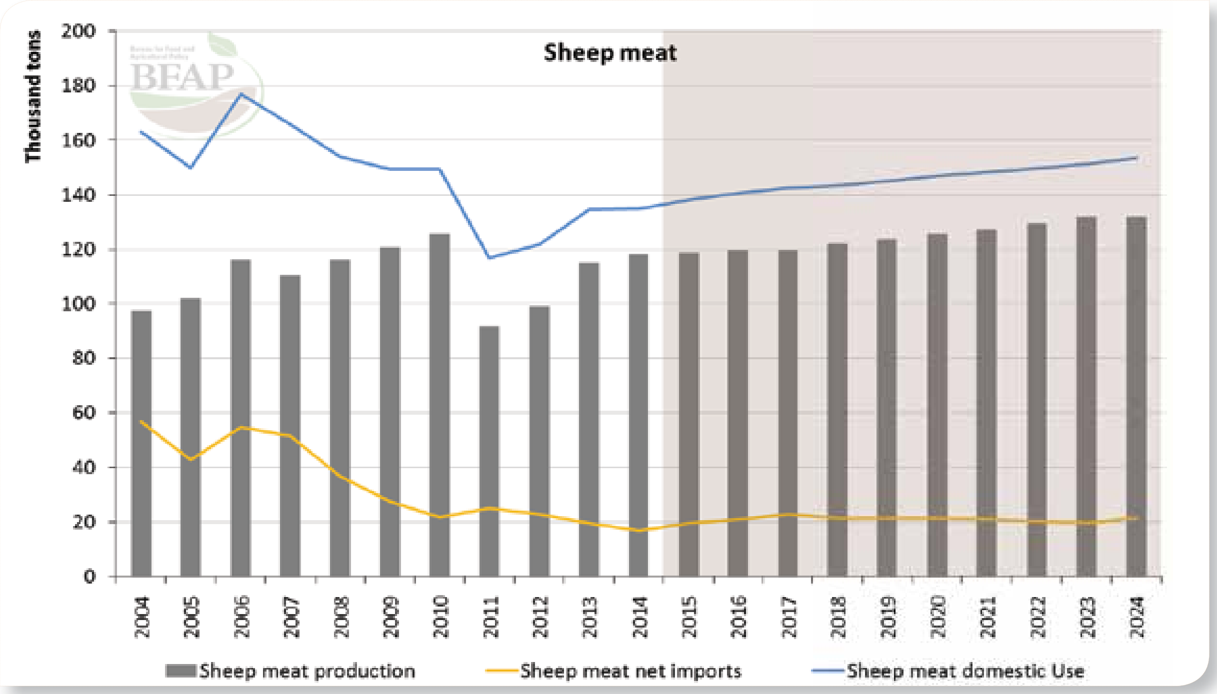


Figure 8.12: *South African sheep meat production, consumption and imports.*

average of just over 6% through the outlook and in light of the expected easing in feed grain prices, the implied improvements in profitability will induce an expansion of 37% in order to meet the rising demand for pork products over the next decade. While the implementation of restrictions on raw pork imports from countries that are not free of the Porcine Reproductive and Respiratory Syndrome (PRRS) virus, combined with a weaker currency, resulted in reduced pork imports for the second consecutive year in 2014, imports have a distinct role in balancing the domestic market by supplying only the cuts in highest demand. As a result, South Africa is expected to remain a net importer of pork products, with imports accounting for approximately 7% of domestic consumption in 2024, down from 8.5% in 2014 (Figure 8.13).

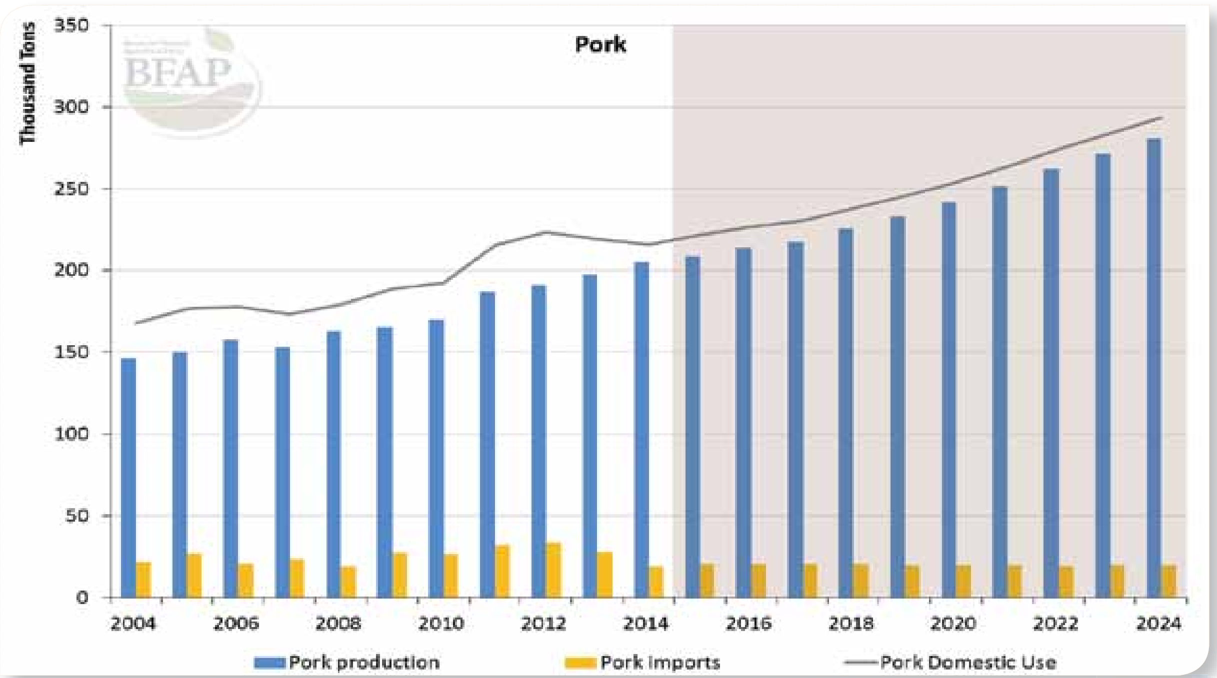


Figure 8.13: *SA pork production, consumption and imports*

South African Outlook

MILK AND DAIRY PRODUCTS

The impact of fluctuating weather conditions has been evident throughout agricultural markets over the past decade. Particularly in the dairy industry, it has been a key driver of market volatility, due to its impact on both the cost of feed and productivity of the global dairy herd.

Milk and dairy – Global

The impact of fluctuating weather conditions has been evident throughout agricultural markets over the past decade. Particularly in the dairy industry, it has been a key driver of market volatility, due to its impact on both the cost of feed and productivity of the global dairy herd. Contrary to most agricultural commodities, only about 8% of dairy production is traded in the global market and in light of the sensitivity of production levels to fluctuating weather conditions, shifts in exogenous drivers in any one of the major dairy producing regions impacts significantly on global price levels. Dairy markets are often characterised by a typically cyclical pattern as price peaks induce a supply response that forces prices down again. The steepness of these cycles in recent years reflect dramatic changes in weather conditions, at times combined with macroeconomic instability that affected demand patterns to create supply and demand dynamics that induce drastic shifts in dairy markets.

Following the economic crisis, which drove prices down from 2007 peaks, dairy prices recovered well through 2010. Good pasture conditions in Oceania and parts of South America induced a downward cycle in the second half of 2011, yet demand held firm and as feed costs spiralled upwards following the US drought, prices bottomed out in mid-2012 at higher levels than the previous downturn in 2009. Persistently high feed prices induced another upward cycle, which was further supported by disappointing production levels in New Zealand in response to unfavourable weather conditions. At the same time, winter conditions in the Northern Hemisphere lasted longer than normal and as Chinese production also declined, prices found further support. Favourable supply conditions in 2014 again coincided with reduced demand as the Russian ban on dairy products from the EU was introduced, while demand from China also stagnated. Reduced feed grain prices have also supported production prospects and by May 2015, the FAO dairy price index had fallen to levels not observed since 2009. Powder prices in particular have fallen sharply on the back of booming production levels.

Following the decline already evident over the first half of 2015, the OECD-FAO outlook expects nominal dairy prices to bottom out in 2015. Firm import demand is projected to induce a marginal recovery to 2017, before prices trade largely sideways over the projection period. In light of firm demand growth, the price of cheese rises more than other dairy products over the outlook period. Accounting for general inflation results in marginally declining prices in real terms, as reduced feed prices boost productivity levels. Price projections reflect

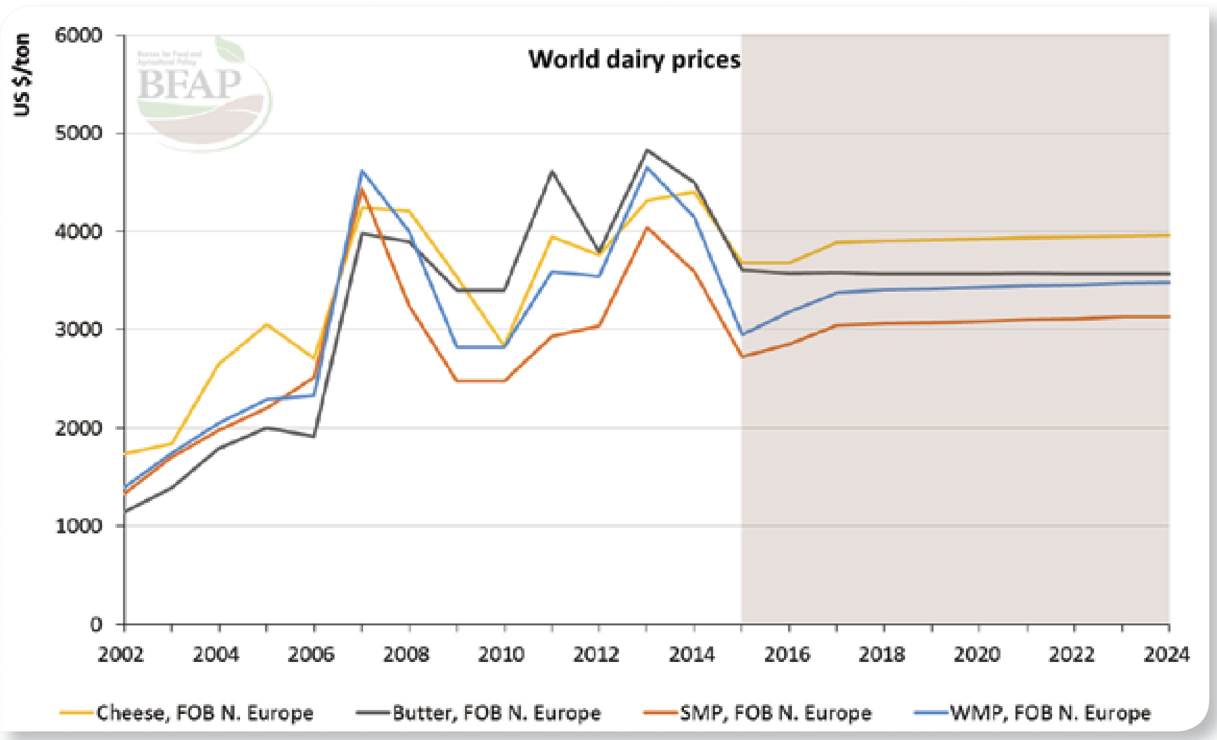


Figure 9.1: International dairy product prices

the assumption of normal weather conditions and given the sensitivity of supply levels to unpredictable climatic conditions, projections could be radically different in the event of inevitable climatic fluctuations (Figure 9.1).

The OECD-FAO outlook projects firm demand growth for dairy products over the next 10 years, dominated by developing countries. Fresh dairy products are consumed in greater volumes than processed products in these regions and consequently the share of fresh dairy products in the global consumption basket is projected to increase over the next decade. Within these developing regions, consumption of fresh dairy products is projected to expand by an annual average of 2.9%. Per capita consumption of dairy products expands much slower, increasing on average by 1.9% p.a. for butter, 1.6% p.a. for skimmed milk powder (SMP) and 1.4% p.a. for cheese and whole milk powder (WMP). Responding to the increasing demand for dairy products, global milk production is projected to increase by almost 170 million tons by 2024 relative to average levels for 2012 to 2014, an average expansion of 1.75% per annum. While the EU system of milk quotas is scheduled to end in 2015, the OECD-FAO Outlook projects a smooth transition, as historic output levels have remained well below EU quota levels for most member states. Trade in dairy products is also projected to expand through the coming decade, led by SMP (2.7% per annum) and WMP (2.3% per annum).

Milk and dairy – South Africa

As in the global market, seasonality and production cycles are typical in the South African dairy sector. In line with global trends and the perishable nature of the products concerned, trade continues to represent a very small share of fresh dairy consumption domestically, resulting in a tight balance of supply and demand and consequently a volatile domestic market. This volatility is further exacerbated by the sensitivity of production levels to climatic conditions, reflecting fluctuations in the levels of feed use due to changes in milk to feed price ratios, as well as the impact of weather conditions on productivity in traditional pasture based systems.

South African milk production is utilised in 2 different market segments; liquid milk products (including pasteurised milk, UHT milk, yoghurt and buttermilk) account for just under 60% of total dairy consumption, while concentrated products (including cheese, butter, milk powders and condensed milk) make up the balance. The volatility evident in the market for fresh products is significantly reduced in concentrated products, mainly due to the nature of these products, which allows a greater role for international trade in correcting domestic supply and demand balances.

Following a steady decline from 2008 to 2011, the producer price of raw milk turned sharply upwards in 2012 in response to elevated feed grain prices that coincided with unfavourable weather conditions and firm demand for dairy products. While these elevated price levels induced the expected supply response, demand remains firm and consequently nominal prices have also been on an upward trend since 2011. Despite the decline in international prices of dairy products, South African prices remain firm as a result of significant exchange rate depreciation and by March 2015 the producer price of raw milk, in nominal terms, had reached record levels. Feed prices are however also higher resulting from the domestic drought conditions. Following a largely sideways movement in 2016 on the back of lower international dairy product prices and the anticipated reduction in feed prices under normal weather conditions, the price is projected to grow at an average rate of 5.4% per year over the next decade, resulting in relatively stable prices in real terms after accounting for general inflation (Figure 9.2).

Despite the volatility in the market, South African milk production has reflected an upward trend, expanding in response to rising demand over the past decade. By 2014, raw milk production approached 3 million tons, and in the early part of 2015, milk deliveries reached unprecedented high levels in response to the recovery in milk to feed price ratios in 2014. Considering seasonality typically evident in milk production, 2015 looks set to be a year of record production in excess of 3 million tons. In the medium term, milk to feed price ratios are projected to remain favourable under normal weather conditions, inducing an expansion of 28% in milk production over the next decade (Figure 9.2).

The demand for concentrated dairy products has expanded rapidly over the past decade, led by cheese consumption, which more than doubled by 2014 relative to the average level consumed between 2002 and 2004. Rising income levels per capita have been a fundamental driver behind this expansion and despite caution in the short term, income growth is projected to recover over the projection period; coupled with continued urbanisation, this is expected to induce further demand growth. In line with historic trends, consumption of concentrated dairy products, at 3.5% per annum, is projected to outpace growth in the demand for fluid products, which is projected to expand by an annual average of 2.3% over the next 10 years (Figure 9.3).

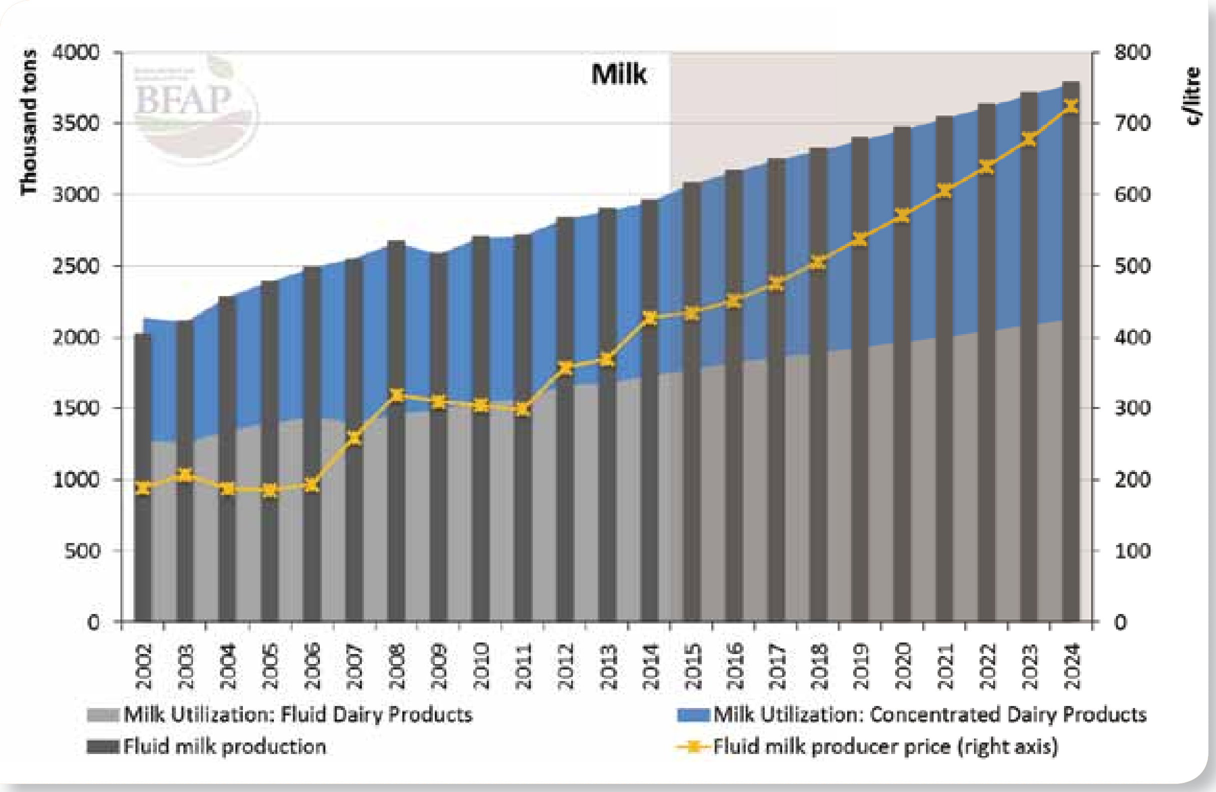


Figure 9.2: *South African milk production, utilisation and price*

The demand for cheese continues to grow faster than any other dairy product and while slower relative to the past decade, a 51% expansion in cheese consumption still relates to more than 42 thousand tons of additional cheese consumed by 2024. Part of this expansion can be ascribed to rising population numbers, yet even on a per capita basis, cheese consumption will expand by an annual average of 3.8%. Butter accounts for a much smaller share of the market and historic demand growth has been much slower than cheese, expanding by 30% over the past 10 years. Consumption growth is projected to remain relatively constant over the outlook, expanding by an annual average of 2.9% per annum (Figure 9.3).

The nature of the production process means that the market for milk powders is strongly influenced by the price and production levels of other dairy products that are produced simultaneously. Consequently, consumption of milk powders has been characterised by exceptional volatility over the past decade. Nonetheless, the trend has remained upwards and over the 10 year period, domestic use of WMP and SMP rose by approximately 6.7% and 10.3% per annum respectively. Despite this growth, powders remain a small share of the concentrated dairy market, with consumption of SMP reaching 0.12 kg/capita by 2014, compared to 0.2 kg of WMP consumed per capita in the same year. Thus while the expansion over the next decade of 10.9% per annum for SMP and 6.7% per annum for the more expensive WMP is impressive, per capita consumption levels will expand to only 0.24 and 0.28 kg per annum for SMP and WMP respectively by 2024, relatively constant growth compared to the past decade (Figure 9.3).

Keeping with the rising trend in raw milk prices, prices for the various concentrated dairy products also increased in 2012 and 2013. Trade represents a much greater share of domestic consumption however and consequently the sharp decline in international dairy product prices prevented the increase in domestic dairy prices from reaching the same magnitude as that registered for raw milk. Likewise when international prices turned upwards in 2013, domestic dairy product prices followed and the increase, which was further exacerbated by exchange rate depreciation, exceeded the increase in the raw milk price for all products except butter. Despite softening international prices in 2014, further depreciation in the value of the rand drove domestic prices up further and while international prices in 2015 are projected to fall to levels last registered in 2011, domestic prices move largely sideways, with only SMP projected to decline. In the medium term, nominal prices of concentrated dairy products are projected to trend continuously upwards, however only cheese is expected to increase at a rate that is greater than general inflation, resulting in a marginal increase in real terms. The price of butter, skimmed milk powder and whole milk powder is expected to increase at an average of 5.1%, 4.5% and 5.1% per year respectively, resulting in relatively constant real prices.

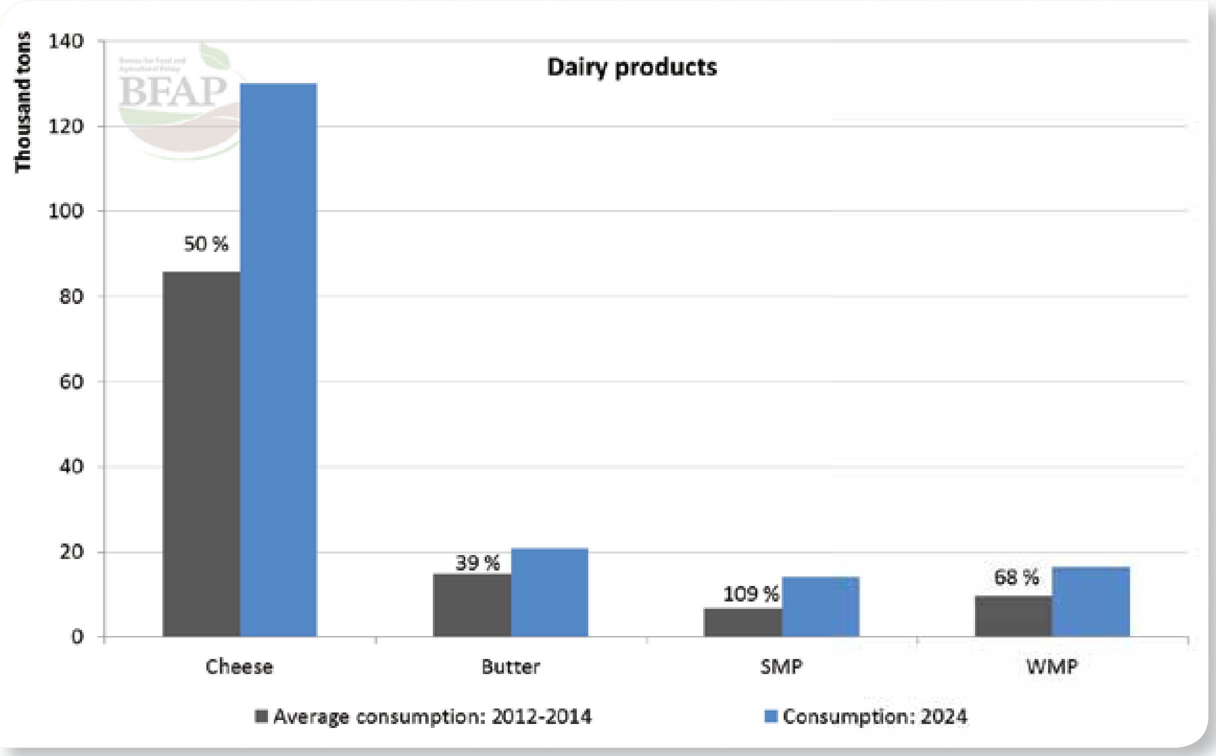


Figure 9.3: *Consumption of dairy products in South Africa*

South African Outlook

POTATOES

Apart from the short period in 2009 when the South African economy went into a recession, the demand for potatoes has increased consistently, posting an annual average growth rate of approximately 3% over the past decade.

Apart from the short period in 2009 when the South African economy went into a recession, the demand for potatoes has increased consistently, posting an annual average growth rate of approximately 3% over the past decade. It is, however, interesting to note that the area under production has not increased to match the growing demand levels and, furthermore, the area is not expected to increase drastically over the outlook period. Instead, the growth in demand has been met by rising yields. Potato growers have managed to boost yields from a national average of 34 tons per hectare on 52 thousand hectares in 2005 to 43 tons per hectare in 2015 on a marginally bigger area under production. Although yields are expected to increase, a more modest approach is followed in this baseline, where potato yields are expected to increase by 10% to reach 48 tons per hectare by 2024.

In the outlying years of the baseline, the area under production is expected to increase marginally to just over 55 thousand hectares. This will bring local production to 2.7 million tons, compared to the current level of 2.2 million tons. In other words, approximately 500 thousand tons of additional potatoes will enter the South Africa market. The rate of increase in domestic consumption over the baseline will not match the growth over the past decade due to the slower economic growth rate. Total domestic consumption is expected to reach 2.6 million tons, which implies that more or less 100 thousand tons will be available for exports. In a recent study, BFAP estimated that with a 10% increase in disposable income, the demand for potatoes will grow by 7.3%. Therefore, the economic growth rate will not only influence the total level of potato consumption, but also the split between the formal, informal and processed markets in future. Furthermore, potato consumption should be considered within the rest of the starch complex, as relative cross substitution effects do exist. Information on the demand for various starch products is provided in Box 10.1.

The projected growth in yields has a direct impact on the competitiveness of potatoes relative to alternative commodities that the farmer can produce on the same portion of land. Furthermore, the long term levels of the market prices are also

Box 10.1: Serving cost analysis of various starch products in South Africa

Dominant staple food options in South Africa

According to household-level expenditure data (StatsSA Income and Expenditure Survey 2010/11), the most popular staple food options among marginalised and lower middle income consumers (in order of importance) are maize meal, brown bread, rice, white bread and potatoes. As a group, these products represent approximately 80% to 85% of these consumers' expenditure on starchy foods.

Table 10.1: Dominant staple foods in South African according to the StatsSA Income and Expenditure Survey 2010/11

Staple food type:	Share contribution of food type to total expenditure on starchy food category:	
	Marginalised consumers:	Lower middle-income consumers:
Maize meal	30.8%	27.5%
Brown bread	23.2%	20.0%
Rice	13.2%	14.6%
White bread	9.6%	10.5%
Potatoes	8.4%	8.2%

The relative importance of staple foods in South Africa according to food expenditure data presented in Table 10.1 is confirmed by food intake data from the National Food Consumption Survey (Nel & Steyn, 2002), indicating that the most important staple food options among individuals aged 10 and older (Method 1) are maize porridge, brown bread, white bread, potato and rice (in order of importance).

Table 10.2: Dominant staple foods in South Africa according to the National Food Consumption Survey

Staple food type:	% of individuals aged 10 and older consuming the item	Average g/person/day of those consuming item	Average per capita g/person/day
Maize porridge & dishes	77.9%	848.3g	660.7g
Brown bread & rolls	55.1%	164.7g	90.8g
White bread & rolls	28.1%	161.6g	45.5g
Potato cooked	17.1%	165.1g	28.2g
Rice white/brown cooked	13.5%	163.3g	22.1g

Comparing costs per serving over time

Food affordability is a critical consideration for most consumers in South Africa. Consequently, the cost of the major staple food options must be considered from a serving (food guide unit) perspective. In this regard, serving units are based on information in the 'Guidelines for Healthy Eating' of the Department of Health. According to these guidelines

- "A portion is the amount of food that a person eats of one food at one time. Members of the same family may have different portion sizes of some foods, e.g. active men will have a bigger portion of starchy food than women. A single portion of food may have one or more units (food guide units) that are eaten at one time."
- A food guide unit within a particular food group "is calculated based on the nutritional value of the food, and this amount is then stated. Thus a single unit of each food in a food group provides a similar amount of nutrients as other units in that same group. The unit sizes of different foods are described in different ways, for example 1 slice of bread (starchy food), 1 apple (vegetables and fruit) or 1 cup of milk (milk group)."

Figure 10.1 illustrates that the most affordable staple foods are maize meal, brown bread and white bread. It is interesting to note that the serving cost of maize meal has been moving closer to the serving cost of potatoes and rice over time.

Brown bread versus Maize meal…

Comparing the serving cost of brown bread (being the second most important staple food in South Africa) with the serving cost of maize meal (grey dotted line on Figure 10.1) it is evident that a brown bread serving was around 17% more expensive than a maize meal portion during the period mid-2008 to about mid-2011. However, this ratio dropped to around 5%, thus indicating an improvement of the relative affordability of a brown bread portion relative to a maize meal serving. According to April 2015 price levels the cost of a serving of maize meal was about R0.75, compared to R1.31 for a serving of brown bread. It should be kept in mind that brown bread has a significant convenience appeal (being ready-to-eat) and thus saves energy costs and time for the consumer.

Potato versus Maize meal…

A similar trend is evident when expressing the serving cost of potatoes as a share of the serving cost of maize meal, which dropped from levels of 100% to around 50% more expensive for a potato serving relative to a maize meal serving.

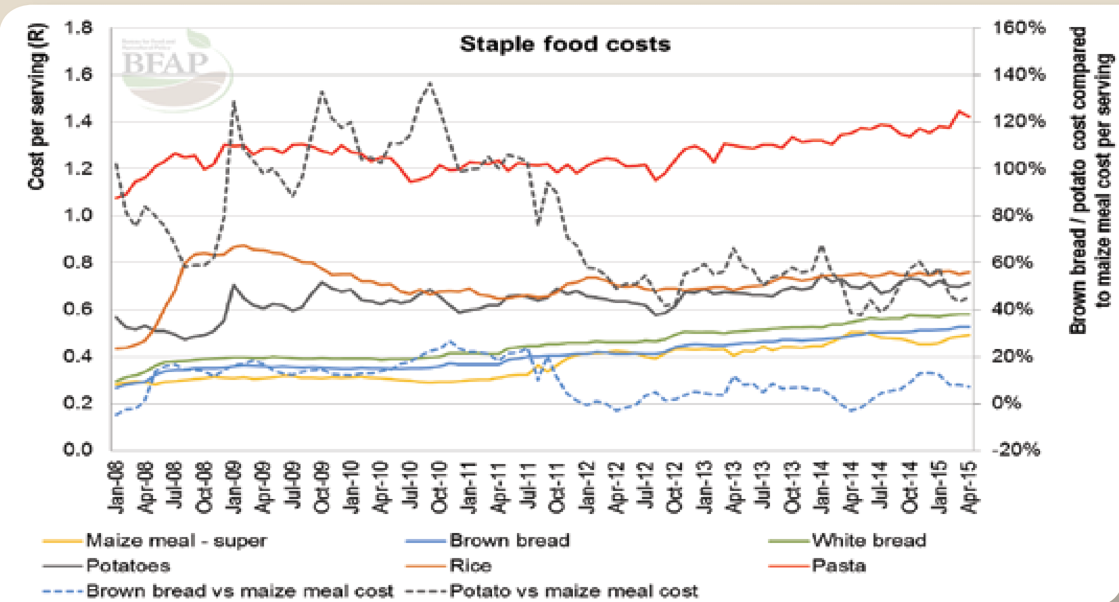


Figure 10.1: *Dominant staple foods cost per portion for the period January 2008 to April 2015*

* Acknowledgement: Co-authors for section – Prof HC Schönfeldt, Dr B Pretorius.

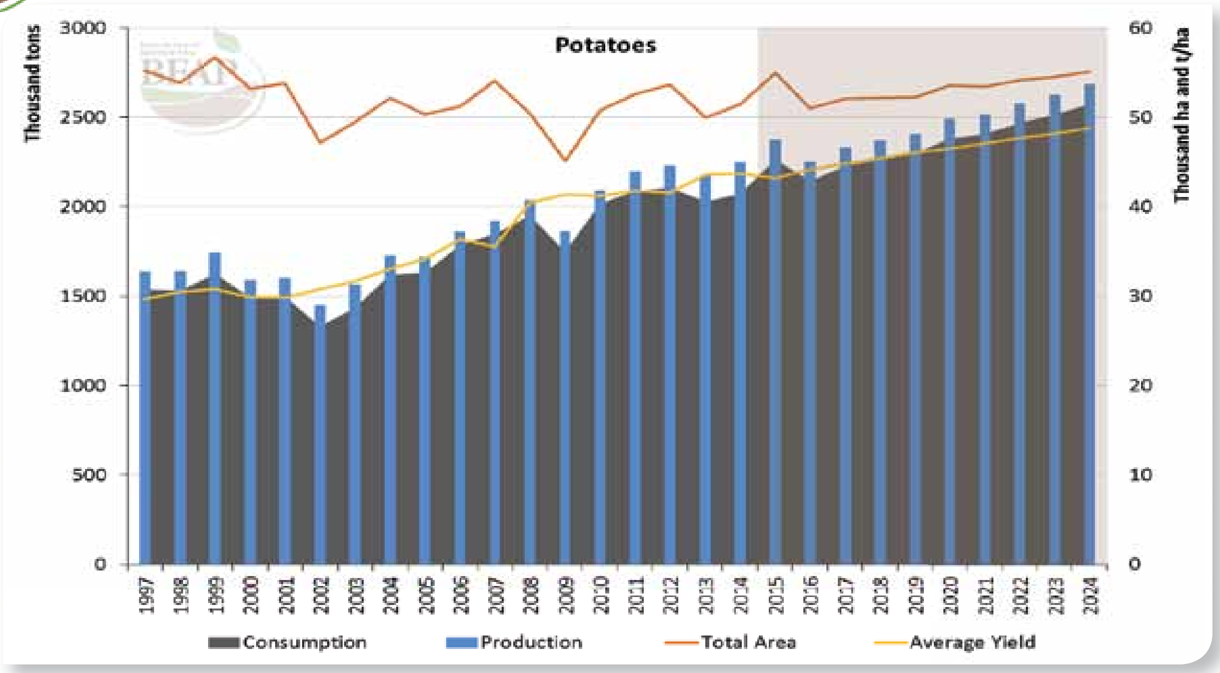


Figure 10.2: *Supply and demand in the potato market*

influenced by yield levels. With yields projecting to increase at a slower pace compared to the past decade, prices will have to increase in real terms in order to provide sufficient incentives for producers to expand the area under production that is needed to meet the growth in consumption. The potato market is finely balanced and although 55 thousand hectares does not seem to be a "physical ceiling" with respect to natural resources, it is likely that within an equilibrium approach this is an economically sustainable level, where producers receive sufficient incentive to stay in production and consumers are willing to pay the market price. Figure 10.3 portrays the relationship between the area under production and the market prices. Based on the projected decline in the area under production in 2016, market prices are projected to increase to more than R35 per 10kg bag. This represents an increase in the market price of approximately 20% from its current level. When keeping all other factors constant the BFAP model shows that an increase of 1% in production of potatoes leads to a price decrease of 3%. This relationship is, however, not linear and changes at higher or lower production and price levels. The bottom line is that profit margins vary significantly in the industry and for producers that do not benefit from economies of scale, it is a challenge to survive the typical pricing cycles.

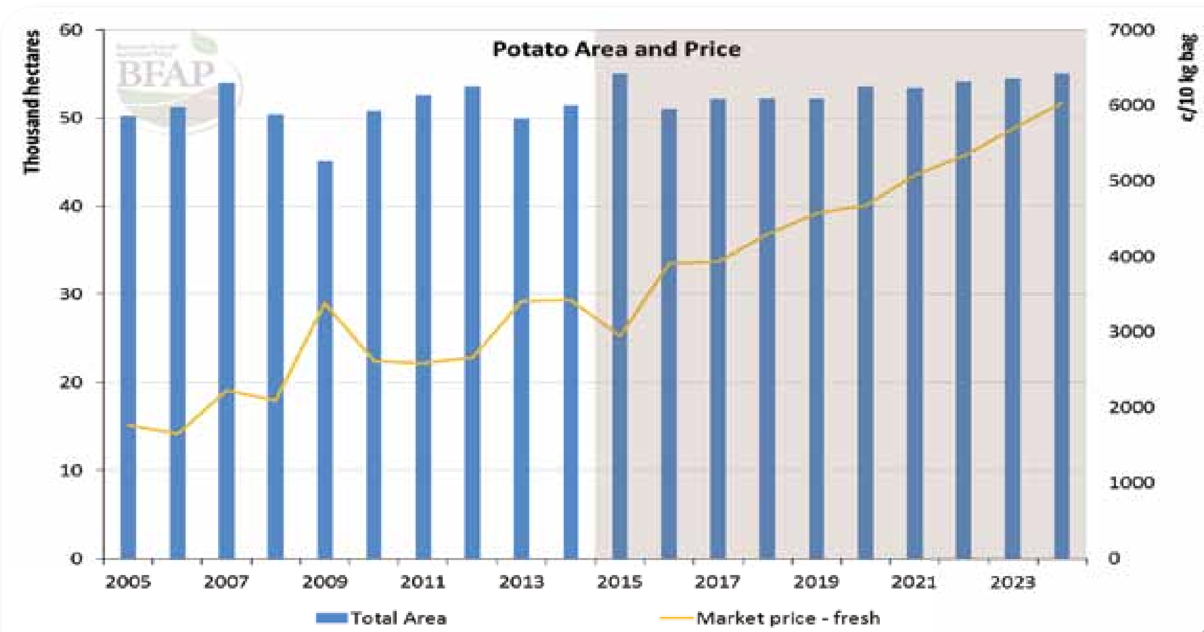


Figure 10.3: *Potato area and price*

South African Outlook
APPLES AND PEARS

The pome fruit industries in South Africa recorded a remarkable crop in 2013 which was associated with record production volumes, high prices and good quality attributes. Unfortunately, unfavourable climatic conditions in the Western Cape, particularly severe hailstorms that struck the Witzenberg area in November 2013 impacted negatively on the 2014 harvest.

Introduction

The pome fruit industries in South Africa recorded a remarkable crop in 2013 which was associated with record production volumes, high prices and good quality attributes. Unfortunately, unfavourable climatic conditions in the Western Cape, particularly severe hailstorms that struck the Witzenberg area in November 2013 impacted negatively on the 2014 harvest. Some of these production regions suffered the misfortune of further hailstorms in 2014 and the effects of these severe climatic occurrences remain evident in the 2015 harvest as bearing spores were also affected.

Pome fruit production in South Africa remains export orientated and consequently quality attributes are vitally important. In this regard, the adverse weather conditions, as well as viruses and diseases such as Fusarium on apples, resulted in fruits originally earmarked for export purposes being transferred to domestic markets and hence domestic prices came under pressure. Export markets remain well stocked and despite considerable depreciation in the value of the South African Rand, export returns are projected to increase only marginally in 2015.

Competitiveness

In light of the dependence on exports for the long run sustainability of apple and pear production, competitiveness in the global context is paramount. Application of the Relative Trade Advantage (RTA) framework, as developed by Balassa (1965) and Vollrath (1991),[10] as a proxy for competitiveness of the South African apple and pear industries over the period from 1990 - 2011 is presented in Figure 11.1. Comparatively, South Africa is outranked only by Chile within the Southern Hemisphere and vastly outperforms Northern Hemisphere counterparts such as France, Italy and Spain with regards to apples (Figure 11.1).

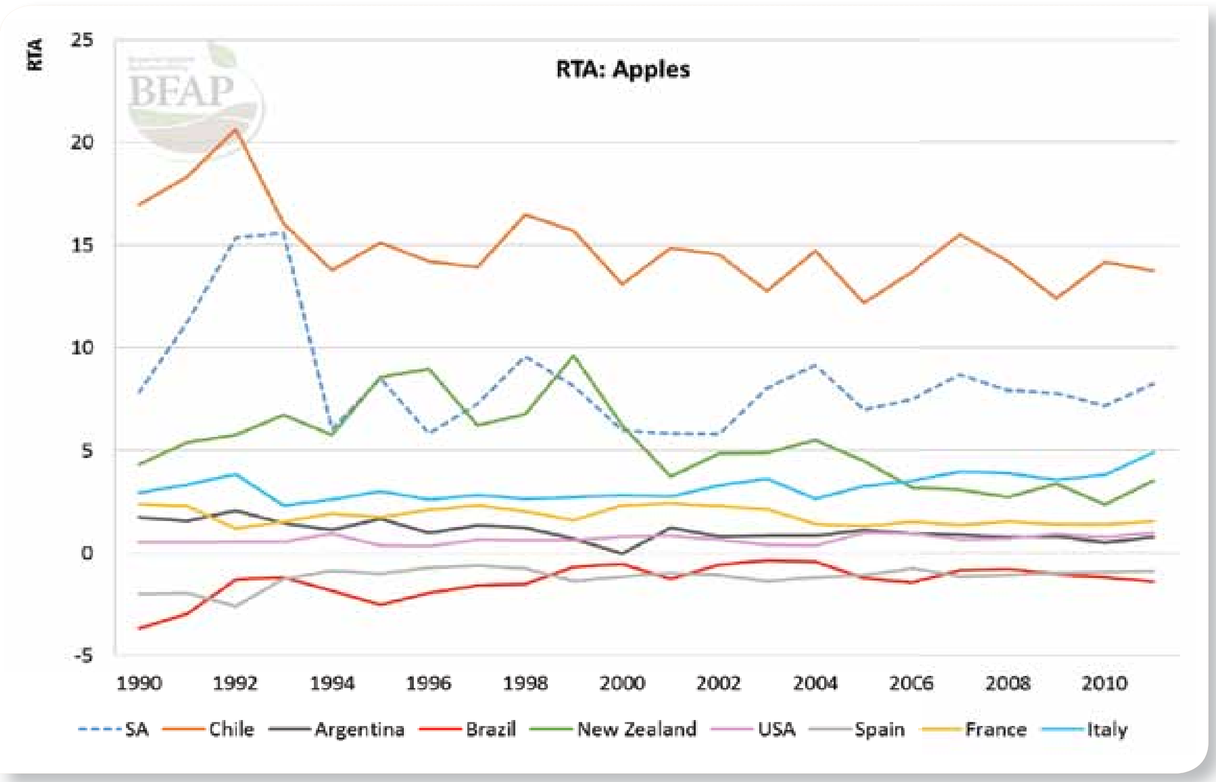


Figure 11.1: *Relative Trade Advantage of selected countries: Apples*

Source: FAO, 2014

[10] Demarcated to the availability of FAO data (FAO, 2014)

South Africa also achieves the highest RTA rating for pear production in the Southern Hemisphere, beating leading pear producing countries such as Chile and Argentina, as well as top Northern Hemisphere producers such as Spain, Italy, France and the USA (Figure 11.2).

Subsequent correlation of movements in South Africa's RTA with the movement in export volumes of apples and pears depicted in Figure 11.6 substantiates the notion of trade dependence within these industries. Furthermore, contextualisation of this RTA performance into the current stance of the pome fruit industry is important, as the diagnostics (path since deregulation, shifting towards a greater dependence on exports, market development, establishments, investments, etc.), shed some light on the prognoses of the industry's path ahead.

Production

Within the Southern Hemisphere, apple and pear production surpassed 5.2 million tons and 1.4 million tons respectively in 2014, of which South Africa contributed 15% of total apples and 27% of total pears. During the 2015 season, Southern Hemisphere production of apples and pears is projected to expand by 5% and 7% respectively, to reach 5.5 million tons for apples and 1.5 million tons for pears (WAPA, 2015).

Apple production in South Africa has exhibited a consistently upward trend since 2006 and by 2014, production levels had expanded by 41% from the 627 thousand tons produced in 2006. During this period, the apple bearing area in South Africa expanded by 11% and hence the bulk of the production increase was attributed to yield improvements. Further expansion of pome fruit area remains constrained by climatic conditions, chilling requirements and the availability of water and consequently, apple bearing areas increase only marginally over the outlook. Production is projected to sustain an upward trend, as continuous technological innovations such as improved rootstocks and scions/clones, which are proven to be more tolerant to apple viruses and diseases, drive increasing output per hectare. By 2024, apple production is projected to surpass 950 thousand tons, an expansion of approximately 16% over the 10 year period.

Pear bearing hectares are also projected to remain relatively constant over the next decade, as older orchards are merely substituted and to some extent replaced by apples. Whilst pear production has also exhibited an upward trend since 2006, expansion has been slower than apples and by 2014, pear production of 383 thousand tons was 18% above 2006 levels. By 2024, pear production is projected to surpass 420 thousand tons, reflecting an expansion of approximately 15%.

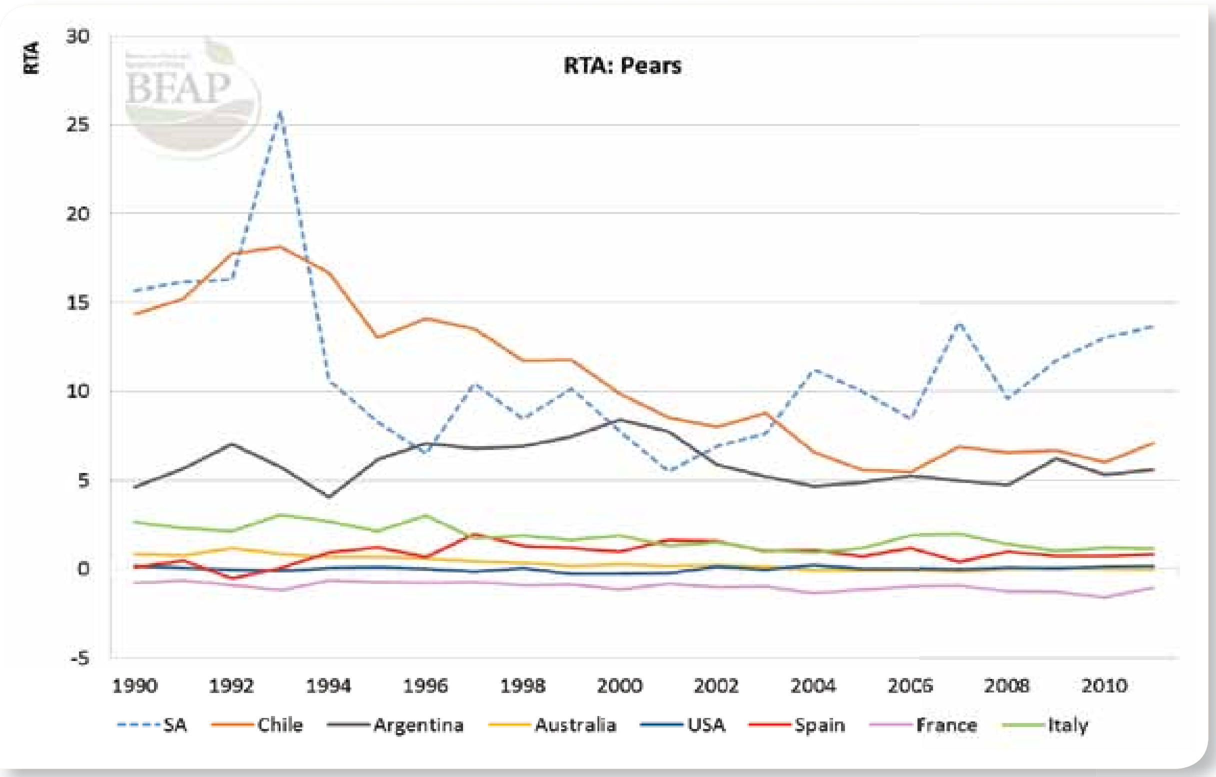


Figure 11.2: *Relative Trade Advantage of selected countries: Pears*

Source: FAO, 2014

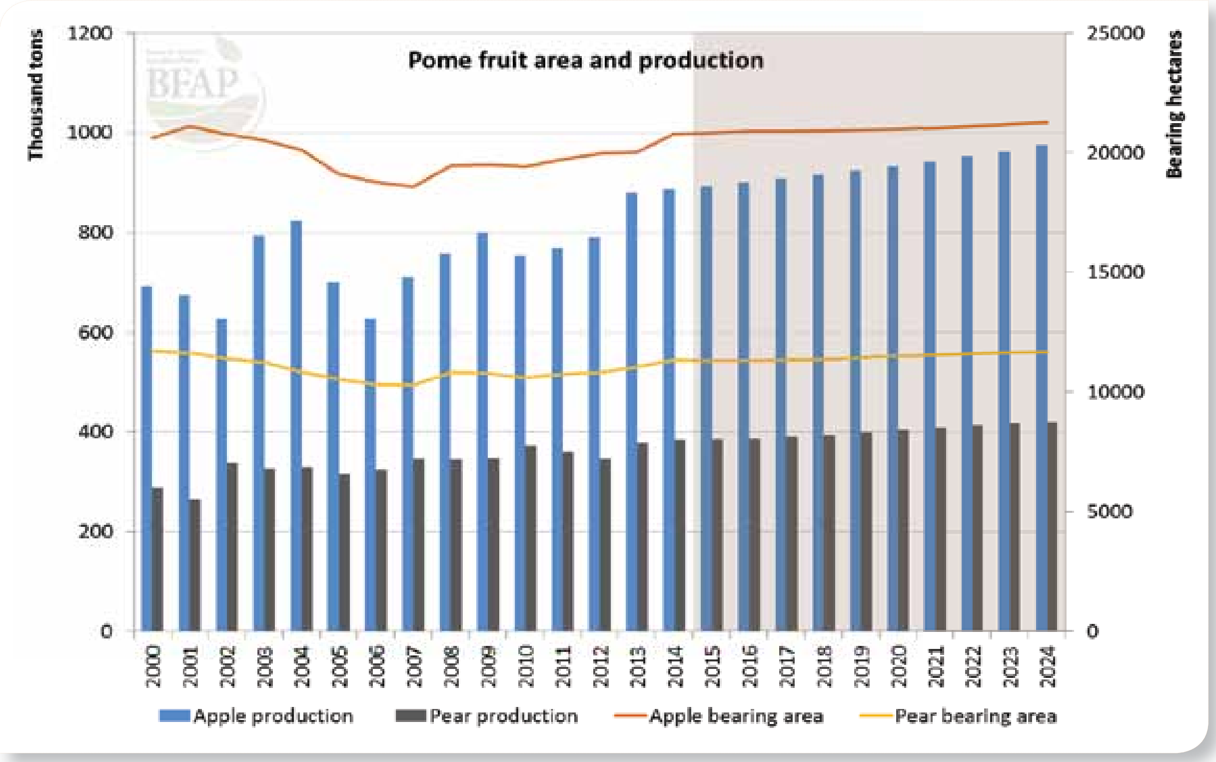


Figure 11.3: *Bearing Hectares & Total Production of South African Pome Fruit*

Marketing Distribution

Exports represent the highest value market and have consequently been the focus of apple producers over the past decade. Quality is paramount however and the impact of adverse climatic conditions is clearly evident in the production distribution of both apples and pears illustrated in Figures 11.4 and 11.5. In 2013, the share of total production entering the export market reached an all-time high at 47%, a substantial increase from 40% in 2010. This increase can be ascribed to a number of factors, including relative currency depreciation, strong import demand from Europe and the quality of the South African harvest. In 2014 however, this share plummeted to 37%, due in large to reduced quality. Over the next decade, the share of domestic production entering the export market is projected to consolidate at approximately 42%, reflecting the assumption of normal weather conditions and consequently stable fruit quality attributes.

Pear production also remains orientated to the export market, arguably even more so than in the apple industry. Historically, the share of domestic pear production entering the export market has been more stable; the share of exports in the final marketing mix has remained relatively constant around 49% of domestic production since 2010. This trend is set to continue over the next decade and while the total volume of exports is projected to increase, the share of domestic production entering the export market will be maintained at approximately 48%.

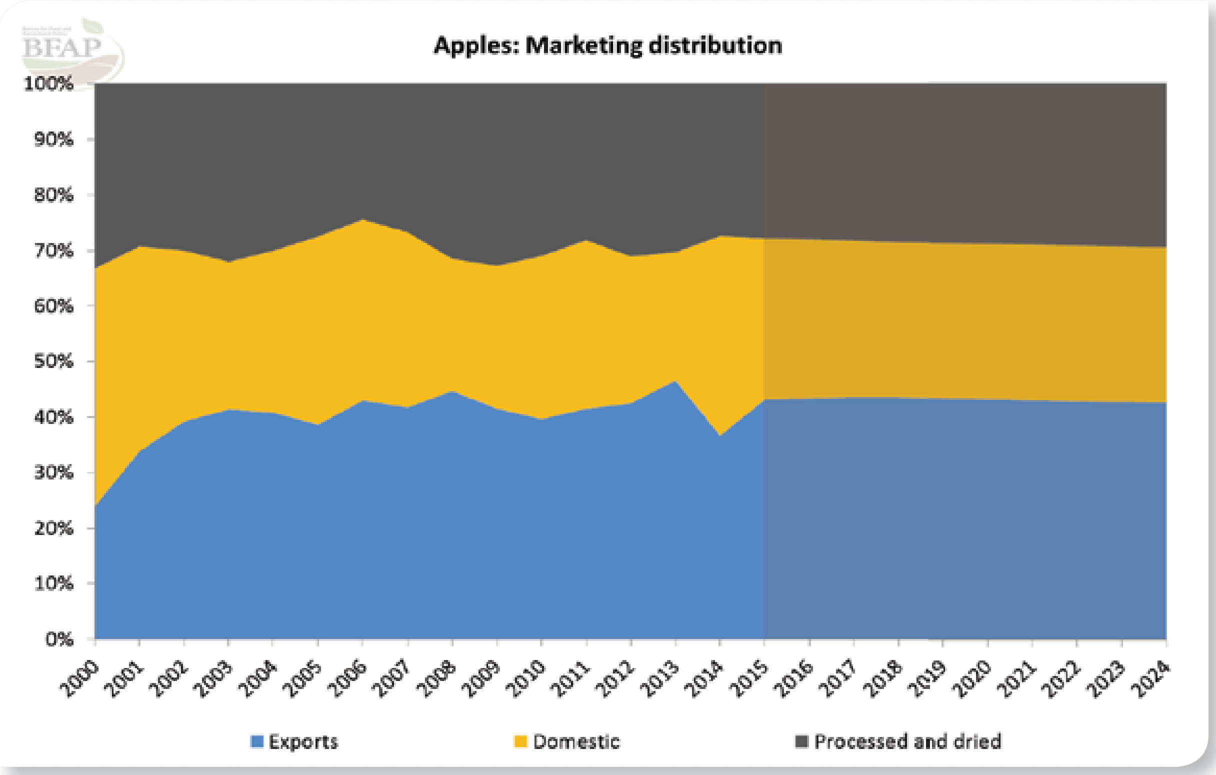


Figure 11.4: *Marketing Distribution of South African Apples*

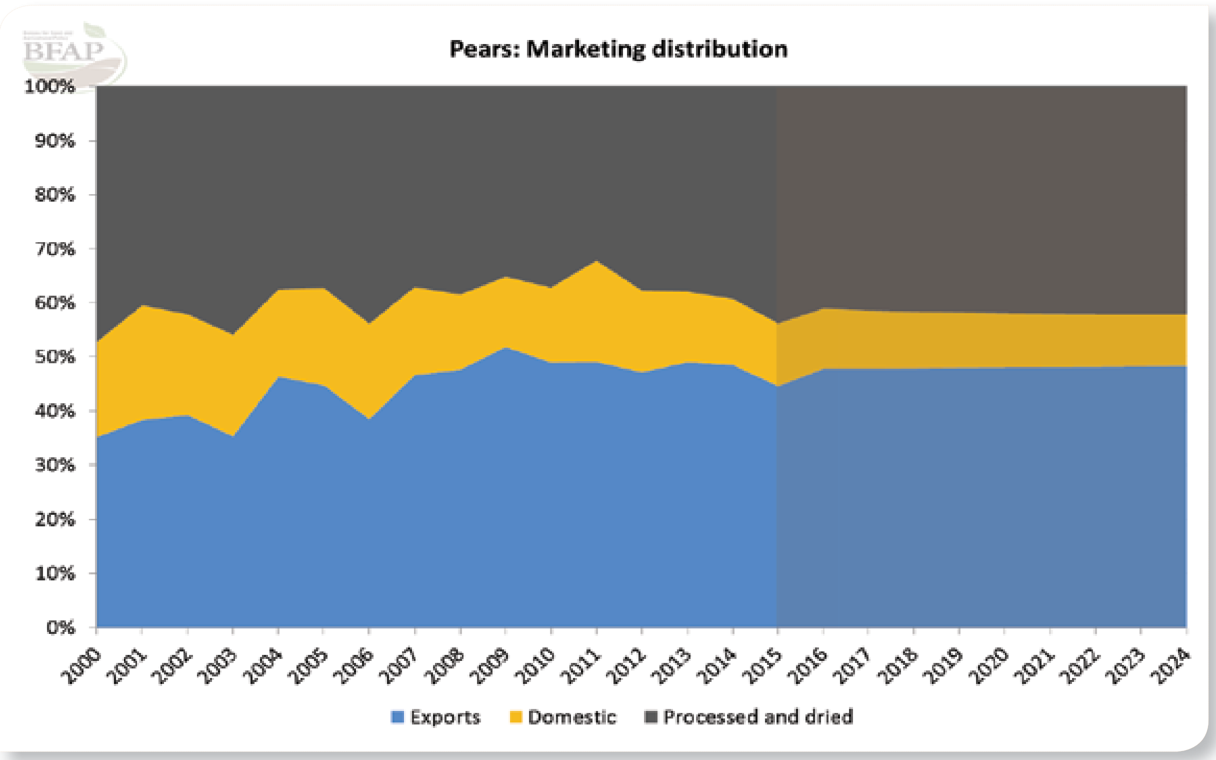


Figure 11.5: *Marketing Distribution of South African Pears*

Exports

Both producers and marketers will remember 2013 as a remarkable season, characterised by phenomenal export levels at good prices. Substantial depreciation in the value of the Rand boosted the competitiveness of high quality South African fruit in the export market, which was low on stock and exhibited firm demand. Unfortunately, a confluence of factors, including climatic conditions, fruit quality and replenished stock levels in the Northern Hemisphere resulted in apple export levels declining by more than 25% in 2014. While a recovery is projected in 2015, export volumes remain well below the levels attained in 2013, trending marginally upwards over the Outlook to approach 400 thousand tons by 2024.

The impact of the factors that drove the decline in apple exports was less severe in the pear market and export volumes maintained relatively constant levels in 2014. Pear export volumes are however projected to decline in 2015, as a result of unfavourable weather conditions, as some bearing units were damaged by hail. Over the long term, exports are projected to sustain the upward trend that has been evident over the past decade, expanding by 18% to approach 210 thousand tons by 2024.

Figure 11.7 presents the results for a Market Attractiveness Index (MAI) analysis for the exports of South African apples for the period 2010-2014, whilst the MAI for exports of South African pears over the same period is portrayed in Figure 11.8. The MAI ranks countries according to their relative attractiveness based on selected criteria from a macro-economic perspective. Countries with friendly market access conditions and high demand growth will have higher MAI values. South Africa's export growth to the specific markets is also illustrated by the yellow line, on the secondary axis of both figures.

The top three attractive apple export markets are the United Arab Emirates, Zambia and Saudi Arabia, while Mozambique, Indonesia and Qatar follow. Other notably attractive markets for South African apples are Malaysia and Singapore. South Africa is currently expanding exports into all of these markets with Nigeria, Zambia and Lesotho having the highest annual growth from 2010 to 2014. Most of the markets identified in Figure 11.7 are typically seen as non-traditional markets for South Africa, while our traditional markets such as the United Kingdom (19th), the Netherlands (37th) and the United States of America (69th) were much further down the list. This suggests that export growth in the future could likely come from non-traditional markets with higher growth expectations and more conducive market access conditions.

The top three pear export markets were identified as the United Arab Emirates, Zambia and Qatar – similar to the analyses of apples. China, Nigeria, Libya, Saudi Arabia, Indonesia and Lesotho, also present attractive export destinations for South

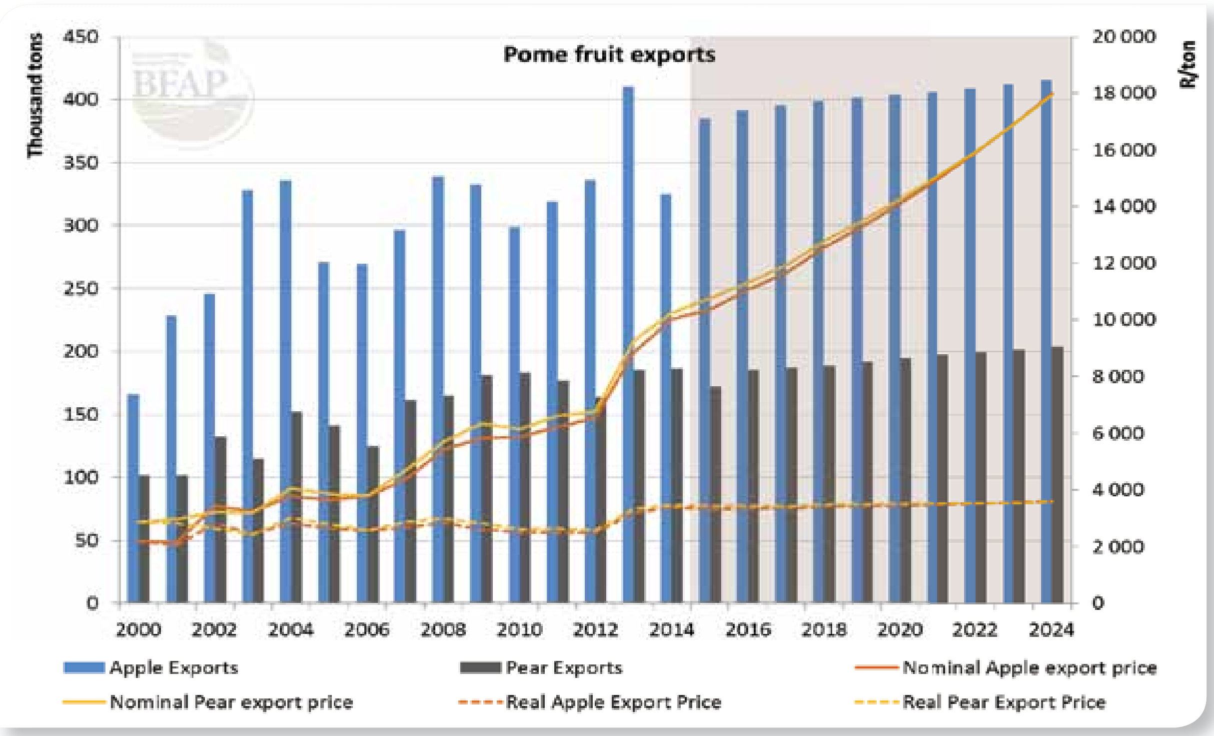


Figure 11.6: *Pome Fruit Export Volumes & Prices*

African pears. Over the period from 2010 to 2014, exports into these markets have been increasing, with Nigeria and Saudi Arabia reflecting the highest annual growth.

Of the markets listed in Figure 11.8, 26 of the 30 are classically branded as non-traditional markets for South African exports. While traditional export markets such as the United Kingdom (21st), Germany (26th), the United States of America (29th) and Italy (30th) also remain attractive markets, they feature lower down on the list. This implies that, similar to the analysis for apples, the projected export growth could likely come from these non-traditional and lucrative markets. These markets are characterised by higher growth prospects and more favourable market access conditions and as market and infrastructure developments come in line with internationally accepted standards, export prospects into these regions will continue to develop.

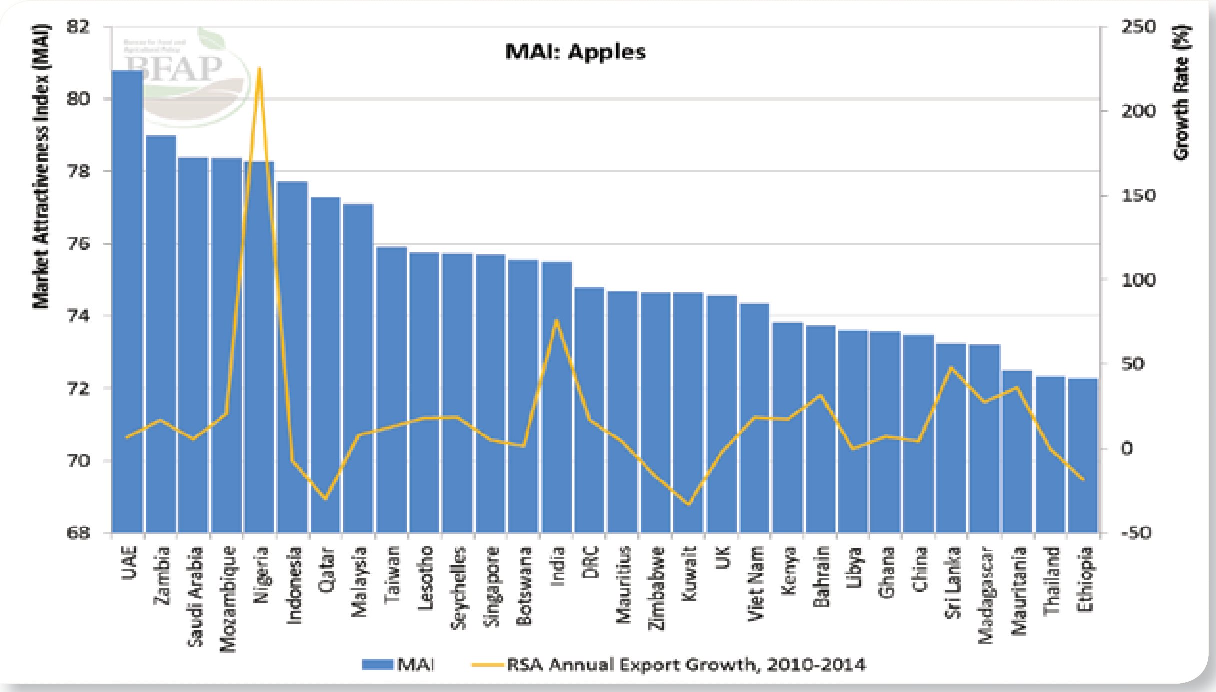


Figure 11.7: *Market attractiveness analysis for South African apple exports*

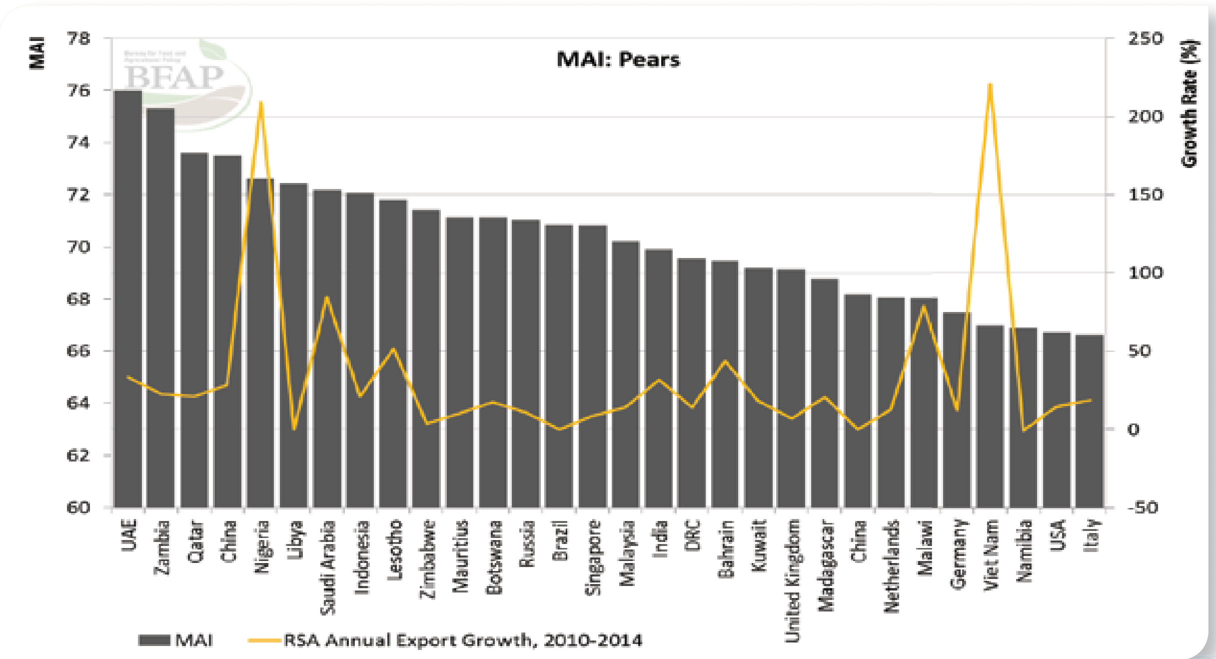


Figure 11.8: *Market attractiveness analysis for South African pear exports*

Domestic Consumption

From Figures 11.4 and 11.5 it is evident that the domestic apple market is more elastic than the pear market, as a greater quantity of produce not fit for exports can be absorbed in the domestic apple market than would be the case for pears. Quality still remains paramount and serves as an important proxy for prices. Hence in seasons such as 2013 and 2014, the negative impact of hail (2013) and Fusarium (2014) on fruit quality was evident in price levels. Over the next decade, nominal prices are projected to increase by an annual average of approximately 6.3%, resulting in an increase of less than 1% per annum in real terms once general inflation is accounted for.

Domestic apple and pear consumption has exhibited significant variability in the past, due in large to fluctuations in quantity entering the domestic market, as well as product perishability. Over the next decade, domestic apple consumption is projected to remain relatively stable on a per capita basis and consequently the bulk of domestic market expansion is attributable to population growth. Domestic pear consumption has been marginally less volatile in the past, reflecting the inelastic nature of the market and in line with historic trends, a minor decline in per capita consumption levels is projected over the next decade as a result of tastes and preferences tending to favour apples over pears (Figure 11.10).

The impact of climatic conditions in shifting produce originally destined for the export market into the domestic market has highlighted the need for the establishment of stronger domestic marketing programs. The ability of such programs to increase the quantity of produce that can be absorbed throughout the marketing season will guide the extent to which profit margins can be recovered following adverse climatic conditions.

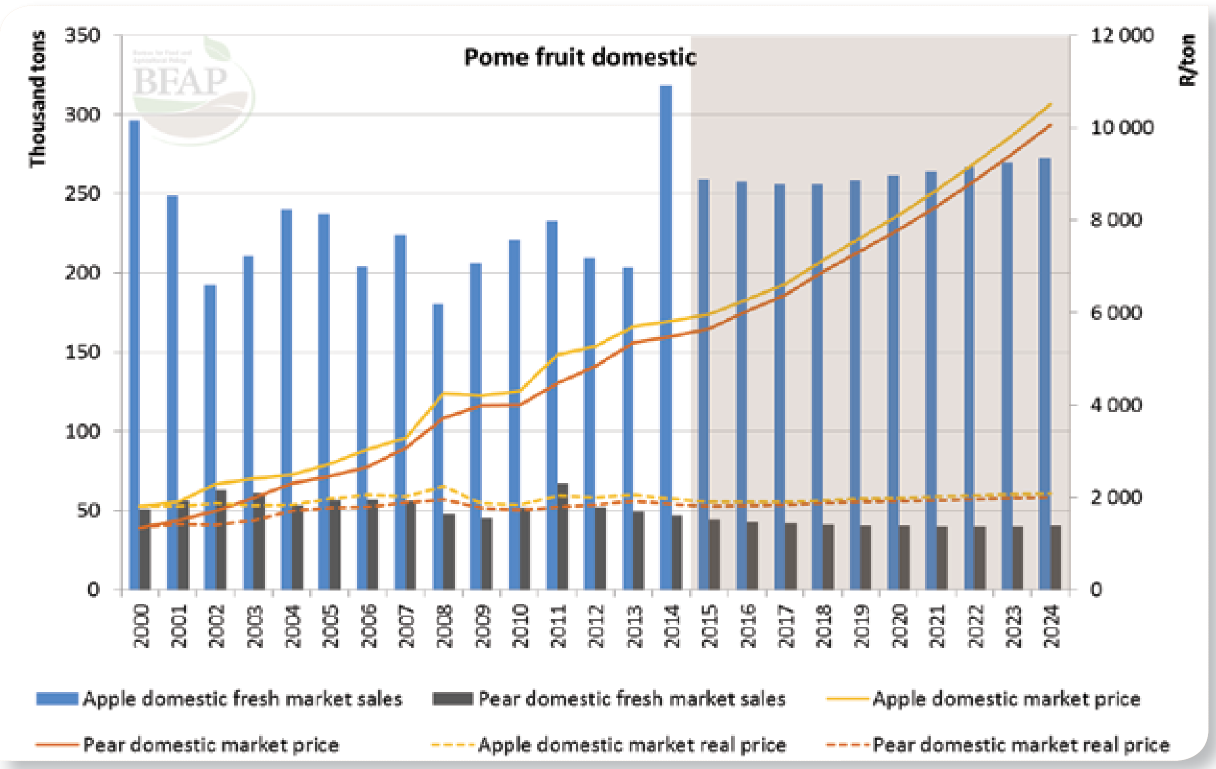


Figure 11.9: *Domestic Market Supply and Price of Apples and Pears in South Africa*

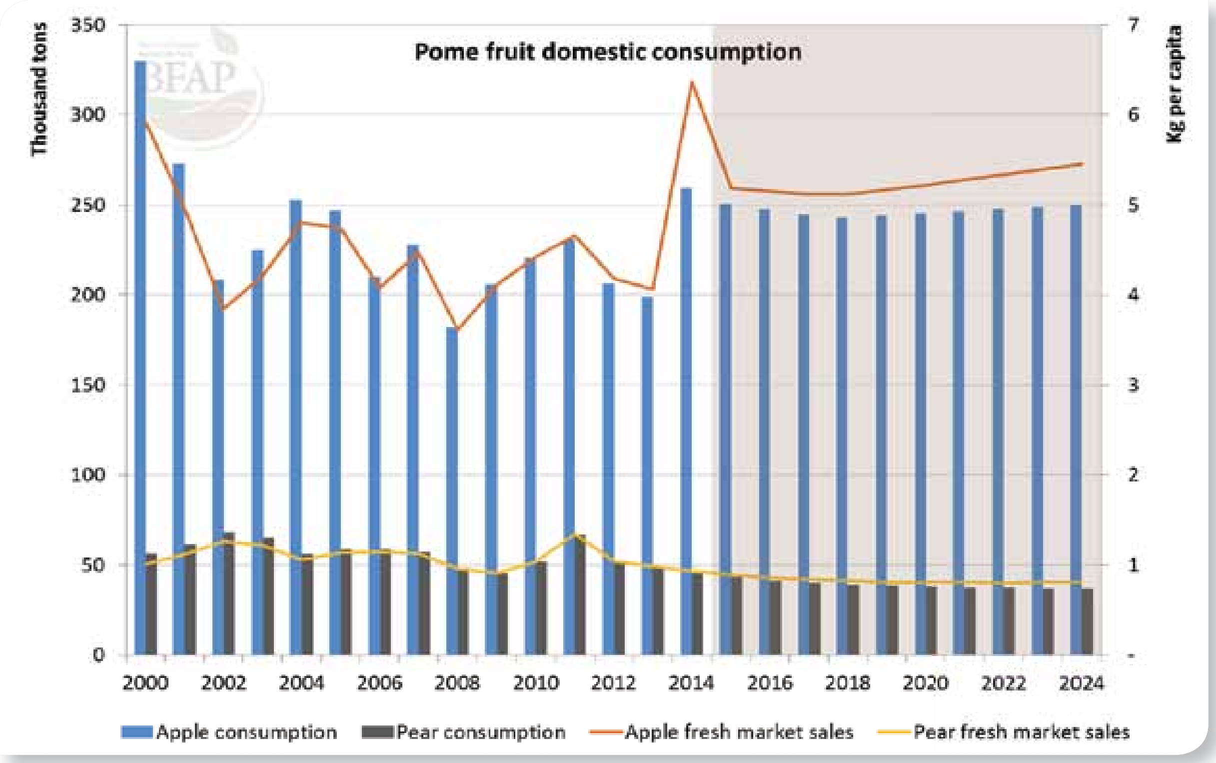


Figure 11.10: *Domestic Consumption and Sales of Apples and Pears in South Africa*

Box 11.1: The potential impact of a 'five a day' fruit and vegetable strategy on domestic apple consumption in South Africa

One of the key recommendations of the South African Food Based Dietary Guidelines is to "Eat plenty of vegetables and fruit every day" (Vorster, Badham & Venter, 2013). Scientific evidence indicates a positive association between higher vegetable and fruit intake and reducing the risk of various nutrition-related diseases and risk factors.

Some initiatives, such as the 5-a-day campaign aims to motivate consumers to eat at least five servings of fruit and vegetables per day. This translates into 500g of fruit and/or vegetables per day.

This section explores the potential impact on the South African apple industry given the potential stimulation of apple demand due to the above-mentioned guidelines.

Current apple consumption habits in South Africa

According to the Statistics South Africa Income and Expenditure Survey 2010/11 apples dominate the fruit expenditure of all socio-economic subgroups within the South African population, with expenditure on apples contributing 19% to 33% of total fruit expenditure. Nel and Steyn (2002) further indicate that according to the National Food Consumption Survey (NFCS), the intake of fresh apples is:

- Consumed by 8.1% of children aged 1 to 5; 132 gram/person/day for those consuming apples; Overall per capita consumption of 11 gram/person/day.

- Consumed by 7.2% of children aged 6 to 9; 160 gram/person/day for those consuming apples; Overall per capita consumption of 12 gram/person/day.
- Consumed by 5.7% of individuals aged 10 and older; 209 gram/person/day for those consuming apples; Overall per capita consumption of 12 gram/person/day.

Estimated per capita consumption of apples according to the Abstract of Agricultural Statistics (2014) is about 10.9 gram/person/day, being in line with the per capita figures of the NFCS mentioned above. Thus, despite being a dominant fruit type in South Africa, indications are that less than 10% of the population consume apples.

What if at least 50% of the population can consume an apple twice a week?

If 50% of the South African population could consume a 100g apple portion twice per week, their total consumption could amount to about 281 thousand tonnes, representing about a third of the 2014 production in South Africa. Limited food budgets impose a significant limitation on poorer households' ability to afford a diverse diet with adequate fruit and vegetables. One vehicle through which increased apple consumption may possibly be achieved could be through the inclusion of apples in school feeding programs, as about 9 million children benefitted from school feeding in 2013/2014. Thus, if 9 million children can consume two apples a week through school feeding the additional demand could amount to 97 thousand tonnes or about 11% of the 2014 production in South Africa.

Increased apple consumption (as part of a total 500g daily composite portion of fruit and vegetables) could contribute to dietary diversity and the nutritional intake of consumers. Examples of nutritional 'selling points' of an apple include the following:

- Contains phyto-nutrients (flavonoids and polyphenolics), and anti-oxidants contributing to optimal growth, development, and overall wellness.
- Low in Kilojoules.
- Rich in dietary fibre.
- Contains other micro-nutrients such as vitamin C, B-complex vitamins and some minerals such as potassium, phosphorus, and calcium.

South African Outlook

WINEGRAPES AND WINE

The South African wine industry underwent substantial changes since the 1990s following the removal of sanctions, deregulation of agricultural marketing and liberalisation of trade. These policy shifts transformed the domestic industry in a relatively short timeframe and the same forces continue to shape the industry.

Introduction

The South African wine industry underwent substantial changes since the 1990s following the removal of sanctions, deregulation of agricultural marketing and liberalisation of trade. These policy shifts transformed the domestic industry in a relatively short timeframe and the same forces continue to shape the industry. The generation of an outlook therefore has to be contextualised within these historic trends, due to their continued relevance, particularly for a long term crop such as vines.

As an export orientated industry, the measurement of its ability to trade, as a proxy for competitiveness, provides a good summary of the structural shifts and the resulting effects thereof. This can be analysed through the calculation of the sector's Relative Trade Advantage (RTA), which is presented in Figure 12.1.

Van Rooyen, Esterhuizen and Stroebel (2011) analysed the transformation in the competitiveness of the sector according to five distinct phases: Phase 0 is the pre-1990 era, representing the period of regulation and central control with limited access to markets during the 1980s. Phase 1 "The Madiba Magic Period (1990-1995)" was characterised by political liberation, the lifting of sanctions and greater access to international markets, as reflected in the increase of the industry's competitiveness. Newly gained access to the international markets however also increased exposure to international competition as reflected in the subsequent decline in competitiveness. This second phase of "facing competitive realities" (1996-99) was characterised by the removal of the agricultural marketing boards and increased competition from Australian wines within the UK market. The industry also had to adapt to changing international preferences such as the desire for "new world" fruity "non-grassy" white wines and better quality red wines.

In Phase 3 (2000-2005) the sector transitioned "towards becoming a global player" through the implementation of various strategic plans, including the Vision 2020 and the Wine Industry Plan (WIP) of 2003. Arguably these efforts paid off given the significant increase in exports to the UK, Netherlands and Germany. This period accounts for the lion's share of the increase in red wine production, with the share of red vines planted increasing from 15% to more than 40% (Figure 12.2.).

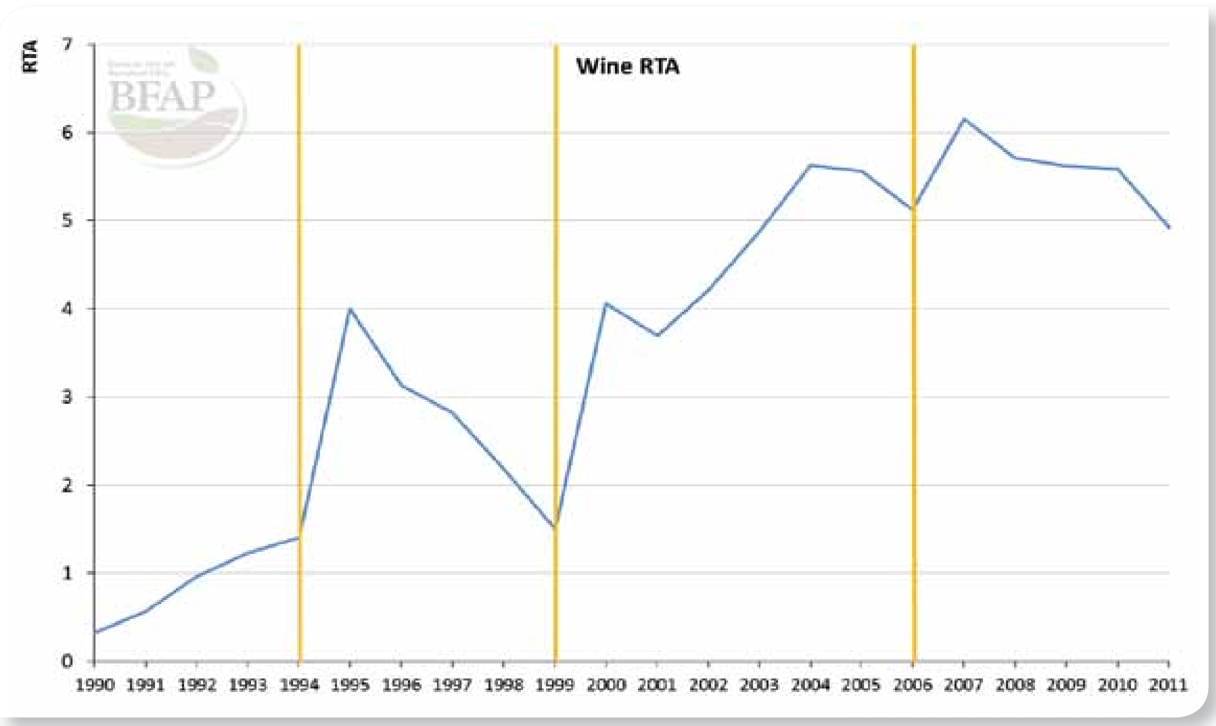


Figure 12.1: *Competitive performance of the SA Wine industry 1990 - 2011*
Source: Van Rooyen, Esterhuizen & Stroebel, 2011

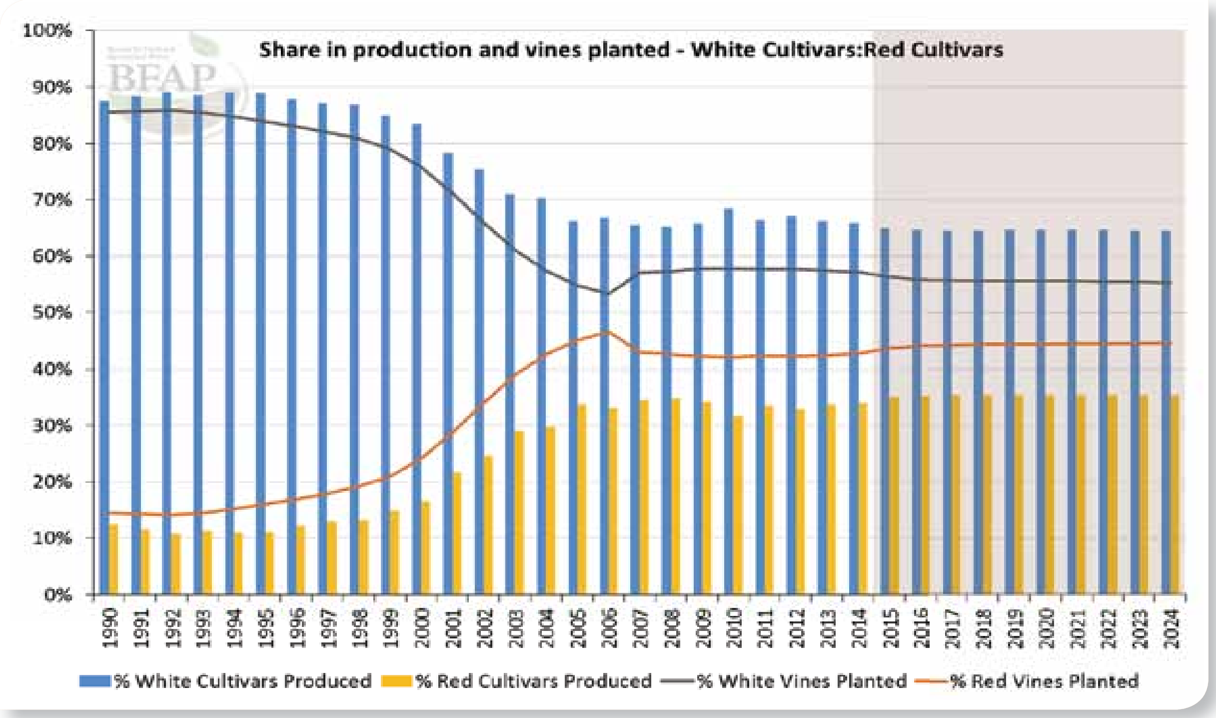


Figure 12.2: *Relationship - White cultivar vines: Red cultivar vines (Production and Vines Planted)*
Source: SAWIS, 2015

Since 2006 the sector has transitioned to Phase 4 characterised by "operating in a constrained competitive environment" as reflected in the gradual decline in the sector's competitive performance. This is partially driven by the slowdown in the world economy and the resulting decline in consumption and partly by the strong rise of Chile and Argentina. Although the FAO data used to calculate the RTA ends in 2011, the more recent export performance of the industry is evidence that the decline in the first part of Phase 4 has now been turned around.

This chapter provides the first wine outlook since 2010 with the primary aim of shedding more light on these trends in competitiveness and to provide a perspective on what is to be expected over the next ten years.

Production

The total number of red vines increased dramatically from 32 million vines in the mid-1990s, reaching 85 million by 2003 and eventually stabilising at around a 125 million by 2007 in response to the reduction in the red to white premium as shown in Figure 12.7. Total production increased from 1.23 million tons in 2003 to an all-time high of 1.52 million tons in 2014 following favourable weather conditions. The production of natural, fortified and sparkling wine has expanded by 35% between 2006 and 2014, thereby increasing its share in total production from 70% to 81% (Figure 12.3). During this period, grape juice and grape juice concentrates posted the greatest decline of 52% whilst wine for brandy and wine for distilling purposes posted a decline of 35% and 10% respectively. Going forward towards 2024 the outlook for total production volumes is cautious however, showing an increase of only 1% whilst the production of the other categories is expected to continue their decline with wine for brandy leading the pack at 34%. This outlook is primarily driven by relative prices and the current state of replanting.

Most vines are currently between 8 and 15 years old (Figure 12.4), with the percentage share of vines older than 16 years increasing from 26.2% of the total in 2008, to 32.5% by 2014 (SAWIS, 2015). The trend of aging vines is expected to continue going forward due to the growing number of vines that reach their replacement age, following the accelerated planting since 2000. Given the current state of profitability levels, non-niche vines cannot be replaced and hence producers are faced with the decision of switching to alternative crops or trying to extend the life of bearing vines as far as possible. This is most prevalent in the colder production areas given the shorter lifespan of their vines and lower production volumes. Over the short term, the impact of this trend should not be overestimated, given the fact that most production takes place in the Breedekloof, Olifants River and Orange River regions, but this scenario could play out over the long term in these regions as well if current price trends continue (Vinpro, 2015).

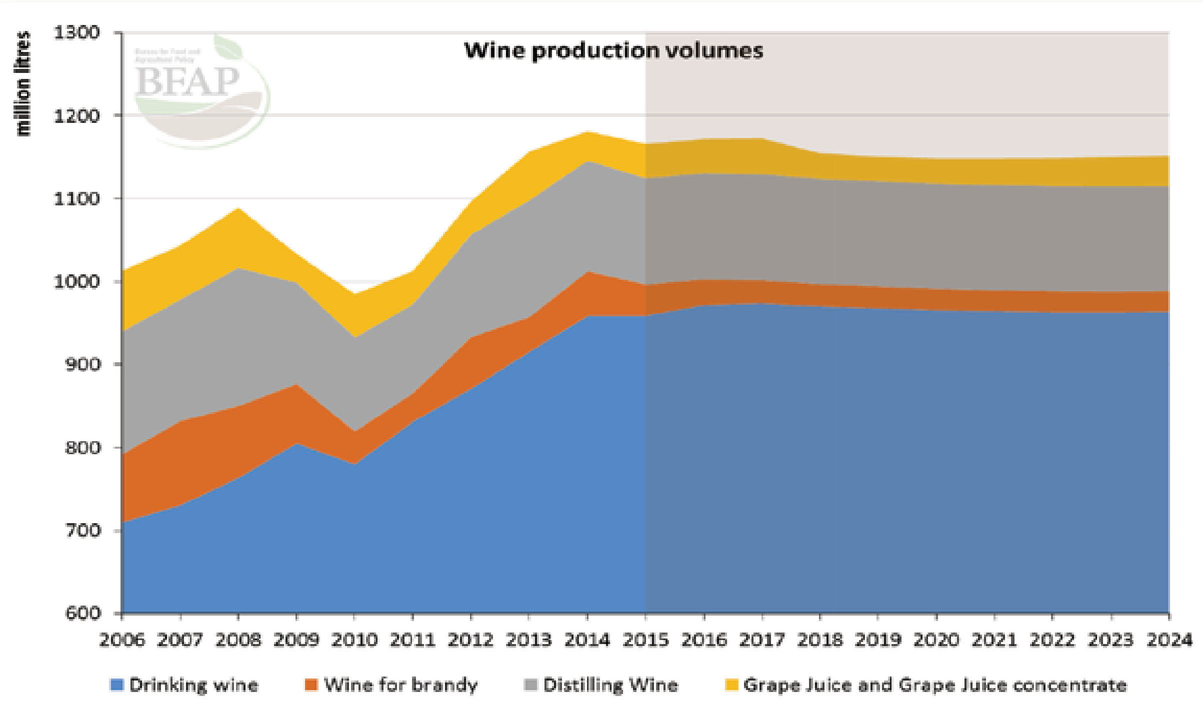


Figure 12.3: *Historic and projected production volumes of grape products*

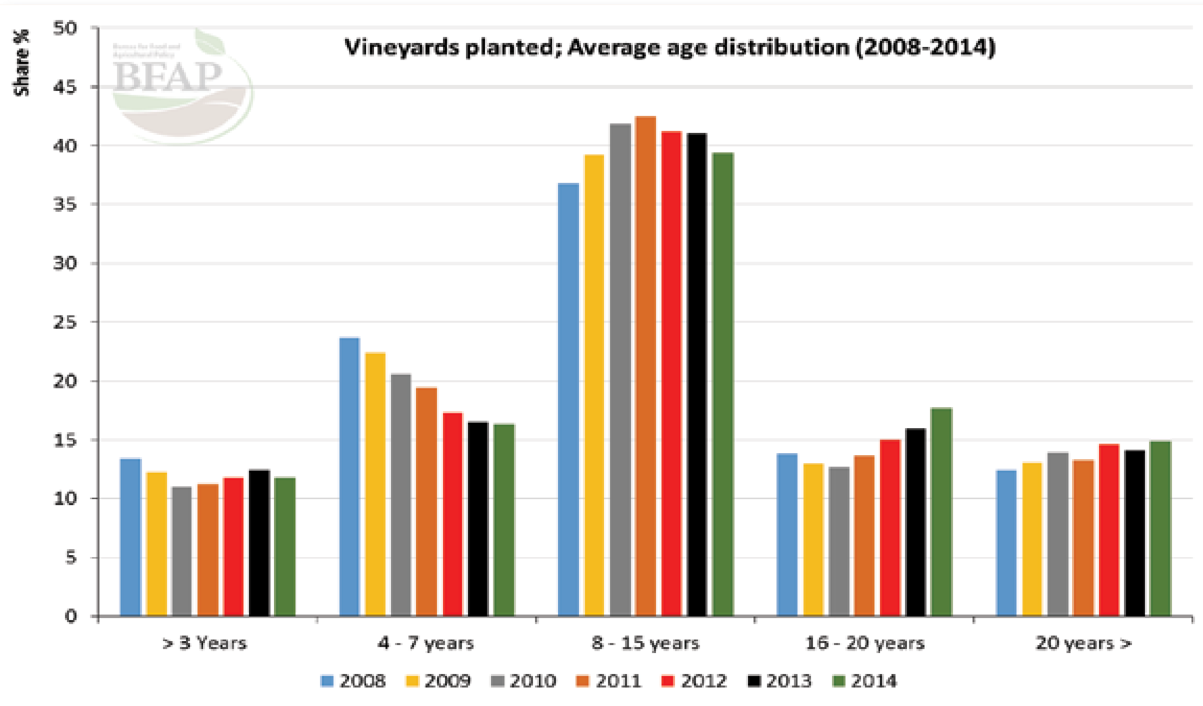


Figure 12.4: *Average Age distribution of Vines Planted (2008 - 2014):*
Source: SAWIS, 2015

Trade

Wine export volumes continued to grow from the 238.46 million litres in 2003 to a record 525.58 million litres in 2013. In light of the below average European harvest, export volumes attained in 2013 were exceptional, particularly into Southern European markets. Europe continues to serve as the most important export destination with the United Kingdom leading the pack, but it is being superseded by the combined volumes to Germany and the Netherlands in recent years (Figure 12.5). Volumes to the North-American[11] market have increased since 2006 but less spectacularly than exports to BRIC's and Africa. In 2014 Russia received 74% of BRICs exports, whilst the three main Africa trading partners; Angola 21%, Kenya (14%) and Nigeria (13%) imported the greatest share of South African exports into the region (Figure12.6).

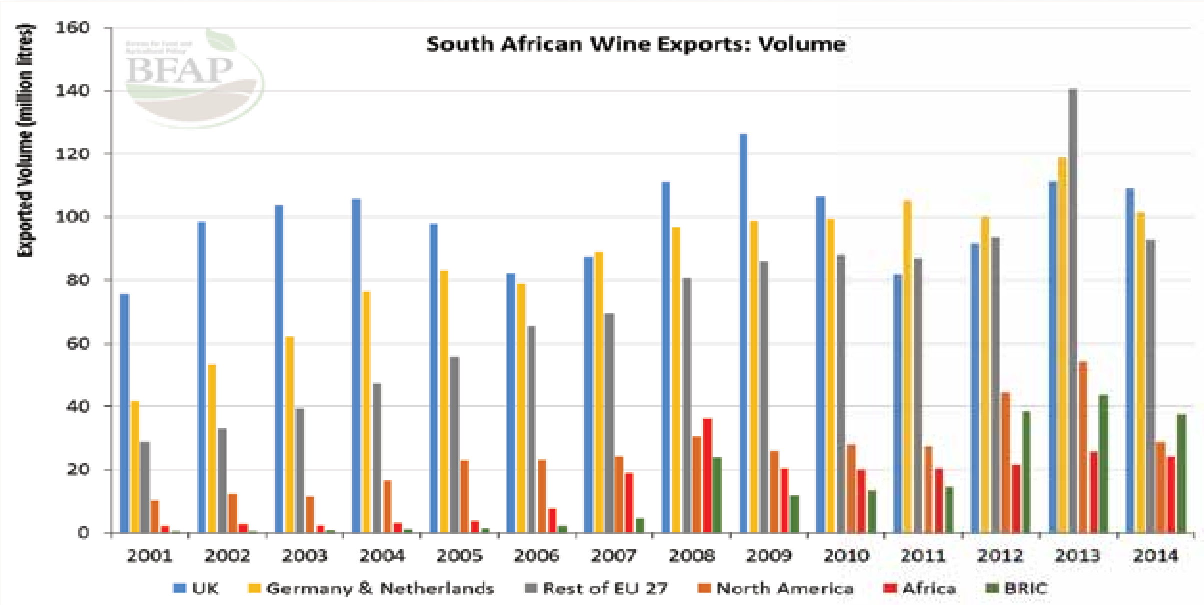


Figure 12.5: *Destination of South African exports: 2001-2014*
Source: SAWIS

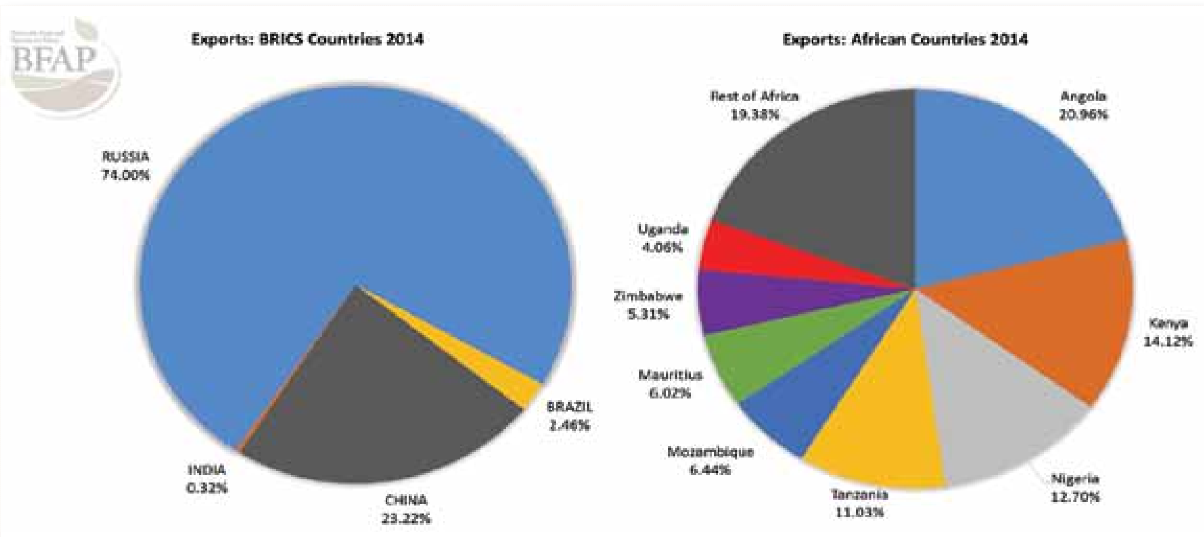


Figure 12.6: *South African Wine Exports: Share of BRIC and African countries*
Source: SAWIS

11 USA & Canada

Going forward, the outlook for exports remains positive given the continued value proposition of South African wines in Europe, the relative strength of the US Dollar and the possibility of continued export growth into the African and Russian markets. This will drive the projected increase in good wine production at the expense of the other categories. It has to be noted that this outlook is subject to a number of uncertainties, including the impact of the downturn in the oil market on exports to Russia and a number of prominent African destinations.

Price trends for grapes and wine

The premium obtained for red wine drove the substantial increase in red vines planted but this premium has decline in response to increased volumes (Figure 12.7). Going forward real red wine prices are projected to show a decrease over the short term due to relatively high stock levels but real prices will recover somewhat over the medium term. The outlook for real white wine and juices reflects a marginal decline towards 2024, whilst the real price of wine for brandy remains relatively stable.

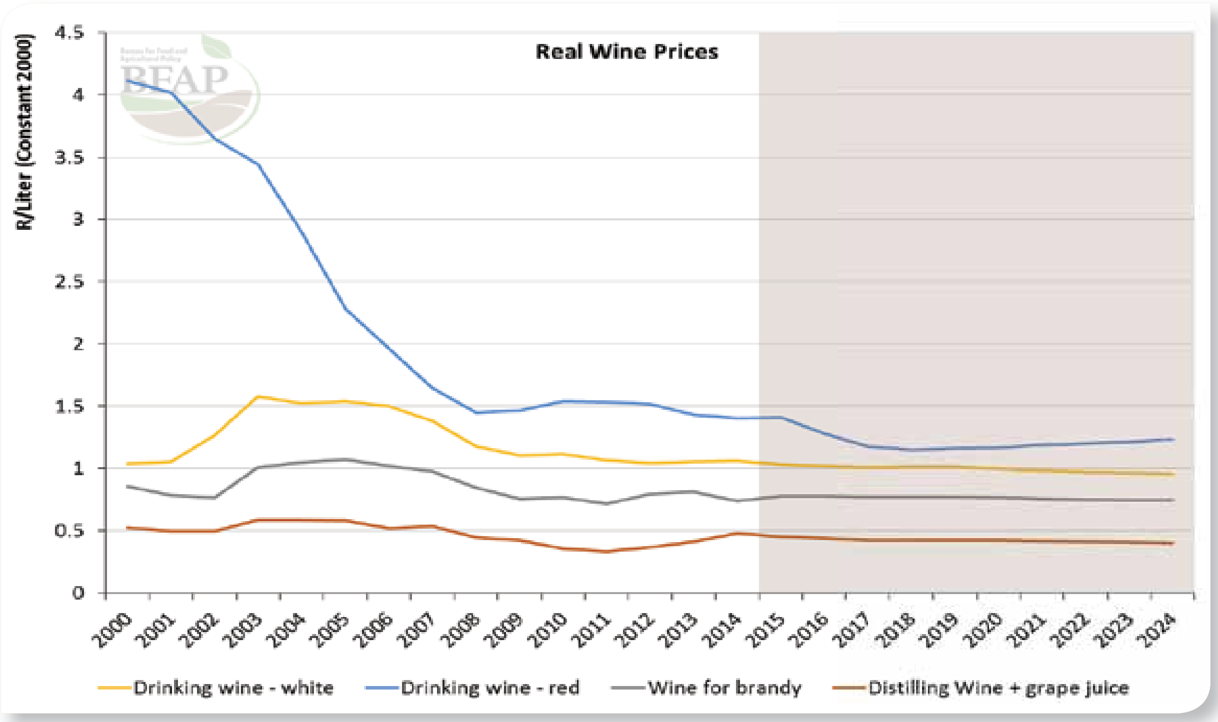


Figure 12.7: *Historic and projected real (2000) wine prices*
Source: SAWIS, 2015 & BFAP

South African Outlook

FARMING SYSTEMS ANALYSIS

.....the combination of crops grown, the number of times and depth of cultivation, the time of planting, watering, and harvesting, the combination of hand tools, ditches to carry water to the fields, draft animals and simple equipment -- are all made with a fine regard for marginal costs..... Theodore W. Schultz, 1964

Introduction

The agricultural environment, both globally and in South Africa, was characterized by considerable volatility in the past production season, making it difficult to stick to Schultz' precepts. Macro-economic movements and their respective impacts on commodity price fluctuations, as well as the cost of key inputs, severe weather conditions and political and policy influence in agricultural markets have yet again made economically rational decision-making an exceptionally challenging task.

Since January 2013, the Rand has depreciated by 37% against the US dollar, supporting commodity prices, particularly in sectors where South Africa is in a net importing position, but also creating cost implications on the inputs side. While the cost Brent crude oil plummeted from US$112/barrel in January 2013 to below US$50 in January 2015, the domestic impact was negated to some extent by the depreciation in the Rand, as well as the application of additional fuel levies. Similarly, the generally declining trend in the international fertilizer market since 2011 has not been evident in domestic markets, which moved largely sideways and at times even upwards over the same period.

Apart from the increasing cost of inputs, the summer grain area in 2015 experienced exceptionally challenging weather conditions, causing yields to fall to decade lows. The 5th production forecast by the Crop Estimated Committee (CEC) estimated the national average maize yield at only 3.67 tons per hectare in 2015, 44% below the 5.3 tons per hectare recorded in 2014. The greatest impact is in the Free State and North West provinces, where the drop in yields ranged from 63% and 85% from 2014 levels.

The above mentioned drivers and their associated volatility have a significant impact on the financial output and long term sustainability of South African producers, both small-scale and commercial. Managing volatility in both inputs and outputs is a complex task, yet awareness of the environment in which producers operate is important in formulating strategies that could shape the long term sustainability of primary agricultural production. This section focuses on the performance of South African producers in the past season (2013/14), their respective position in a global competitive space and the implication of the baseline projections on their financial position over the outlook. A stochastic analysis is employed in the North West and the Free State, presenting a range of possible outcomes that reflect some of the risks and uncertainties faced by producers in the region.

The BFAP Farm-level program and methodology

The farming systems program was established with the main objective of assisting agri- and farm businesses with strategic decision-making under changing and uncertain market conditions. Prototype farms across South Africa's key producing regions are constructed according to a standard operating procedure and linked strategically into the BFAP system of integrated models, allowing quantification of the impact of different policy options, macroeconomic variables, and volatile commodity market conditions on the financial position of farm businesses in key production regions in South Africa. Figures, data and production statistics illustrated in this chapter do not reflect provincial averages, but rather average values for the specific regions where the prototype farms are situated. Production statistics within these regions are as representative as possible given the information and resources available. The BFAP farm level program employs two different quantitative tools; the farm level financial simulation (FinSim) model capable of simulating a prototype farm financially and demonstrating the implication of sector level projections at farm-level, as well as the agri benchmark international network of representative farms to benchmark production systems across the globe. These tools are applied to both commercial and small scale producers.

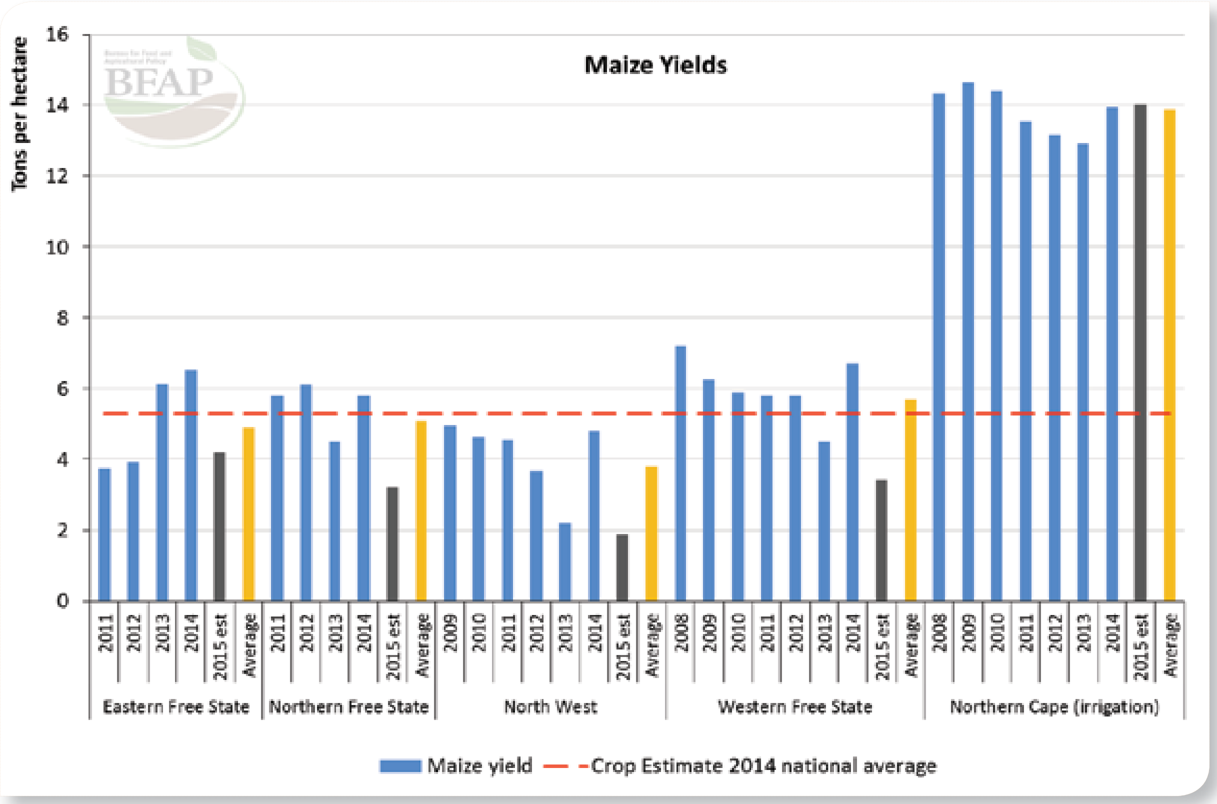


Figure 13.1: *Trends in maize yields: 2009-2014*

Can South African crop farmers compete in the global context?

The 2013/14 production season was exceptional, with maize yields exceeding the respective long term averages in most regions (Figure 13.1). Particularly the eastern Free State (6.53 tons per hectare) and the western Free State (6.70 tons per hectare) performed exceptionally well, whilst Northern Cape maize cultivated under irrigation reached almost 14 tons per hectare. However, estimated levels decline significantly for the 2014/15 production season, due to the widespread droughts in the summer grain producing region, particularly in the North West province (yield estimates below 2 tons per hectare) and in northern- and western Free State (yield levels between 3 and 4 tons per hectare).

Wheat also performed well, with the eastern Free State and Overberg regions obtaining above-average yields. Barley yields in the Overberg region remained strong for the fourth successive year mainly due to ideal rainfall conditions, while yields obtained from irrigated wheat in the Prieska region dropped below the long term average due to very hot climate during the period of pollination (Figure 13.2).

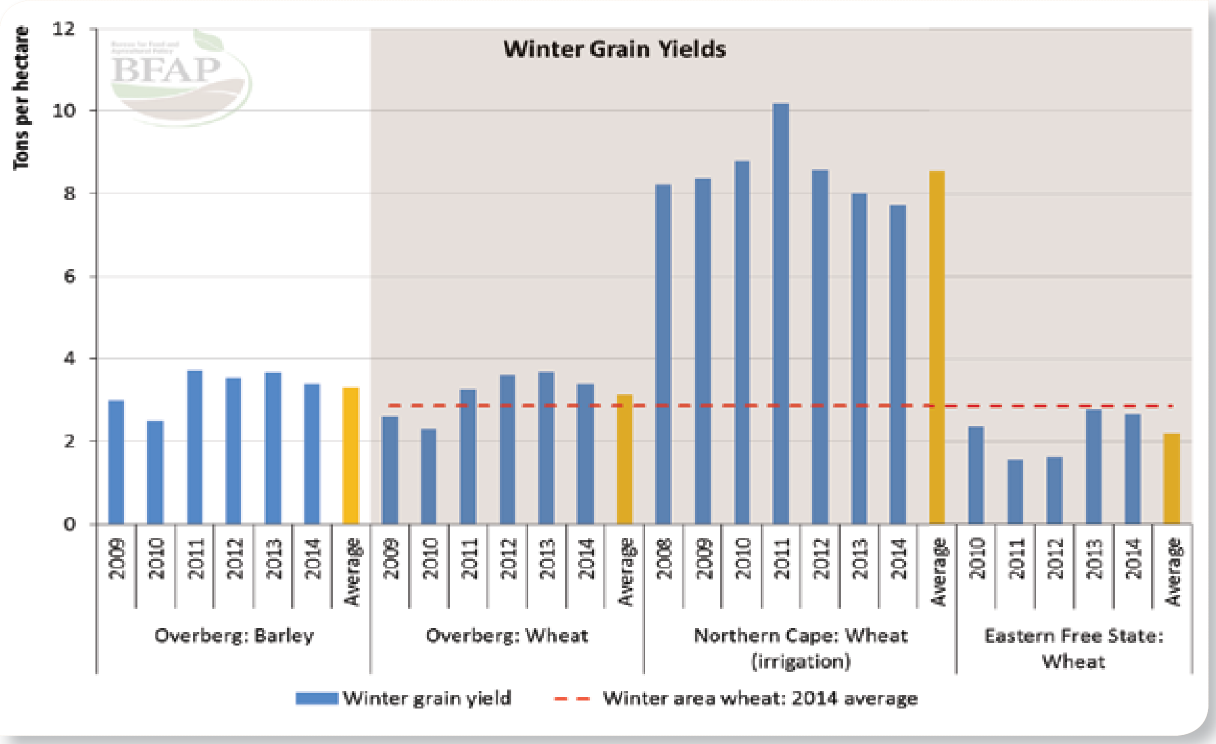


Figure 13.2: *Trends in wheat and barley yields: 2009-2014*

Table 13.1 provides the summary statistics for each key growing region, highlighting the direct cost of production, the respective yields, farm gate prices obtained, the cost of producing one ton of produce and the break-even yield for the 2013/14 season. The gross margin performance based on the table outcomes is presented in Figure 13.3 and is categorized according to performance in the particular season where the lowest margins are presented on the left and the highest to the right of the graph.

Table 13.1: Summary: Key estimates for the 2013/14 season

Crop & Area	Total direct allocated cost R/ha	Yield (t/ha)	Farm gate price (R/ton)	Cost per ton "crop" produced (R/ton)	Break-even yield (t/ha)
Maize:					
- Western Free State	R5 882	6.70	R1 780	R878	3.30
- Northern Free State	R6 429	5.80	R1 785	R1 108	3.60
- Eastern Free State	R6 664	6.53	R1 816	R1 021	3.67
- North West	R4 068	4.78	R1 695	R851	2.40
- Northern Cape	R18 024	13.95	R2 057	R1 292	8.76
Sunflower:					
- Northern Free State	R4 134	2.50	R4 687	R1 645	0.88
- North West	R3 280	1.32	R4 194	R2 485	0.78
- Eastern Free State	R4 233	2.01	R4 612	R2 106	0.92

Table 13.1: Summary: Key estimates for the 2013/14 season (continued)

Crop & Area	Total direct allocated cost R/ha	Yield (t/ha)	Farm gate price (R/ton)	Cost per ton "crop" produced (R/ton)	Break-even yield (t/ha)
Beans:					
- Eastern Free State: Soya beans	R3 894	2.36	R5 068	R1 650	0.77
- Eastern Free State: Dry beans	R10 329	1.65	R9 000	R6 260	1.15
Wheat:					
- Eastern Free State	R4 757	2.66	R3 413	R1 788	1.39
- Overberg(est.)	R4 893	3.39	R3 013	R1 443	1.62
- Northern Cape	R16 452	7.72	R3 201	R2 131	5.14
Barley:					
- Overberg(est.)	R4 685	3.39	R2 913	R1 382	1.61
Canola:					
- Overberg(est.)	R4 372	1.27	R4 596	R3 443	0.95

Whilst all crops performed well, the average direct costs per hectare associated with maize production was the highest of the crops included in the analysis. Combining yields and cost structures however results in the cost per ton of maize produced being the lowest of all the included crops. Even after accounting for the higher yields obtained, the costs associated with irrigated production were substantially higher than dryland equivalents.

Sunflower in the Northern Free State and soya beans in the Eastern Free State also performed very well, obtaining yields well above long term norms. In contrast, the 1.27 tons per hectare achieved from canola in the Overberg region was well below previous levels and only marginally above the break-even yield of 1 ton per hectare, implying that canola margins in the region were extremely tight.

Figure 13.3 illustrates gross margins for various commodities in different regions, arranged with the strongest performers in the 2013/14 season on the right. The comparatively low canola yield reduced canola margins and, combined with price levels attained, delivered a gross margin of only R1 465 per hectare. An additional 240 kilograms per hectare in yield, which would result in the 5 year average yield of 1.51 tons per hectare, would have generated a gross margin of R2 586. The average rain-fed maize margin was R4 799 per hectare, with the western Free State leading the way due to its high yield and consequently favourable cost structure on a per ton basis.

Maize produced under a double cropping rotation in the Northern Cape irrigation region generated a gross margin of R10 671 per hectare and was the most profitable crop in the BFAP network of prototype farms. Given its higher cost structure, this would indicate that the price obtained for maize in the Northern Cape was also higher, largely due to the reduced yield risk associated with irrigated production, which provides greater flexibility related to the time of marketing. The eastern Free State soya bean crop also performed exceptionally well in this particular season, driven by yields well above long term norms. In the winter producing region, wheat performed the best with a margin of R5 321 per hectare; however, barley was only marginally lower. Overall, Table 13.1 and Figure 13.3 indicate that the ability to obtain optimal yields remains the most important factor driving relative crop competitiveness.

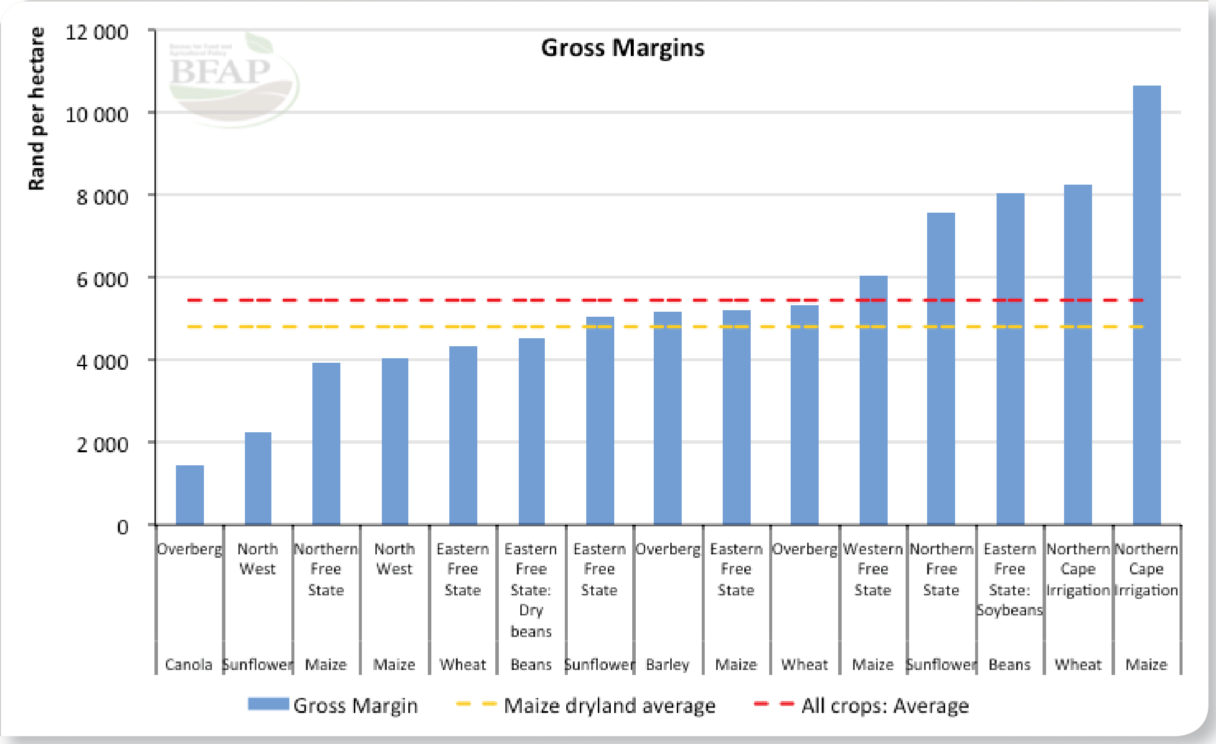


Figure 13.3: *Gross margins for selected crops on prototype farms in key producing regions: 2013/14*

Marketing strategies form an integral part in the decision-making environment of a farm business; timing and knowledge of international and domestic drivers are crucial, especially in periods where prices are extremely volatile. Individual farmers have their own strategies in order to mitigate risk whilst simultaneously endeavouring to obtain the highest possible price. The blue bars in Figure 13.4 portray the average farm gate prices actually obtained by the prototype farms in western, eastern and northern Free State, North West and Northern Cape. The yellow maize SAFEX price trend is utilized as a benchmark and is illustrated in two ways. Firstly, the actual SAFEX price is plotted over a period from October 2013 to December 2014. Secondly, the average transport or silo differential (basis) between the various regions (R220 per ton) was deducted from the actual SAFEX price, yielding a price that is more comparable price at the farm gate. Lastly, an additional benchmark is included where the average July contract price over the stipulated period, with the same average silo differential of R220 per ton already deducted. It is important to note that silo differentials will vary across the maize producing region, while other deductions such as handlings costs have not been accounted for. Figure 13.4 therefore represents a comparison and it would appear that opportunities exist in the timing of marketing.

Figure 13.4 represents only a single year and while some price variation is often evident over the course of a season, the magnitude of the presented range in 2013/14 was exaggerated by a number of factors including low stock levels domestically prior to new season deliveries, as well as limited import availability. Nonetheless, it is evident from the figure that producers hedge prices to limit risks, tending to price closer to the July contract with limited spot pricing. Consequently, the realized price at farm gate is often well below the average SAFEX price for the same period. Except for the Northern Cape producers, other regions all priced below even the less volatile July contract price.

From Figure 13.4 it is also evident that higher prices can be obtained by producers who are able to deliver maize earlier. Even in April and May, prices traded nearly R400 per ton above those recorded from June to August (R2 240 vs. R1 845 per ton). For illustrative purposes, an average yield of 4.5 tons per hectare would have resulted in an additional R1 775 per hectare which on a 600 hectare maize farm would have add another R1.06 million to the farm gross margin. As always, the challenge lies in the certainty of the crop. It is only at a later stage that farmers really have a good indication of the size of their crop, which essentially returns to the old principle of marketing

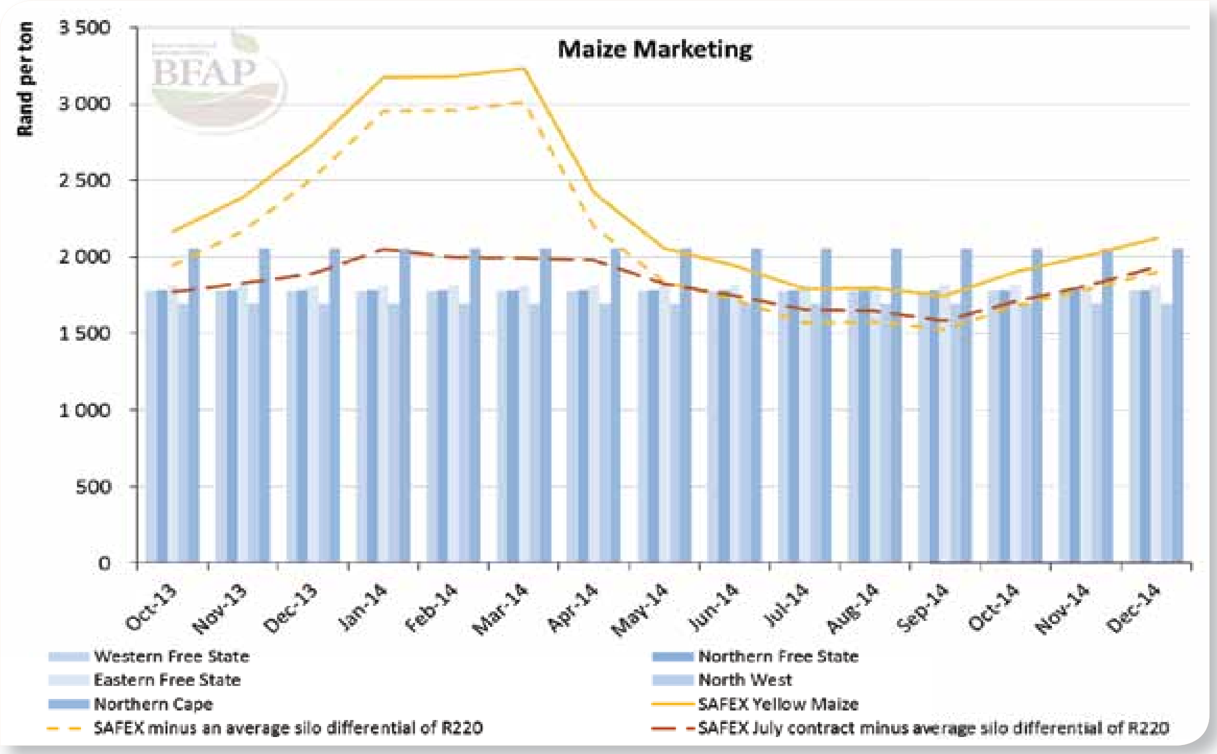


Figure 13.4: *Maize prices in 2013/14: Farm gate realisation vs. SAFEX yellow maize contract*

portions of the crop over time. The occurrence of a drought will always remain a wild card. For example, if a similar analysis is undertaken for the 2014/15 production season, the results will indicate that the maize prices followed an increasing trend towards the harvesting time as the reality of the drought was factored into the local maize market. A farmer who might have marketed a share of the potential white maize crop in January 2015 at approximately R2100/ton received R600/ton less at harvest time in June 2015 and on top of the loss in the market price the impact of a smaller harvest due to the drought also affects farm revenue.

To summarize, the 2013/14 production season will be remembered as a year of good yields and firm gross margins. The subsequent section focuses on the performance of South African producers in a global context which illustrates the relative competitiveness of the industry.

agri benchmark – South Africa's performance in a global context

The agri benchmark network is an international network of agricultural research and advisory economists aiming to create a better understanding of global farming and the economics thereof (www.agribenchmark.org). The objective of the agri benchmark initiative is to create a national and international database on farm information through collaboration between the public sector, agribusinesses and producer organisations. The link between the local and international network provides the means to benchmark South African agriculture with global farming systems. Figure 13.5 illustrates the countries currently included in the cash crop network.

Maize

Maize yields obtained, as well as nitrogen application rates per hectare on the network of prototype farms in South Africa are illustrated relative to key growing regions in Argentina, Brazil, Ukraine and the United States of America (US) in Figure 13.6. The values indicated represent an average over the period 2011-2013. The x-axis legend describes the country, size of the farm and the region the farm is located e.g. ZA1200NW indicates that the farm is situated in South Africa, comprises of 1200 hectares and is situated in the North West province.

From Figure 13.6 it is evident that the yields obtained in dryland maize production in South Africa, at an average of 4.71 tons per hectare between 2011 and 2013, was well below the sample average of 7.97 tons per hectare, mainly due to differences in crop potential. The representative farm in Iowa, US performed the best with a yield of 11 tons per hectare. Maize in this region is cultivated in rotation with soya beans and typically a conservation tillage approach is pursued with reduced stubble breaking. Average precipitation amounts to 800 mm per annum. Nitrogen application on South African rain-fed farms averaged 102 kilograms per hectare, where the irrigation region in the Northern Cape applied as much as 311 kilograms per hectare. The average application rate for Argentinian and Brazilian farms was 74 kilograms per hectare. Argentinian and Brazilian farmers also typically rotate maize with soya beans and therefore have to apply less fertilizer due to the nitrogen fixation that already takes place during the soya bean crop. The US farms in Iowa and Indiana applied on average 191 kilograms per hectare.

Figure 13.7 illustrates the establishment cost for a ton of maize, which therefore incorporates the respective yield levels. The black triangles reflect the average maize price obtained in 2012 and 2013. The respective cost averages are illustrated by the yellow (South Africa) and green (sample) dash lines. The cost of producing a ton of maize under dryland conditions in South Africa was significantly higher than the sample average. The fertilizer cost per ton accounts for a substantial share of this difference, as the cost of fertilizer in South Africa remains

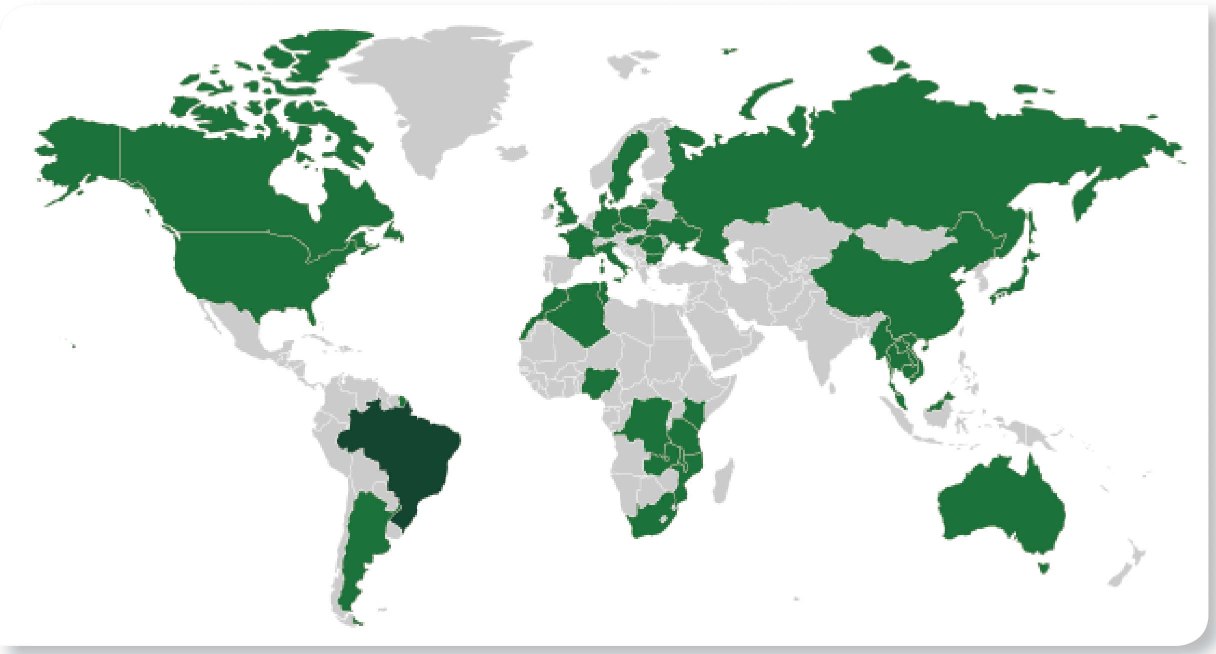


Figure 13.5: *Country coverage of the cash crop network within the agri benchmark initiative*

Source: agri benchmark

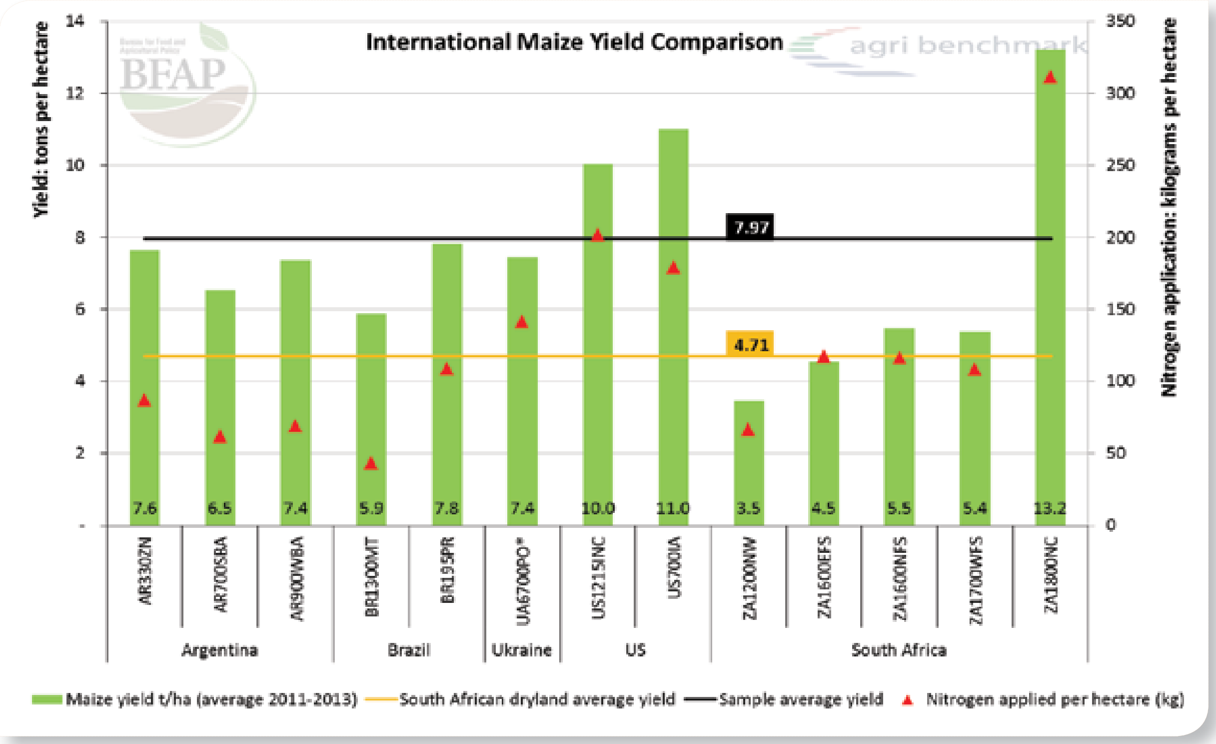


Figure 13.6: *Maize yields & nitrogen application per hectare - Average 2011-2013*
Source: agri benchmark, 2015

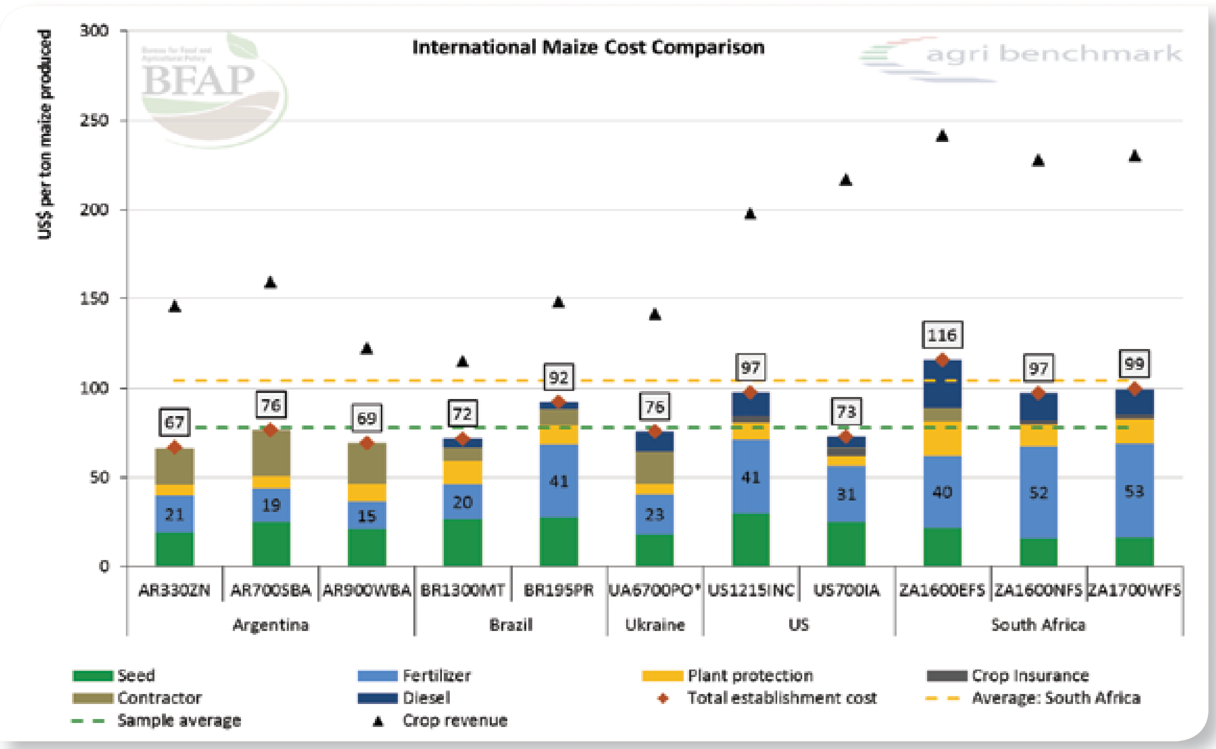


Figure 13.7: *Maize establishment cost & revenue per ton - Average 2012-2013*
Source: agri benchmark, 2015

well above the levels reported in the global sample space. The unit cost of fertilizer in South Africa is well above global norms (Figure 13.8) and when considering cost on a per ton basis, lower yields obtained in South Africa further exacerbate the already significant difference in per unit costs.

Despite the comparatively high cost structure, South African producers benefitted from a much higher maize price in 2012 and 2013. On average, producers obtained US$233 per ton in the stipulated period, compared to only US$138 in Argentina and Brazil and US$208 in the US. Margin wise, South Africa outperformed all the countries in the sample space.

From Figure 13.8, it is evident that the cost of nitrogen, on a per kilogram basis, was about 45% higher in South Africa compared to the US between 2011 and 2013. The magnitude of this differential remains a concern that impacts on the competitiveness of South African producers. Grain SA (2011) indicates that less than 20% of South Africa's fertilizer demand was imported in the early 1990's. By 1999, this number had increased to 40% and in 2008, more than 65%. Consequently, the exchange rate, deep sea freight rates, unloading- and administrative cost at ports and inland transportation are all contributing factors that drive the cost of imported inputs such as fertilizers higher.

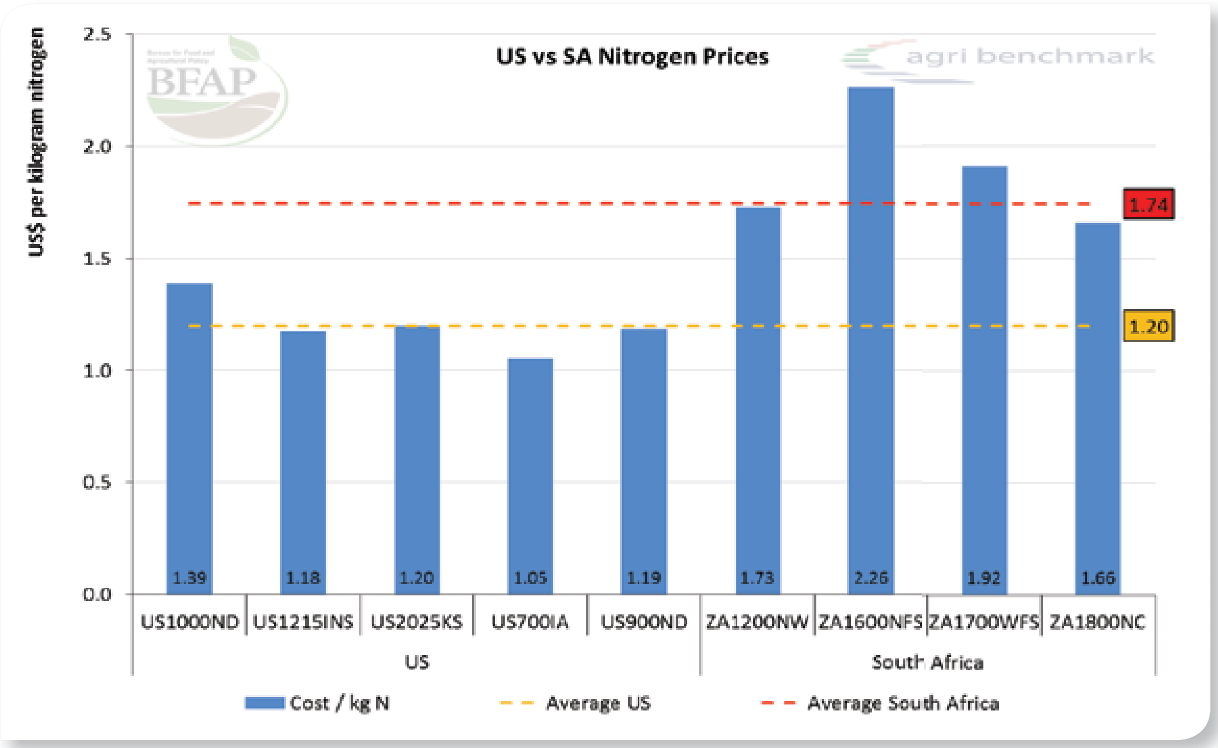


Figure 13.8: *Cost of nitrogen between the US & South Africa (2011-2013)*
Source: agri benchmark, 2015

Box 13.1: The impact of technology on the competitiveness of smallholder maize production

In 2007, Gouse, Kirsten and Van Der Walt estimated the total number of small-scale farmers planting genetically modified (GM) maize in South Africa at around 10 500. According to 2012 industry seed sales figures for Mpumalanga, KwaZulu-Natal and the Eastern Cape alone, more than 8 000 small-scale farmers bought and planted GM maize. Interestingly, while the GM seed sold in 2007 was mainly insect resistant (Bt) seed, only 8% of the GM seed sold in 2012 was Bt (single trait) with approximately 4 000 smallholders planting herbicide tolerant (single trait) seed and the remaining 42% planting 'stacked' (Bt+HT) maize.

HT seed also seems to be becoming the seed of choice for some smallholder development programmes. Table 13.2 presents maize production budgets for four smallholder farmers involved in a development initiative in KwaZulu-Natal. Basically the four farmers are from the same region and attended the same farmer days where information on inputs and production systems was shared. Based on the case study example it would seem as if farmers adopt and adapt production technology based on their initial endowment of machinery, cash or labour.

- The first farmer chose to stick with a traditional farming system using purchased (but re-plantable) open-pollenated seed and kraal manure and did hand hoeing and pulling to remove weeds.
- The second farmer planted HT seed and performed all activities manually, using family labour. The farmer applied the recommended quantities of fertilizer, lime and topdressing and sprayed a broad spectrum herbicide. Planting was done by making use of the ARC recommended 'planting without ploughing' no-till approach.
- The third farmer planted HT seed and all activities were performed by a contractor.
- The fourth farmer also planted HT seed and made use of his own tractor to do land preparation, planting, spraying (pre and post) and hired a contractor for harvesting.

Clearly, the traditional farming system requires the least amount of cash and when saved seed is used and family labour not priced the only real input cost is the transport of the kraal manure. This farmer and his household spent close to 50 days in the field for what seems to be an income loss of R1 230. However, under subsistence conditions family labour tends not to be seen as an expense (with limited alternative employment opportunities) and the yield is priced at a maize meal replacement value.

In comparison, the HT adopting family labour using farmer invested the same or slightly more labour time in maize production but by using the correct fertilizers, correcting soil acidity and by employing a labour productivity increasing technology such as the herbicides, was able to produce enough maize for his household and sell surpluses to recover input costs and earn an actual income on invested labour.

Compared to the farmer who uses his own tractor, the contractor fees seem rather high and even though the third farmer could have spent his time earning an off-farm income, the return on capital investment, in a relatively risky dryland environment, is low. The fourth farmer made a handsome profit but probably could have done even better by making use of an adapted no-till planter. Farm soil characteristics determine the extent to which conservation tillage practises can be adopted, but it might be possible to reduce the number of cultivations when a HT seed- broad spectrum herbicide combination is used.

Table 13.2: KwaZulu-Natal 2013/14 case study production budgets

		1 Traditional	2 Modern with only manual labour	3 Modern with contractor	4 Modern with own tractor
Gross income	R/ha	1800	9000	9000	9000
Yield	t/ha	1	5	5	5
Farm gate price	R/ton	1800	1800	1800	1800
Tillage					
Plough	R/ha	–	–	550	258
Disc	R/ha	–	–	350	142
Cultivator	R/ha	–	–	300	
Labour	R/ha	750	–	–	115

Table 13.2: KwaZulu-Natal 2013/14 case study production budgets (continued)

		1 Traditional	2 Modern with only manual labour	3 Modern with contractor	4 Modern with own tractor
Spray					
Herbicide	R/ha	–	188	255	255
Machinery	R/ha	–	–	350	125
Labour	R/ha	–	200	–	35
Planting					
Machinery	R/ha	–	–	600	310
Labour	R/ha	200	375	–	80
Seed	R/ha	900	1200	1200	1200
Fertilizer	R/ha	180	1532	1532	1532
Lime	R/ha	–	170	170	170
Plant production					
Herbicide	R/ha	–	550	429	317
Insecticide	R/ha	–	30	30	30
Machinery	R/ha	–	–	350	125
Labour	R/ha	750	200	–	35
Topdressing					
LAN	R/ha	–	486	486	486
Machinery	R/ha	–	–	350	132
Labour	R/ha	–	200	–	35
Harvest					
Contractor	R/ha	250	1100	–	–
Labour	R/ha	250	11001	–	–
Total variable costs	**R/ha**	**3 030**	**6 231**	**7 952**	**6 382**
Total variable costs without labour	**R/ha**	**1 080**	**4 156**	**7 952**	**6 082**
Gross margin per ha	**R/ha**	**-1230**	**2 769**	**1 048**	**2 618**
Gross margin if labour is not priced	**R/ha**	**720**	**4 844**	**1 048**	**2 918**
Labour days		49	52	0	8

Source: Gouse, Sengupta & Falkck-Zepeda (2014)

* A representative yield is assumed for the more modern production system farmers as planting dates played a big role in yield (actual yields were between 5.2 t/ha and 7 t/ha).

The labour dependant production system of the second farmer is typical of HT adopting subsistence and smallholder farmers in Mpumalanga, KwaZulu-Natal and the Eastern Cape. Gouse *et al.* (2014) showed that by using HT seed and a post-emergent broad spectrum herbicide, especially female farmers and household members can save labour, as weeding tends to be a female task. Farmers seem to prefer the labour saving benefit of HT above the yield protection benefit of Bt. As is illustrated in Figure 13.9, over three seasons, despite spending more time on herbicide application (in male headed households this tends to mean fetching water by females and children), females were able to save between 8 and 11 days (per hectare) of manual weeding.

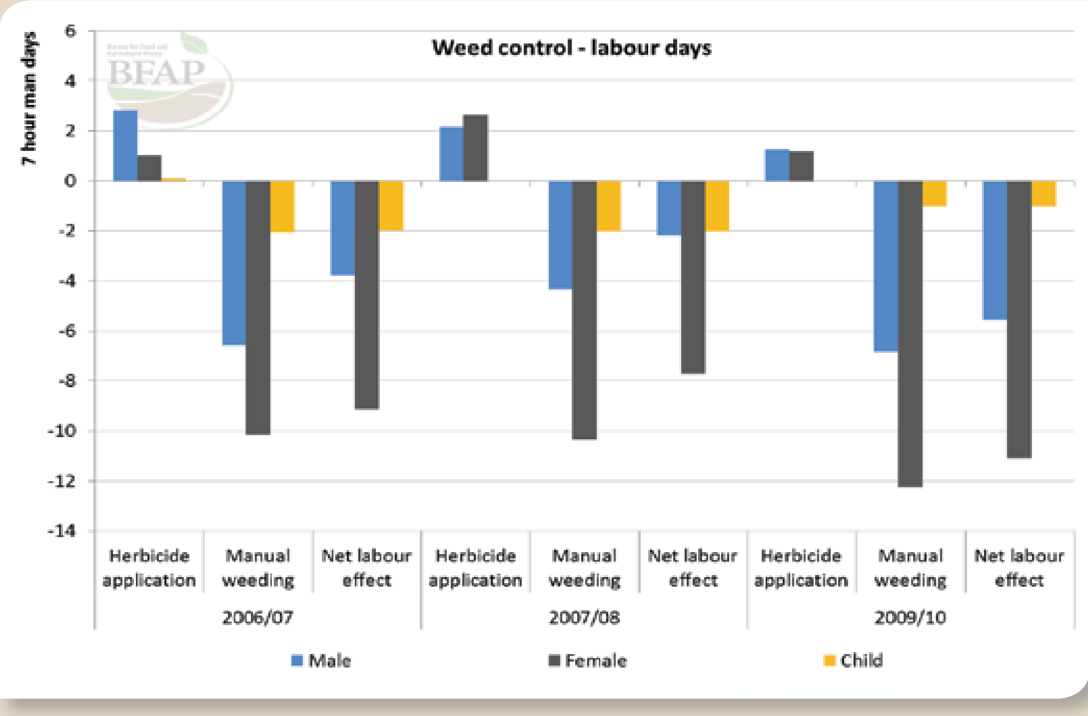


Figure 13.9: Weed control labour days - difference between manual weed control and HT with post-emergent broad spectrum herbicide

While a labour saving technology seems to be the opposite to what is needed in an economy with a high unemployment rate and where agriculture has been earmarked as a leading job-creation industry, smallholder farmers in South Africa almost exclusively rely on family labour and especially female labour. A weeding-labour saving technology that is not associated with expensive mechanisation or dependence on contractors, could decrease some of the drudgery associated with subsistence and small-scale agriculture.

HT crop based production systems and smallholder development programmes however need to take heed of a number of vital issues, including:

- Training of farmers on use of herbicides and HT seed
- Affordability and timely availability of herbicides and HT seed
- Climatic suitability of available HT varieties
- Sustainability requirements of no-till production systems
- Weed resistance development and management.

Wheat:

The yield levels obtained in key wheat production areas globally are indicated in Figure 13.10 and represent an average of the period 2011 to 2013, except for the western Buenos Aires farm in Argentina (only 2012 and 2013). The red dash line indicates the average yields obtained in the eastern Free State and Overberg regions in South Africa, which amounted to 2.79 tons per hectare over the stated period. Germany obtained exceptional yields of 8.60 tons per hectare over this period, which is comparable to the Northern Cape irrigation region. The wheat belt and South Coast regions in Australia averaged 2.67 tons per hectare, whilst representative farms in Kansas and North Dakota averaged at 2.92 tons per hectare. Judging by the yields achieved over the past few years, South African wheat farmers in the Overberg and Northern Cape area seem to compete relatively well with other wheat farms in the rest of the world.

Figure 13.11 portrays the establishment cost per ton of wheat, as well as the average revenue obtained over the period 2011 to 2013. The red dots show the market revenue per ton, and the green diamonds the revenue including decoupled payments which is more relevant in European countries. Decoupled payments made a significant difference to revenue, with German producers realizing approximately US$50 per ton more than the actual market price. Furthermore, the import parity status of South Africa supported firm wheat farm gate price levels when compared to the rest of the sample space. However, the cost of producing a ton of wheat in South Africa was also US$55 per ton higher, influenced mainly by relatively low yield performance in the eastern Free State and the higher cost of fertilizers. The Overberg region performed well in the sample space with a cost of US$116 per ton wheat produced. Margins on South African farms in the stipulated period outperformed all countries in the sample space, even when the decoupled payment is factored in.

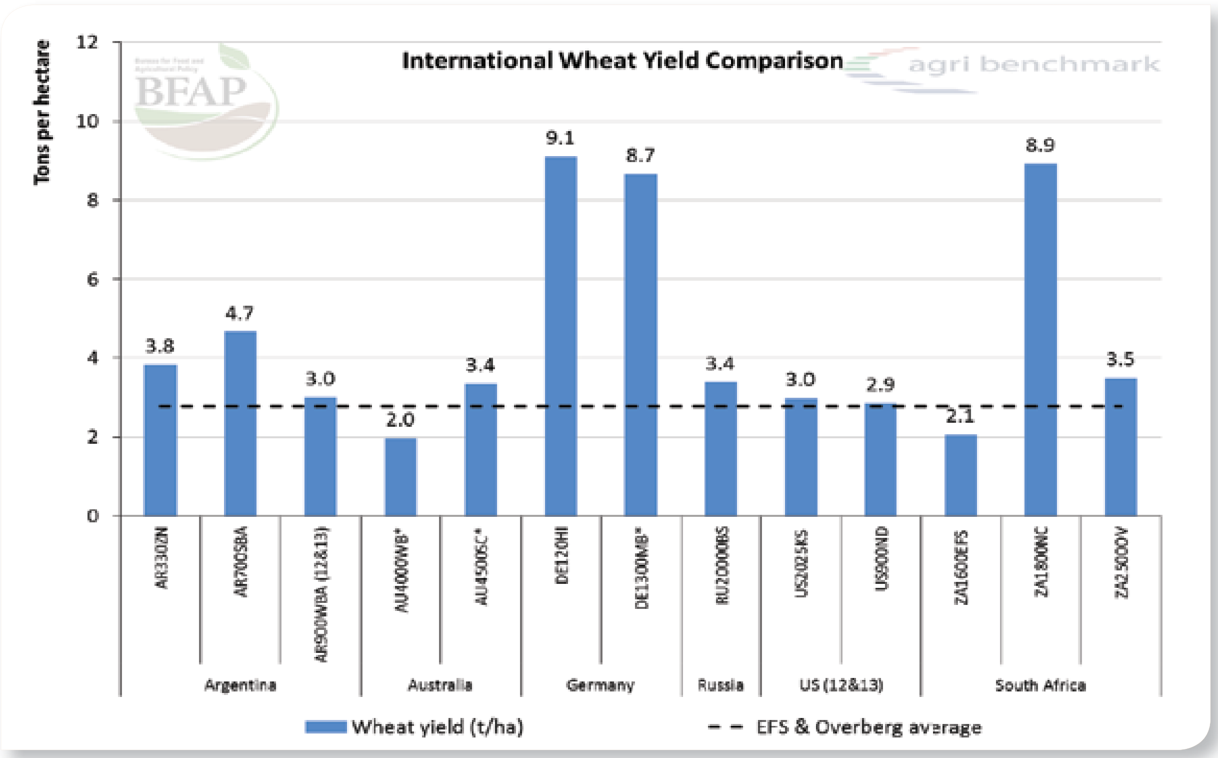


Figure 13.10: *Wheat yield per hectare - 2011-2013*
Source: agri benchmark, 2015

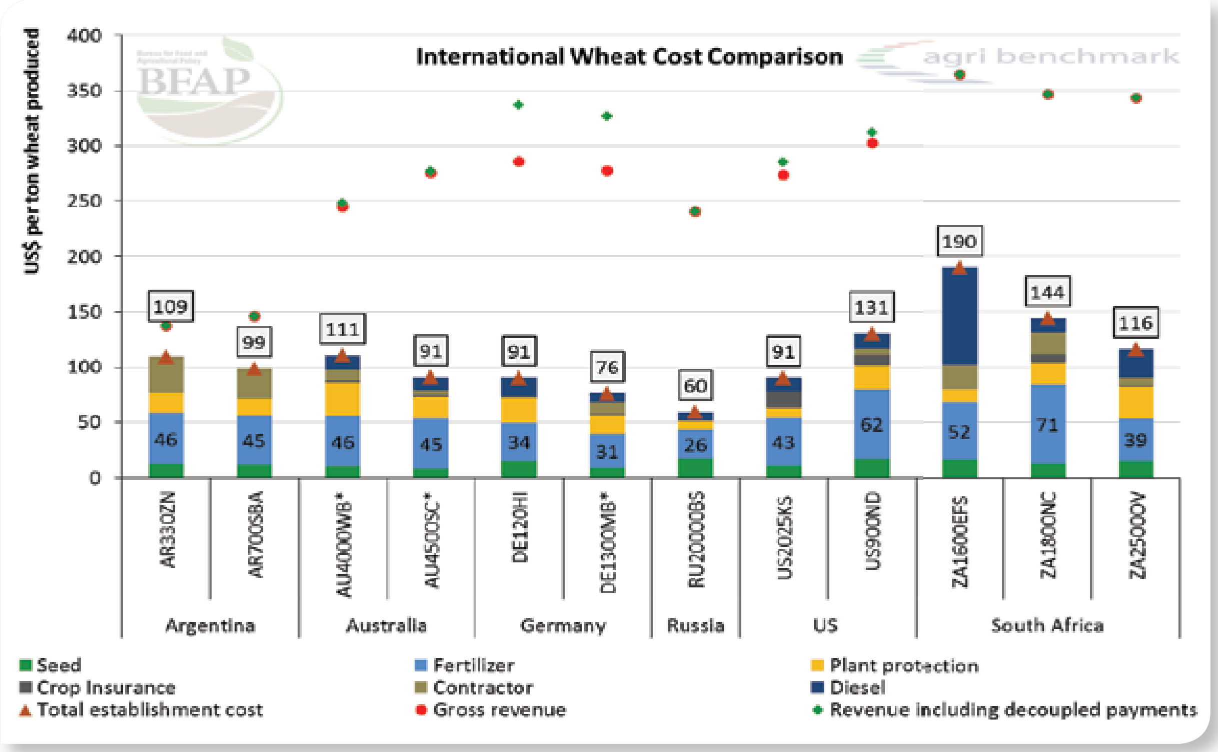


Figure 13.11: *Wheat establishment cost and revenue per ton – Average 2011 - 2013*
Source: agri benchmark, 2015

Outlook: Implication of the outlook projections on farm level

Having considered the performance of the prototype farm network over the past production season, the subsequent section links the price and input cost projections associated with the 2015 baseline to the network of prototype farms in the FinSim model, to illustrate the implications on farm level profitability. The BFAP FinSim model is a total budgeting model at farm level, which captures enterprise and business specifics such as asset structure and financing methods. Integrated into the BFAP modelling system, it has been used successfully to measure the impact of input- and market-related shocks or different policy decisions, as well as whole-farm planning (capital and operational expenditure), financial and economic feasibility at farm-level and risk analysis through stochastic simulation. Output is presented through various performance indicators such as farm gross margins, net farm income (NFI), return to family living (as a cash flow measure), the cumulative net cash balance (CNCB), the net worth, and the debt to asset ratio.

Farm gross margin projections

Table 13.3 represents key simulation results for the 2014/15 (estimates) and 2015/16 (normal weather assumed) production seasons and includes the projected direct expenditure, yield and farm gate price based on the deterministic baseline outlook. The widespread effect of the drought in the summer producing region is clearly visible; the projected dryland yield for the prototype farms averaged 3.18 tons per hectare, with the greatest impact evident in the North West province. Despite the persistent decline in world price levels, the continuous depreciation in the exchange rate offset some of this effect in the domestic market and in response to the drought, South African maize prices have trended upwards since December 2014.

Generally, the outlook for sunflower for the 2014/15 season is more favourable relative to maize, largely driven by its ability to perform better under dry conditions and further supported by the date of planting. For winter grains and the 2015/16 summer crop, normal weather conditions are assumed and key results are calculated based on trend yields. A return to more normal production levels, combined with further pressure on international maize prices result in a decline in farm gate prices for the 2015/16 season, however, towards 2017, commodity prices start a gradual recovery. Wheat prices continue to find support from the depreciating exchange rate, as well as the variable import tariff which is activated when the international reference price falls below US$294 per ton.

The respective gross margin calculations based on the parameters in Table 13.3 is represented in Figure 13.12, sorted according to the 2015/16 season's performance where the lowest margin is presented on the left of the graph and highest on the right.

The impact of the summer drought is clearly evident in Figure 13.12, with dryland maize gross margins averaging only R1 111 per hectare. In particular, maize in the North West and dry beans in the eastern Free State were the worst affected. The average gross margin for dryland crops cultivated in the summer rainfall region was R1 378 per hectare.

In contrast, maize and wheat production under irrigation in the Northern Cape is projected to perform very well, as drought induced high prices support profit margins where normal yields can still be obtained. As prices decline once more in 2016, maize margins in the irrigated region follow, however the projected maize margin in 2016 remains well above R8 000 per hectare. The average dryland maize margin in 2016 is projected at R4 299 per hectare.

Considering average gross margins for all dryland crops in

Table 13.3: Projections: Key simulation results: 2014/15 & 2015/16 season

Crop & Area	Total direct allocated cost R/ha	Yield (t/ha)	Farm gate price (R/ton)	Total direct allocated cost R/ha	Yield (t/ha)	Farm gate price (R/ton)
	2014/15 (Estimate June 2015)			2015/16 (normal weather assumed)		
Maize:						
- Western Free State	R5 962	3.40	R2 263	R6 132	5.87	R1 841
- Northern Free State	R6 532	3.25	R2 183	R6 730	5.88	R1 775
- Eastern Free State	R6 741	4.19	R2 122	R6 956	5.89	R1 897
- North West	R4 121	1.86	R2 215	R4 255	4.76	R1 802
- Northern Cape	R18 470	14.04	R2 169	R18 980	14.12	R1 940
Sunflower:						
- Northern Free State	R4 179	1.53	R4 714	R4 346	1.90	R4 823
- Eastern Free State	R4 206	1.54	R4 701	R4 373	1.74	R4 794
- North West	R3 331	1.01	R4 730	R3 461	1.61	R4 894
Beans:						
- Eastern Free State: Soya beans	R3 936	1.11	R4 984	R4 050	1.83	R4 822
- Eastern Free State: Dry beans	R10 519	0.78	R9 332	R10 799	1.61	R9 577
Wheat:						
- Eastern Free State	R4 704	2.32	R3 521	R4 912	2.37	R3 669
- Overberg	R4 973	3.05	R2 997	R5 130	3.05	R3 123
- Northern Cape	R16 823	8.35	R3 285	R17 348	8.52	R3 424
Barley:						
- Overberg	R4 756	3.08	R2 885	R4 894	3.11	R3 015
Canola:						
- Overberg	R4 435	1.57	R4 378	R4 563	1.62	R4 395

*Canola farm gate prices not finalized for 2014. Preliminary prices based on projected price index.

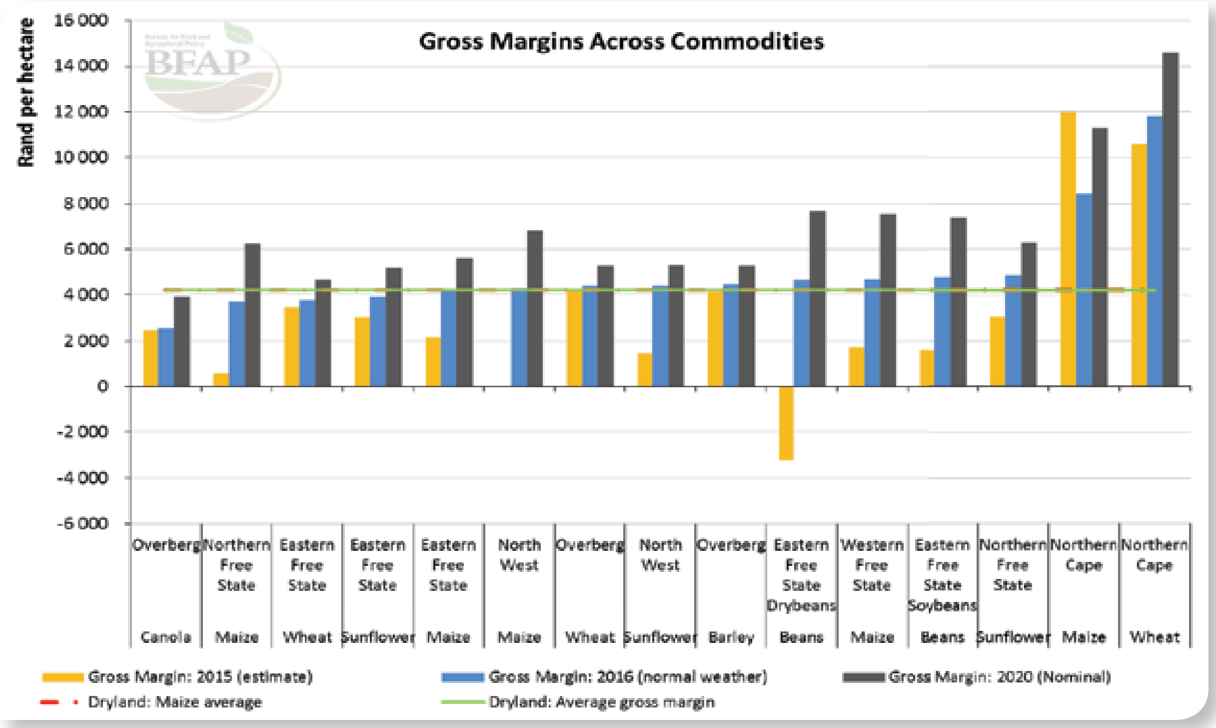


Figure 13.12: *Gross margin projections (2015, 2016 & 2020)*

2016, gross margins obtained from canola in the Overberg region, maize in the northern Free State and wheat- and sunflower production in the eastern Free State are projected to underperform against other dryland crops. The average margin is calculated at R4 212 per hectare.

Input cost trends

Apart from the current season drought, the baseline projections reflect relatively stagnant commodity prices and consequently the management of input costs becomes increasingly important. Figure 13.13 and Figure 13.14 illustrate the input cost composition in the North West province, Northern Free State and Northern Cape irrigation region. These figures illustrate that fuel and fertilizer together contribute a substantial share to total direct costs; on the North West representative farm, fuel and fertilizer alone contribute 55% to total direct cost and when seed is added, the share increases to 69%. Similar numbers are reported on the northern Free State prototype farm, where fuel and fertilizer constitute 56% of direct production costs.

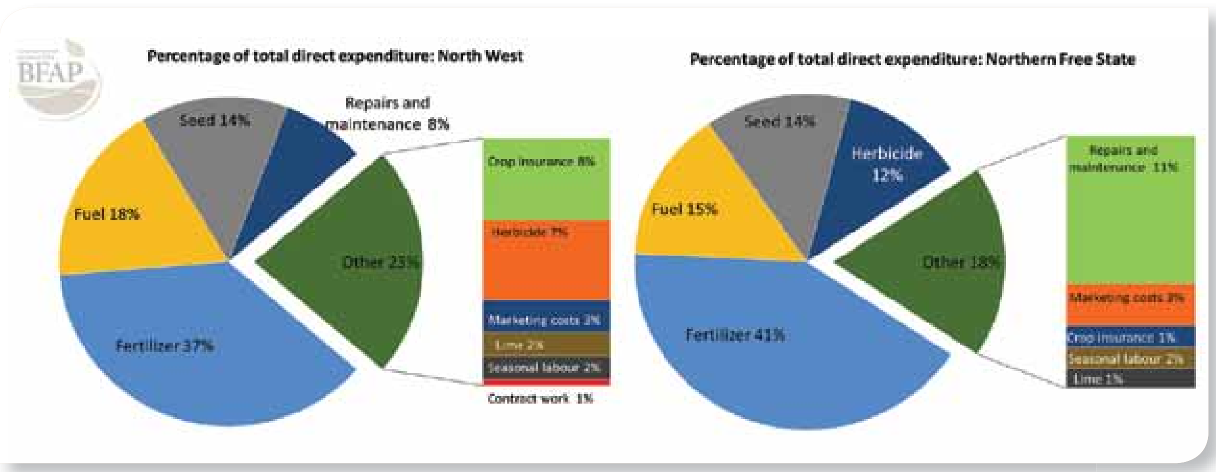


Figure 13.13: *Composition of direct input costs: Dryland maize in North West & Northern Free State*

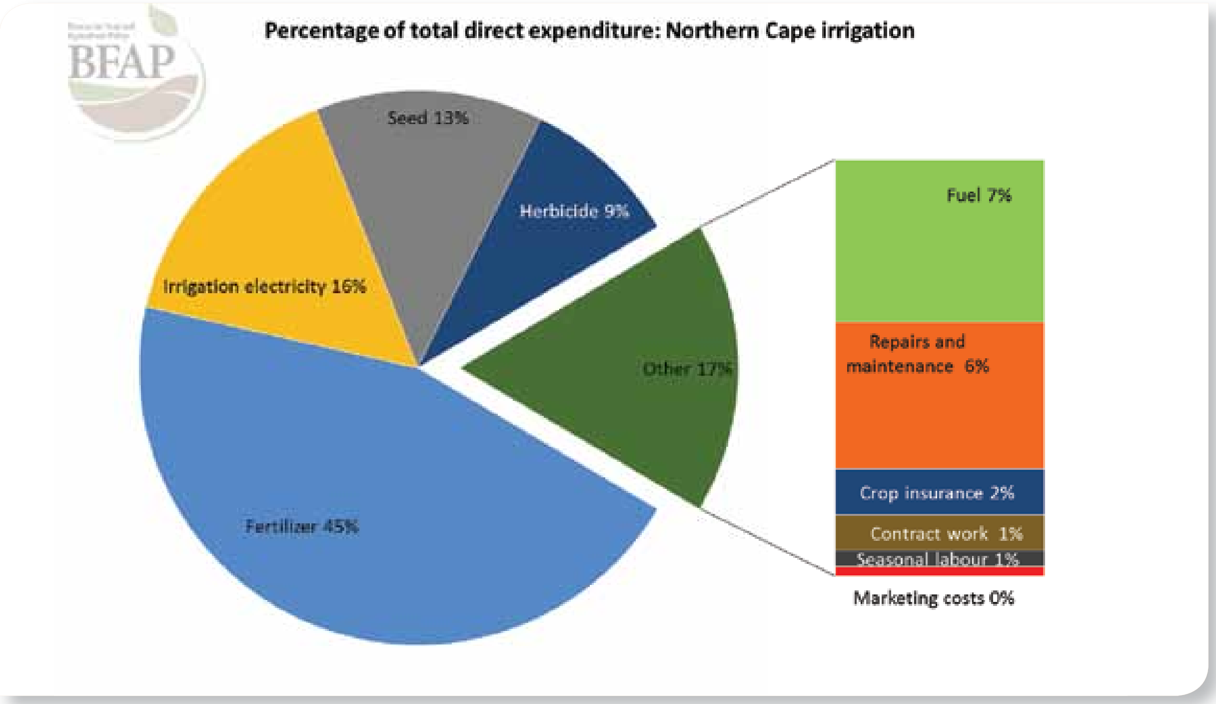


Figure 13.14: *Input contribution to total direct expenditure: Maize in Northern Cape*

Within the irrigated region, the input cost composition differs from dryland production in that irrigation electricity accounts for 16% of total directly allocable costs, reducing the share of fertilizer to 45%, with seed constituting a further 13%. Consequently, changes in electricity tariffs, such as the 12.2% already approved by the National Energy Regulator of South Africa (NERSA) for the 2015/16 financial year, will have a significant impact on the cost structure of irrigation farms.

Given its share in total costs, changes in the cost of energy and fertilizer could entail substantial changes in the total cost structure. As a net importer of fertilizer, international price movements, combined with exchange rate fluctuations, remain the core drivers of domestic fertilizer prices. Figure 13.15 and Figure 13.16 illustrate the historic trends and projected values for both international and domestic fertilizer prices. Internationally, the cost of urea and potassium has been on a declining trend since 2011 and Phosphate reflected a similar trend to 2013, when it turned marginally upwards. Whilst some decline was evident in 2015, international fertilizer prices are projected to increase marginally over the short term, in response to a recovery in energy prices. The increase in Urea prices is smaller than other fertilizer components, as the stated objective of the US government to become self-sufficient in terms of energy will increase production of derivatives such as Urea, reducing the cost thereof.

Domestic fertilizer prices are projected to rise at a faster rate than international prices in 2016 and 2017 (Figure 13.16), driven by continued depreciation in the value of the Rand, as well as costs related to transport and import administration. The cost of urea is projected to increase by almost 2%, surpassing R6 300 per ton in 2016, while the cost of phosphate is projected to increase by 6%, reaching R9 573 per ton by 2016. Potassium is expected to trade sideways from 2015 to 2016 at approximately R7 400 per ton. Figure 13.17 represents other input cost trends relative to a general fertilizer index. The cost of fuel is projected to increase by 6.85% from 2015 to 2016 and farm requisites by 4.82%.

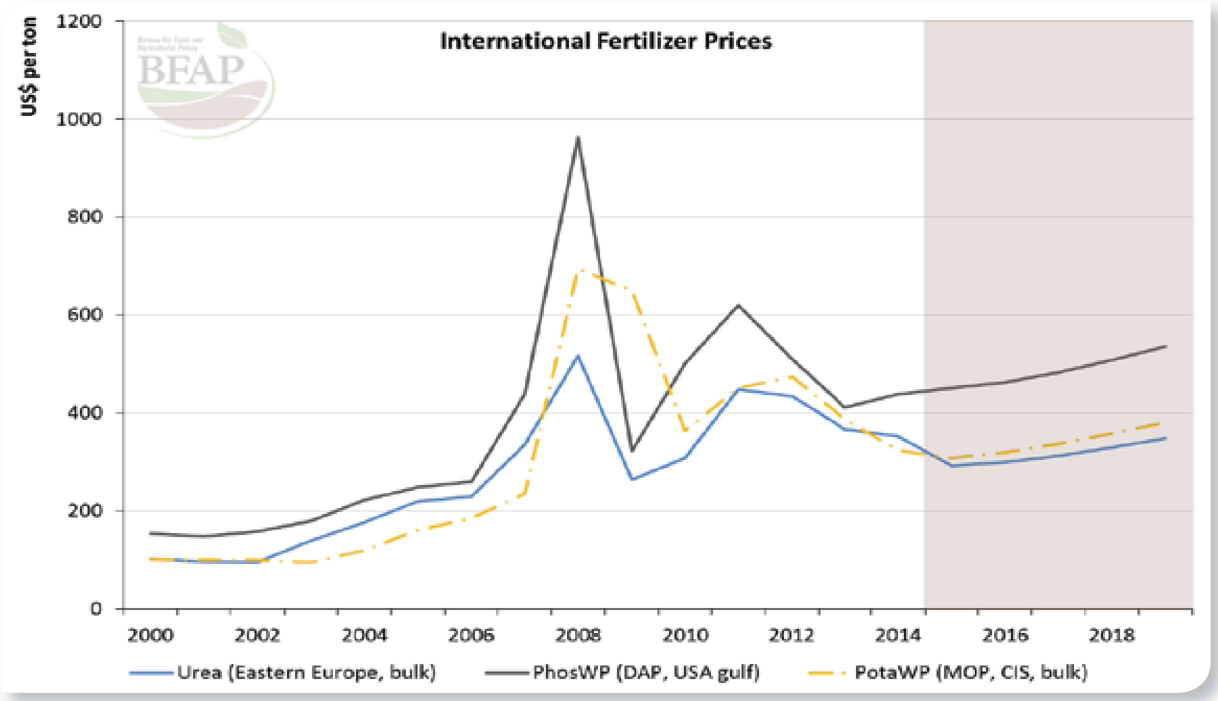


Figure 13.15: *International fertilizer trend & projections (2000-2019)*

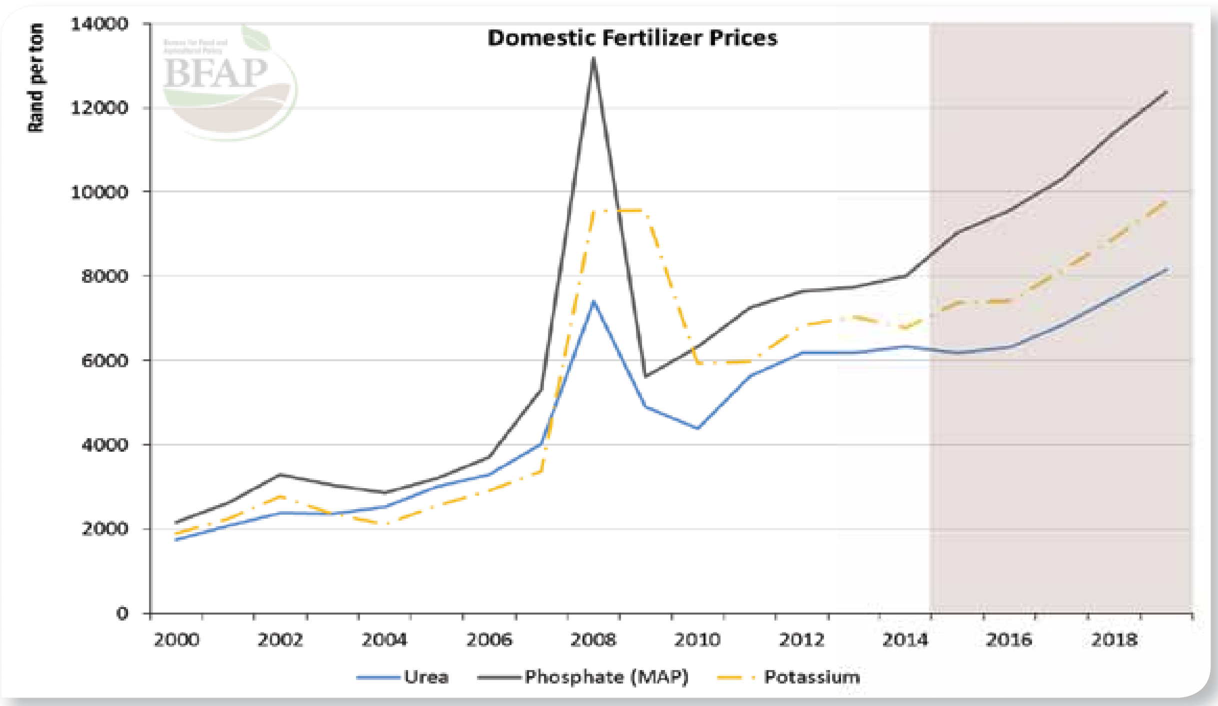


Figure 13.16: *Domestic fertilizer trends & projections (2000-2019)*

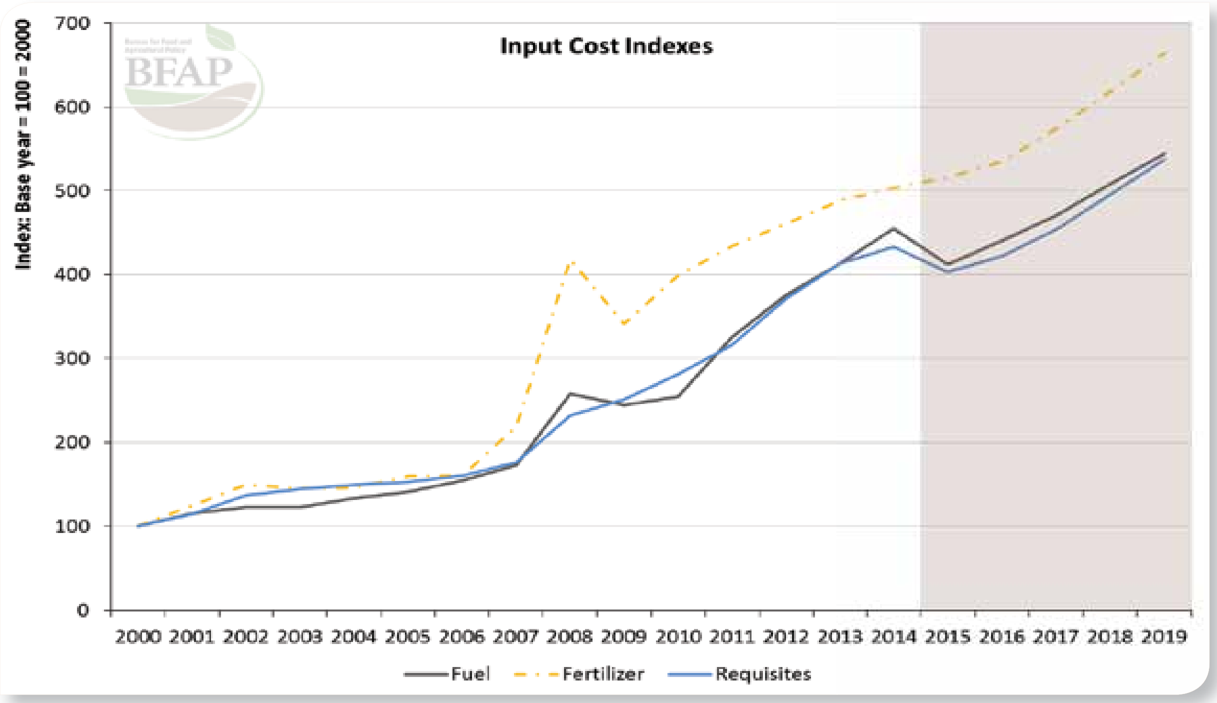


Figure 13.17: *Domestic input trends & projections (2000-2019)*

Whilst the fuel and farm requisites indices reflected a marginal decline in 2015, mainly in response so the lower Brent crude oil price, the medium term trend remains upward, based on the projected recovery in fossil fuel prices, as well as continued depreciation in the value of the Rand. Within the context of a lower agricultural commodity price cycle, management of the cost squeeze effect will be critical, requiring continuous growth in productivity levels in order to remain profitable. Given the tight margin projections under the baseline assumption of normal weather conditions, the management of typical risk and uncertainty associated with fluctuations in weather conditions will be increasingly important.

A stochastic simulation to measure risk:

Within the volatile environment in which agricultural producers operate, consideration of risk and uncertainty becomes increasingly important. In this regard, a stochastic modelling approach is employed to illustrate the relative performance of prototype farms in the North West and the northern Free State. A stochastic approach accounts for key uncertainties to incorporate risk into the decision making environment. For this purpose, a set of volatile variables are introduced into the model based on historic variations around the deterministic projections of the outlook. The key output variables identified for the analysis are yields, farm gate prices and fertilizer and fuel costs. The model is solved 500 times, with relevant variations in the key output variables to provide a range of possible outcomes for both prototype farms.

A stochastic model contains the random nature or most likely impact, meaning that the random variables and relationships in the model will allow the output to enclose random elements or probability distributions. The functioning of stochastic models and the random nature thereof incorporate risk by allocating probability distributions to specific exogenous and endogenous variables. Probability and cumulative distributions represent a simulation of key output variables in stochastic surroundings which quantify and compare risks that are associated with different scenarios and decisions.

Farm background

The North West prototype maize farm is situated in the Lichtenburg region and comprises maize, sunflower and livestock enterprises. Although farm sizes differ across the region, the analysis is based on the assumption that producers typically utilise 914 hectares of arable land per annum, allocated to maize (83%) and sunflower (17%). Significant fluctuations in yield levels have been evident in the past due to multiple periods of drought in the region. The Northern Free State proto-type farm is situated in the Bothaville region and for the purpose of this analysis, is assumed to cultivate maize and sunflower on roughly 1 320 hectares. Producers in the region have recorded good yields in recent seasons for both maize and sunflower production; however, the 2014/15 drought has been particularly severe in this region.

Key stochastic simulation results

Figure 13.18 represents the gross margin associated with maize production in the North West province by illustrating the minimum, mean, maximum and random gross margin levels as a range of possible outcomes. The mean projections for 2016 and 2017 are calculated at R4 205 and R5 694 per hectare where the 2017 projection is supported by a higher farm gate price. The mean result would be representative of normal weather conditions prevailing over the projection period.

For the North West province, sunflower is projected to perform better than maize in 2016, due to continued pressure on world grain prices, further supported by a stronger supply response and consequently lower prices in the domestic maize sector (Figure 13.19). Maize margins do recover somewhat in 2017. Similar results are simulated in the Northern Free State region, where high input costs associated with increased application rates relative to the North West positions producers in a typical cost-price squeeze. In 2016, the gross margin of maize is projected to be more than R1 200 per hectare below that of sunflower. Producers in the northern Free State's ability to obtain high sunflower yields further support the high gross margin projection for the 2015/16 season.

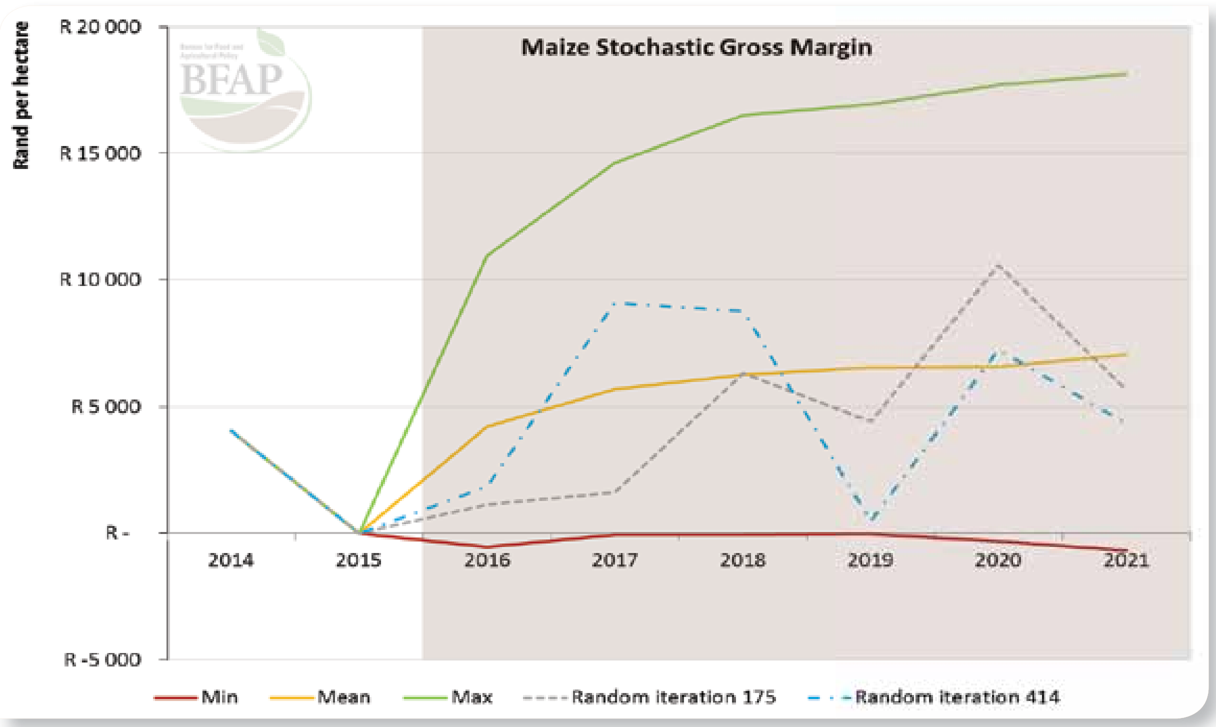


Figure 13.18: *Stochastic simulation of gross margins per hectare for maize in the North West*

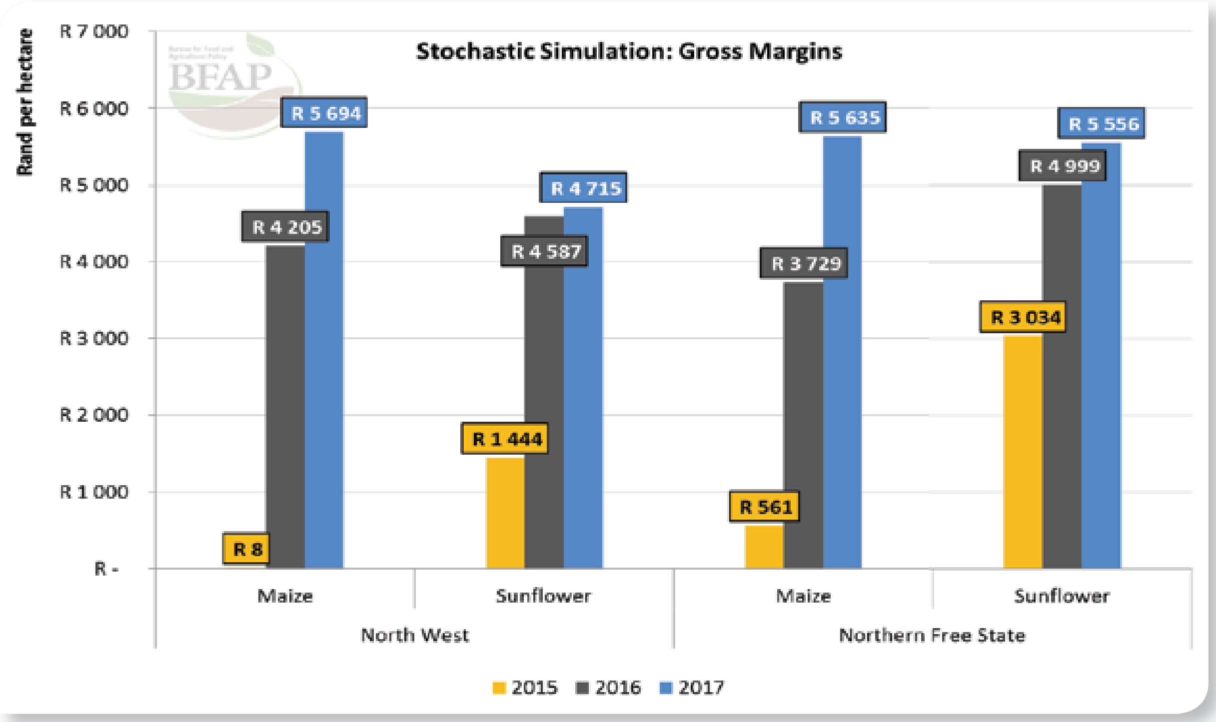


Figure 13.19: Mean gross margins: crop competition in North West and northern Free State

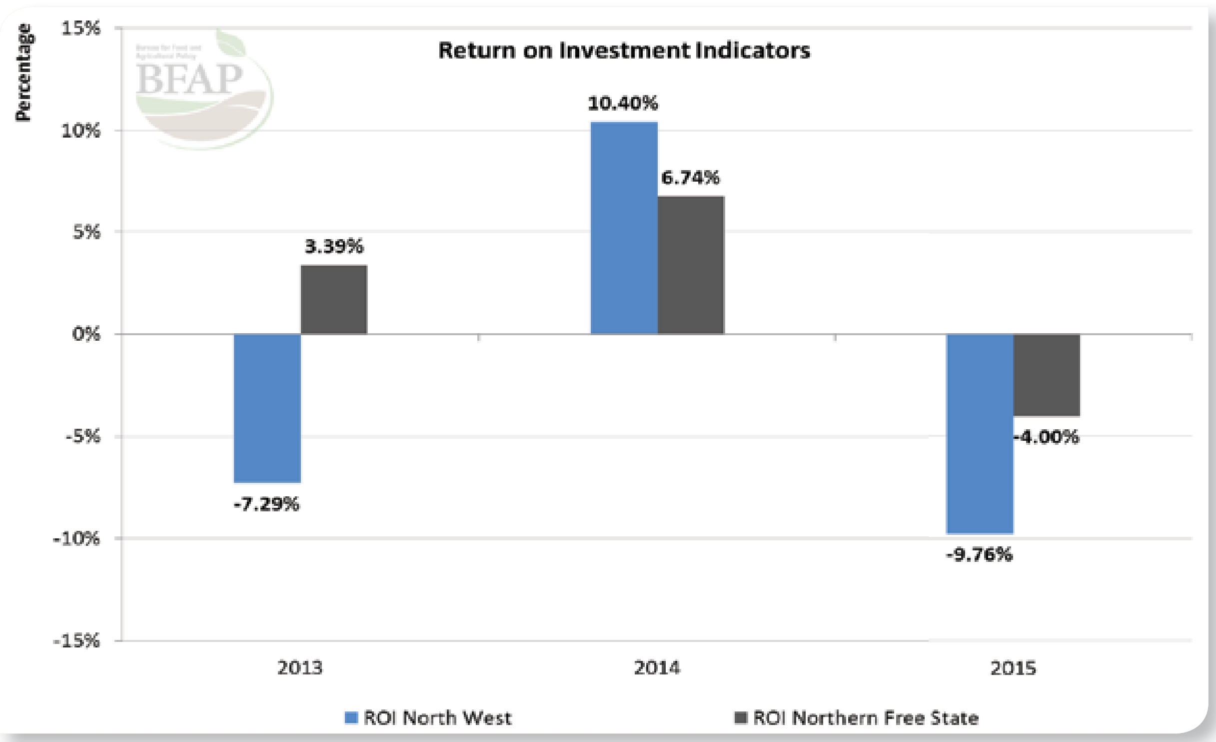


Figure 13.20: Return on investment indicators: North West & northern Free State

The impact of insufficient precipitation in 2013 and 2015 can be illustrated by observing the return on investment (ROI) for the North West and northern Free State prototype farms depicted in Figure 13.20. For the purpose of this illustration, net farm income was related to the value of land and fixed improvements, implements and machinery to generate a return on investment. In order to remain profitable and sustainable, businesses will pursue an annual income in excess of inflation, whilst also benchmarking returns to other financial performance indicators such as government bonds, long term investment returns provided by financial institutions/banks or the performance of stock exchanges. Ultimately, this relates to the opportunity cost of money or investment, where the amount of risk incurred is used as an important proxy for return. Figures 13.20 and 13.21 illustrate that producers faced a significant amount of risk over the past few seasons, with negative returns evident on the North West farm in 2013 and 2015. Similarly, the northern Free State farm is also expected to record a negative return of approximately 4% in 2015 following the drought.

Figure 13.21 further elaborates on the risk position by considering the probability of exceeding a specified return. The stoplight chart presented for the northern Free State prototype farm illustrates the probability of generating a ROI that ranges between 5% and 8%, from 2015 to 2018. The red bars indicate the probability that the ROI will be below 5%, the yellow bars indicate the probability that the ROI will range between 5 % and 8% and lastly, the green bars indicate the probability of ROI exceeding 8%.

Coming from a period of profitable field crop production, the return to favourable weather conditions globally, combined with the sharp decline in fossil fuel prices has induced a cycle of lower agricultural commodity prices. Whilst favourable for livestock production, the cycle has implied tighter margins in the field crop sector, which is projected to continue in the short term. Figure 13.21 illustrates that, whilst the expected return on the Northern Free State prototype farm is not favourable due to the drought, even under the assumption of normal weather conditions in 2016, the probability of generating a return higher than 8% remains only 28%, with a 48% probability of a return exceeding 5%. Compared to inflation, as well as alternative investment opportunities, such returns are unlikely to attract many new investors into agriculture, which will likely result in further consolidation of farms and more stagnant land prices relative to the past 5 years. However, such commodity cycles have also been evident in the past and over the medium term, the projected recovery in prices from 2017 onwards results in more favourable return prospects, with the probability of obtaining a return exceeding 8% increasing to 57% by 2018.

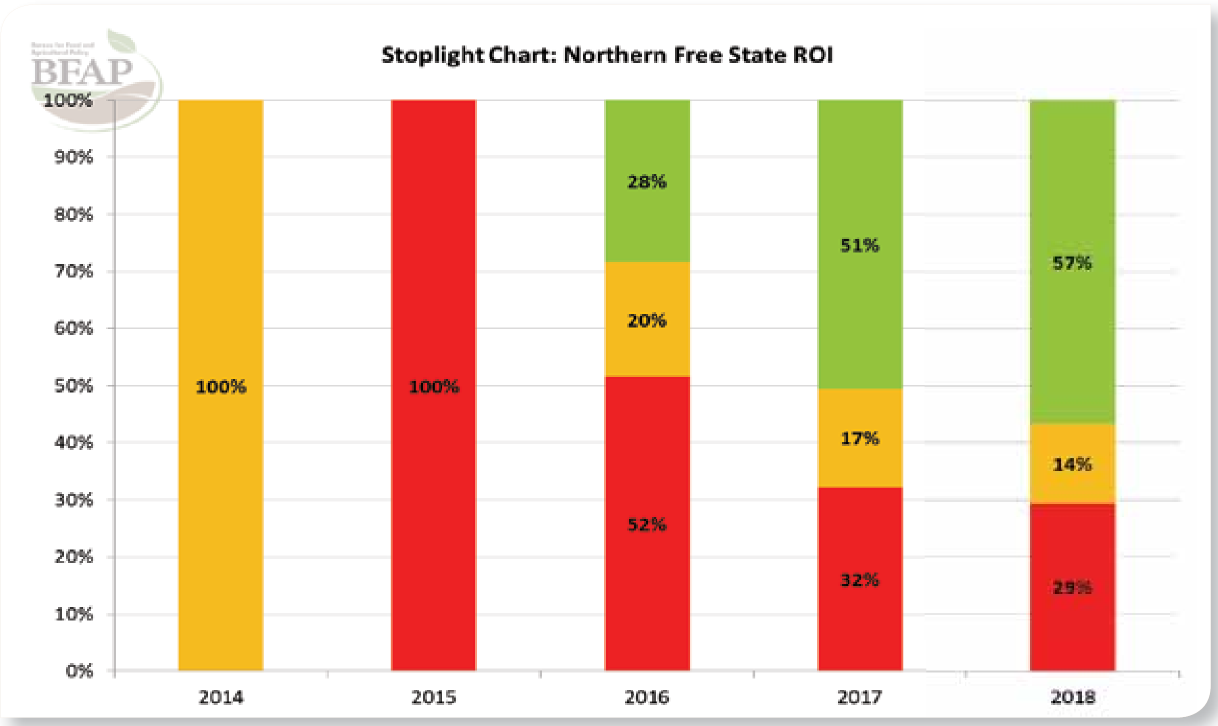


Figure 13.21: *Stoplight chart: Probability of generating a ROI between 5% and 8%: Northern Free State prototype farm*

Intensive livestock production systems

For several years, livestock producers globally have been faced with a highly uncertain environment, largely due to high and exceptionally volatile feed grain prices. Particularly in sectors such as pork and poultry, which are characterised by intensive use of feed grain in the production system, profit margins came under severe pressure. Within the global context, the sharp decline in feed grain prices set the scene for renewed profitability in these sectors in 2014; however South African producers were denied the same relief as drought conditions prevented a significant decline in feed costs.

South Africa remains a net importer of both pork and poultry and consequently prices tend to be guided by import parity levels. Within the broiler sector in particular, imports constituted almost 20% of total domestic consumption in 2014, up from only 12.5% in 2004. The rise in quantities imported, as well as various applications brought by the industry for increased tariff protection, has led to questions regarding the industry's ability to compete in the global context. Consequently, BFAP has undertaken different analysis related to the competitiveness of both poultry and pork production in South Africa, allowing for the expansion of the BFAP farm level modelling program to include prototype pork and poultry production units.

This section will provide some insight into the performance of intensive livestock production in South Africa within the global context, before illustrating the implications of the 2015 baseline on a prototype broiler production unit.

Pork

Compared to global norms, pork production constitutes only a small share of the South African meat complex; however the industry has grown tremendously over the past decade, expanding production by more than 40%. Pork is a new addition to the agri benchmark initiative, providing an opportunity to evaluate the performance of the South African industry in the global context. Through the standardised methodology applied within the agri benchmark network, three prototype farms in South Africa's most important production regions will be benchmarked against 10 member countries, accounting for 80% of global pork production between them. Presently, the network includes Germany, France, Spain, Denmark, China, Vietnam, Russia, Poland, South Africa and Brazil. The prototype farms in South Africa were identified in collaboration with the South African Pork Producers Organisation (SAPPO), chosen to be representative of production in the Western Cape, KwaZulu-Natal and a single prototype farm that represents large scale producers in the central and northern regions, including Gauteng, North West and the Free State.

With the first results from the agri benchmark network only due for publication later in 2015, only limited technical comparisons are presented in the global context, with a more detailed analysis of the relative performance of the farms situated in different production regions in South Africa. Considering efficiency indicators related to breeding, large scale producers in the central region, as well as the Western Cape performed better than the medium scale producer in KwaZulu-Natal. Pre-weaning mortalities in particular were significantly higher for the KwaZulu-Natal producer, resulting in a substantial reduction in the number of pigs marketed annually per sow (Figure 13.22). Future seasons will show whether this is a general trend or just a seasonal anomaly.

Preliminary indications related to feed conversion ratios obtained in the different countries included in the network illustrate that South African producers compare well to their international counterparts. Figure 13.23 presents the efficiency in converting feed to meat, illustrating that in both of the coastal regions in South Africa, the amount of feed required to produce a kilogram of meat was below the average of the sample space. Given the difference in production systems globally, total feed conversion ratios calculated for farrow to finish systems employed in South Africa are not comparable to feed conversion ratios calculated on specialised finishing farms in Germany for example. In order to compare feed conversion credibly, feed conversion ratios were recalculated only for grower pigs, based on feed usage and weight gained in the grower barn. Feed conversion in the grower barn only was higher in the central region than in the two coastal regions. This is attributable to the fact that piglets enter the grower barn at a later stage. Feed conversion performance declines as pigs grow older and heavier and as such the recorded feed conversion in the grower barn of the central producer is expected to be higher relative to other producers. Starting weights recorded in the other countries illustrated in Figure 13.23 are comparable to those achieved in South Africa's coastal regions.

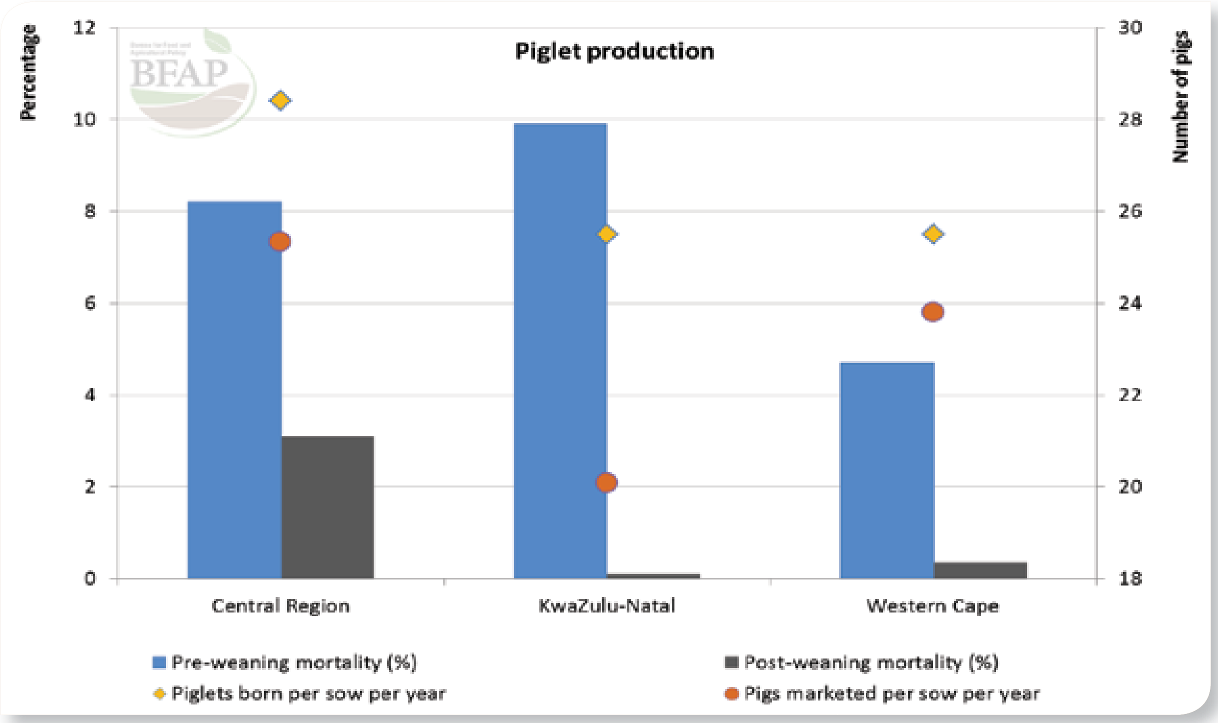


Figure 13.22: *Piglet production efficiency, 2013*

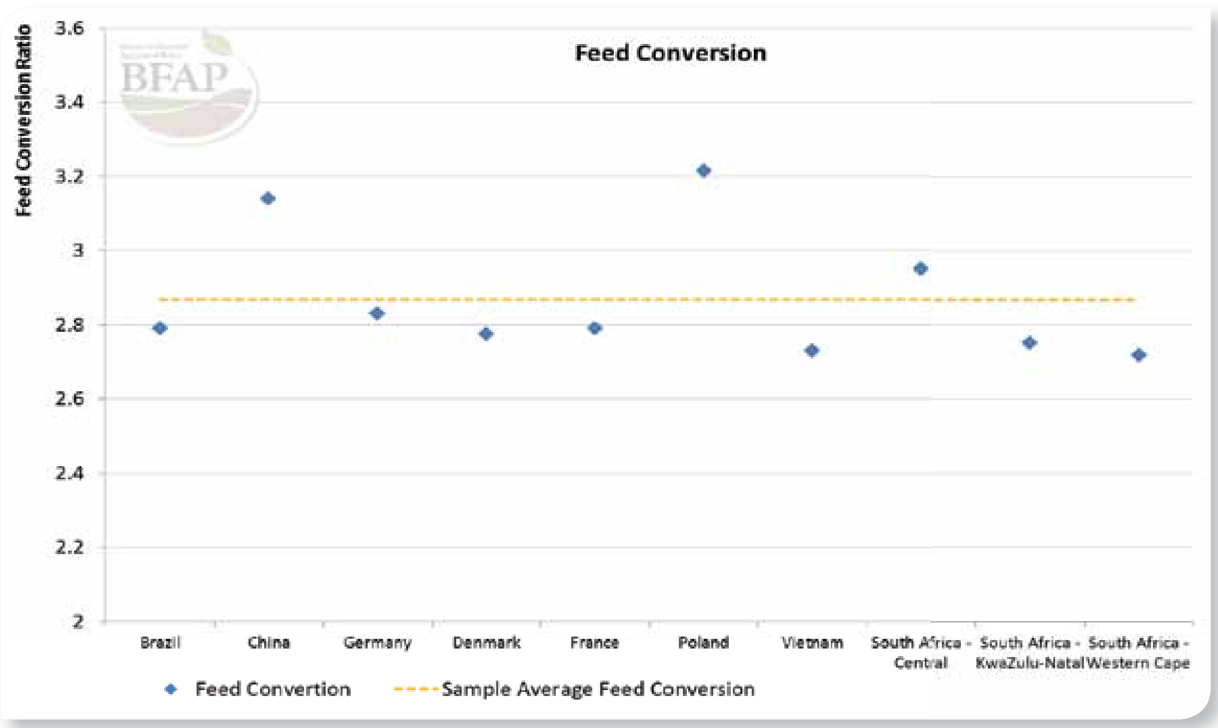


Figure 13.23: *Feed conversion ratios – specialised finishing, 2013*

Given its share in total variable production costs, the cost of feed remains the most important factor that influences the economic competitiveness of pork producers. In this regard, feed costs in South Africa are generally higher than in countries such as the USA and Brazil, mainly as a result of higher protein meal prices. Apart from these differences in the global context, significant variation was evident in the cost of feed in the different regions within South Africa. Figure 13.24 illustrates the cost of producing a kg of pork across the three regions, as well as the relative cost of feed per ton within each region. In this context, cost of production is also influenced by the technical efficiency parameters illustrated in Figure 13.22, as the cost per kg of meat produced will be lower when the amount of pork produced per sow is higher.

While the best feed conversion ratio was recorded in the Western Cape, feed costs per kg meat produced remains lower in the central region due to reduced feed prices. The average cost of feed on a per ton basis was significantly lower in the central region relative to the two coastal regions (Figure 13.24). These differences can be attributed to factors such as differences in formulation, as well as the cost of raw materials. In the Western Cape, feed is procured commercially, in pre-mixed form and hence the expectation would be for feed to be more expensive; however the highest feed costs on a per ton basis was recorded in KwaZulu-Natal, where feed is mixed on farm. While the Central region producers also do on farm feed mixing, making use of very similar raw material than the KwaZulu-Natal producer, the costs of the raw materials were higher in KwaZulu-Natal. This provides a clear indication that proximity to the main feed grain producing regions provides a significant cost advantage for pork producers.

In the Western Cape, raw material usage in feed rations differed significantly from the other two regions, as usage of locally available raw materials such as lupines and wheat bran is much higher, while yellow maize and soya bean meal usage is much lower in order to increase the competitiveness of feed costs. Nevertheless, yellow maize still accounts for more than half of the total feed ration and given the transport costs, feed rations remain substantially more expensive than in the central regions.

In addition to the cost of production, farm profitability remains the ultimate indicator of economic efficiency. Typical performance measures include net farm income, gross margin, net margin and return on investment. Louw *et al.* (2011) indicate that acceptable net profit margins for South African pork producers are between 10%-15%, with returns greater than 15% considered exceptional. Returns below 10% were however considered unacceptable given the capital investment required as well as the associated levels of risk.

While significant variability is evident in the cost of production across regions, producer prices recorded in 2013 are similar (Figure 13.25). Marginally higher prices were recorded in the central region, however porkers are generally marketed at a premium to baconers and as the share of porkers in total number of carcasses marketed is much higher in the central region, higher average prices per kg are to be expected.

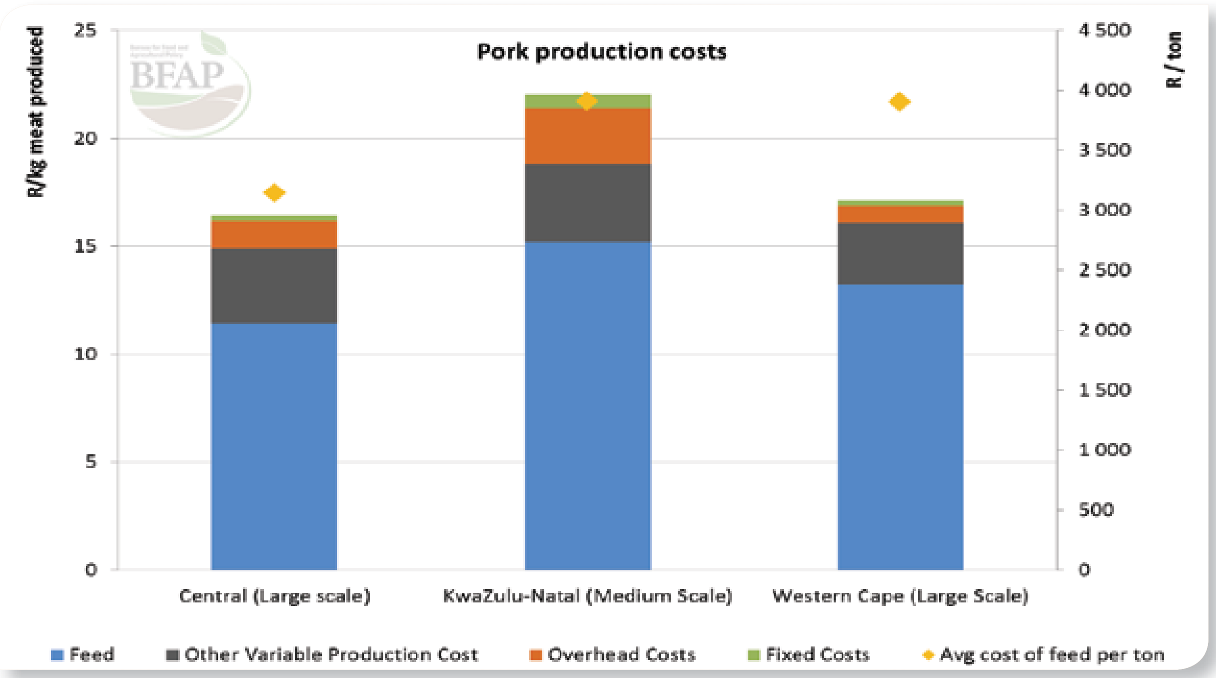


Figure 13.24: *Pork production costs across regions, 2013*

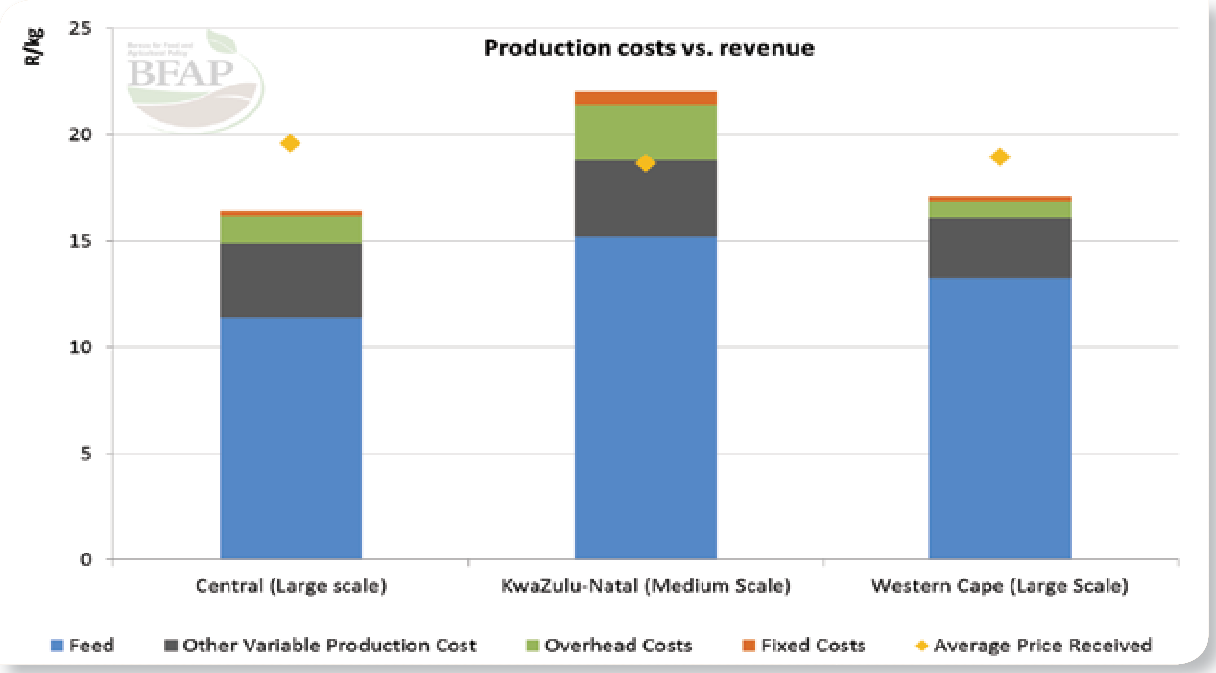


Figure 13.25: *Pork production costs and revenue across regions, 2013*

Margins obtained per kg meat produced were highest in the central region, where returns were the highest and cost of production the lowest. Returns in the coastal regions were similar, however high costs of production in KwaZulu-Natal resulted in negative margins in 2013, while a small positive margin was achieved in the Western Cape (Figure 13.25).

In light of its new inclusion in the farm level program, the figures presented in this section represent only a single production year and consequently may not be fully representative of long term trends. Furthermore, 2013 was a particularly difficult year for pork production due to the sharp increases in global feed grain prices. Nonetheless, the benefits associated with economies of scale and improved technical efficiency are clearly evident. The projections presented in this Outlook indicate a return to more favourable meat to feed price ratios over the next decade under the assumption of normal weather conditions and consequently, margins associated with pork production are expected to improve.

Poultry

Poultry represents the dominant sector in the South African meat complex, accounting for more than 60% of total meat consumed in South Africa between 2012 and 2014. Poultry is not included in the agri benchmark network to date and consequently, South Africa's competitiveness in the global context is based on information obtained from the LEI, a research institute within Wageningen University in the Netherlands. A survey was conducted in South Africa regarding technical productivity indicators, as well as the cost of production.

Figure 13.26 indicates that feed conversion ratios achieved in South Africa in 2013 compare well to international counterparts; the 1.68kg of feed required to produce 1 kg of chicken was well below the sample average feed conversion of 1.79. However, differences in feed conversion ratios should be interpreted within the context of differences in slaughter weights. Slaughter weights in South Africa were the lowest of any country in the sample and in light of the fact that the efficiency of converting feed to meat declines as chickens grow older, the shorter production cycles utilised in South Africa are expected to be associated with improved feed conversion ratios.

Figure 13.27 illustrates the costs associated with primary broiler production in selected regions. As the greatest single cost component, the bulk of the difference in production costs is attributed to differences in the cost of feed, which also impacts on the cost of day old chicks. It is evident that countries that are net exporters of key feed materials such as maize and protein meal have a significant advantage in the cost of feed as well as day old chicks. Furthermore, South Africa relies on imported genetics and while this allows for continued access to the best genetics globally, it further increases the cost of day old chicks. As a share of total production costs, the combined cost

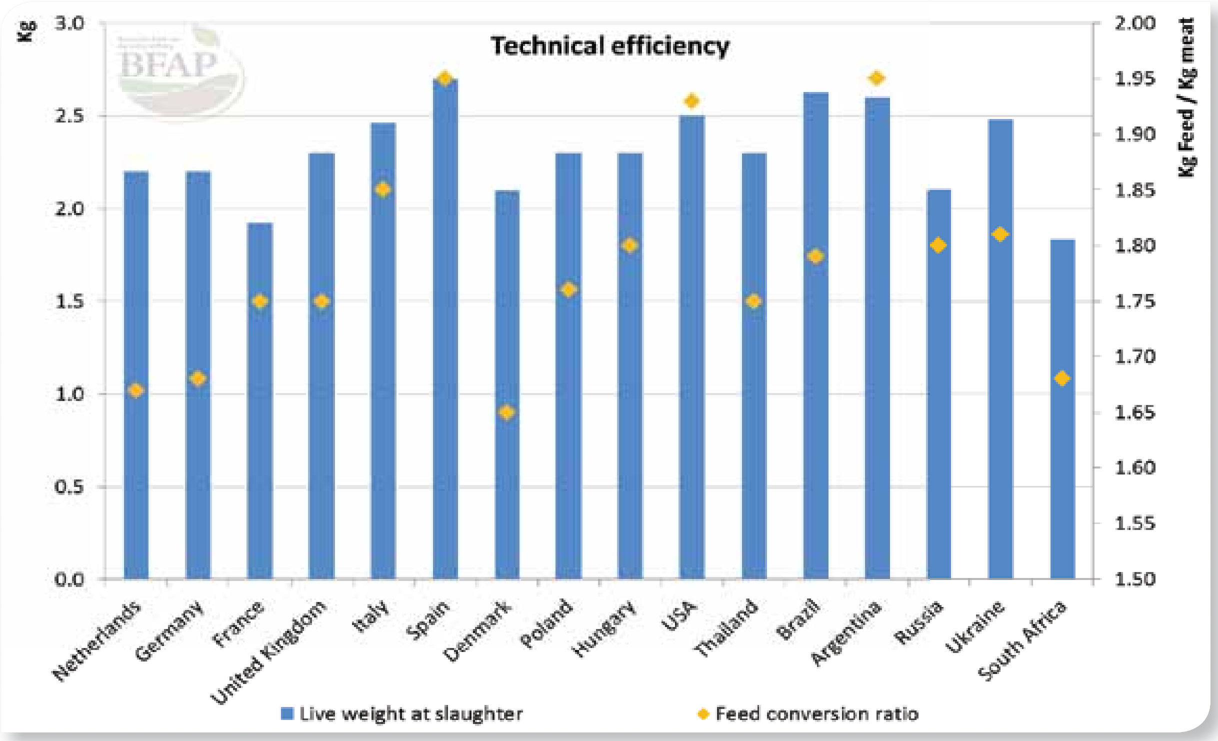


Figure 13.26: *Technical efficiency of South African producers in the global context*

Source: Van Horne & Bondt, 2014

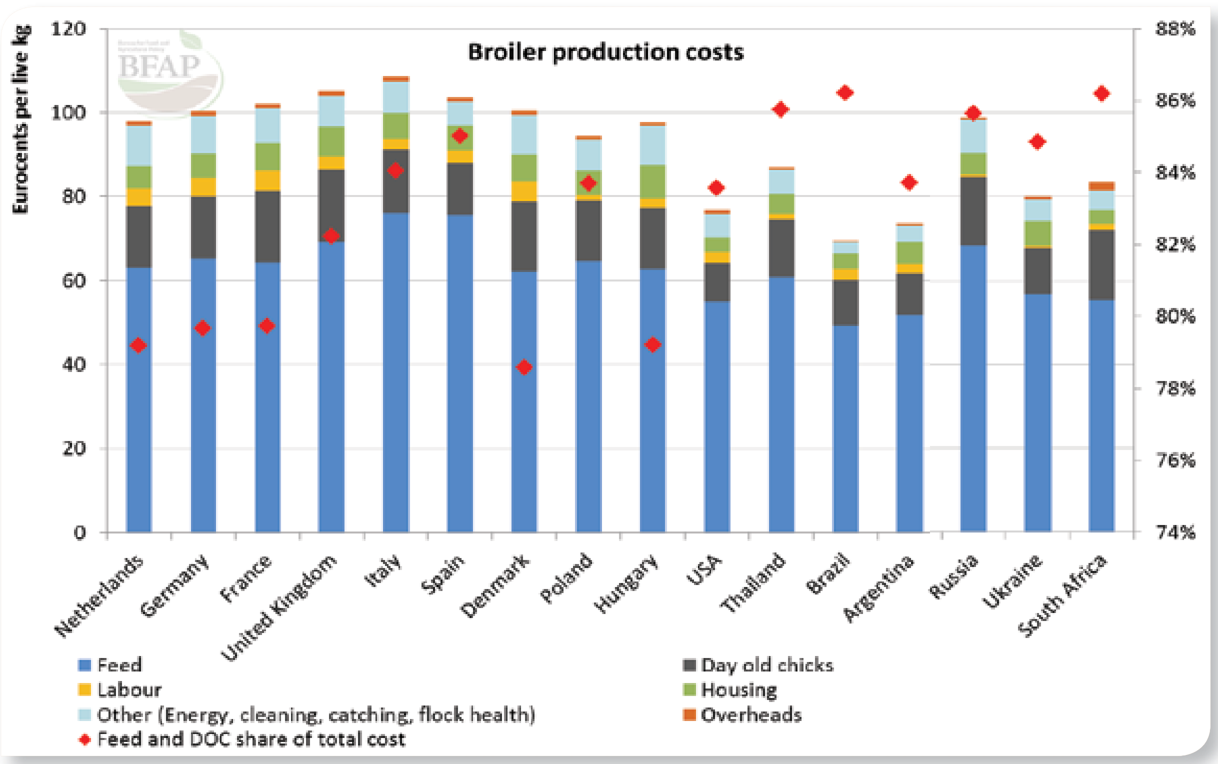


Figure 13.27: *Aggregate primary production costs in selected countries*

Source: Van Horne & Bondt, 2014

associated with feed and day old chicks was higher in South Africa than any other country in the sample, indicating that the rest of the required inputs are very cost competitive.

The figures presented are for a single production year only (2013) and consequently provide only a snapshot of South Africa's competitive position in the global context. Furthermore, 2013 was a particularly difficult year for broiler producers globally, due to sharp increases in feed grain prices that were not accompanied by equivalent increases in the price of chicken. Nevertheless, the results provide an indication of the drivers that influence South Africa's competitive position in the global broiler market.

Broiler producers in South Africa have been faced with significant uncertainty in 2015. Whilst meat to feed price ratios have turned in favour of broiler producers in the global market, domestic producers have been faced with persistently high feed costs arising from drought conditions in early 2015. Furthermore, concessions regarding the removal of anti-dumping duties on a quota of 65 thousand tons of chicken per annum imported from the US in June 2015 will allow competitively priced bone-in portions into the domestic market, impacting on local price levels (Box 8.1). Despite these factors, the baseline projections reflect a cycle of lower feed grain prices over the next decade: combined with relatively firm meat prices, profitability prospects within the chicken industry are therefore set to improve. The volatility experienced over the past 5 years is indicative of how quickly this can change in the face of drought conditions and consequently risk and uncertainty remains an integral part of the producer's decision making framework.

In this regard, Figure 13.29 relates the implications of the baseline projections to a prototype broiler producer, growing broilers on contract for an integrated holding company. The simulation was conducted stochastically, introducing volatility into the cost of feed and the broiler producer price, based on historic variations around the deterministic projections at sector level. The pricing structure employed within contracted production is maintained however, reducing the risk associated with diverging trends in feed and chicken prices. The prototype production unit presented in Figure 13.29 produces approximately 300 thousand chickens per cycle and maintains slightly above average technical efficiency parameters.

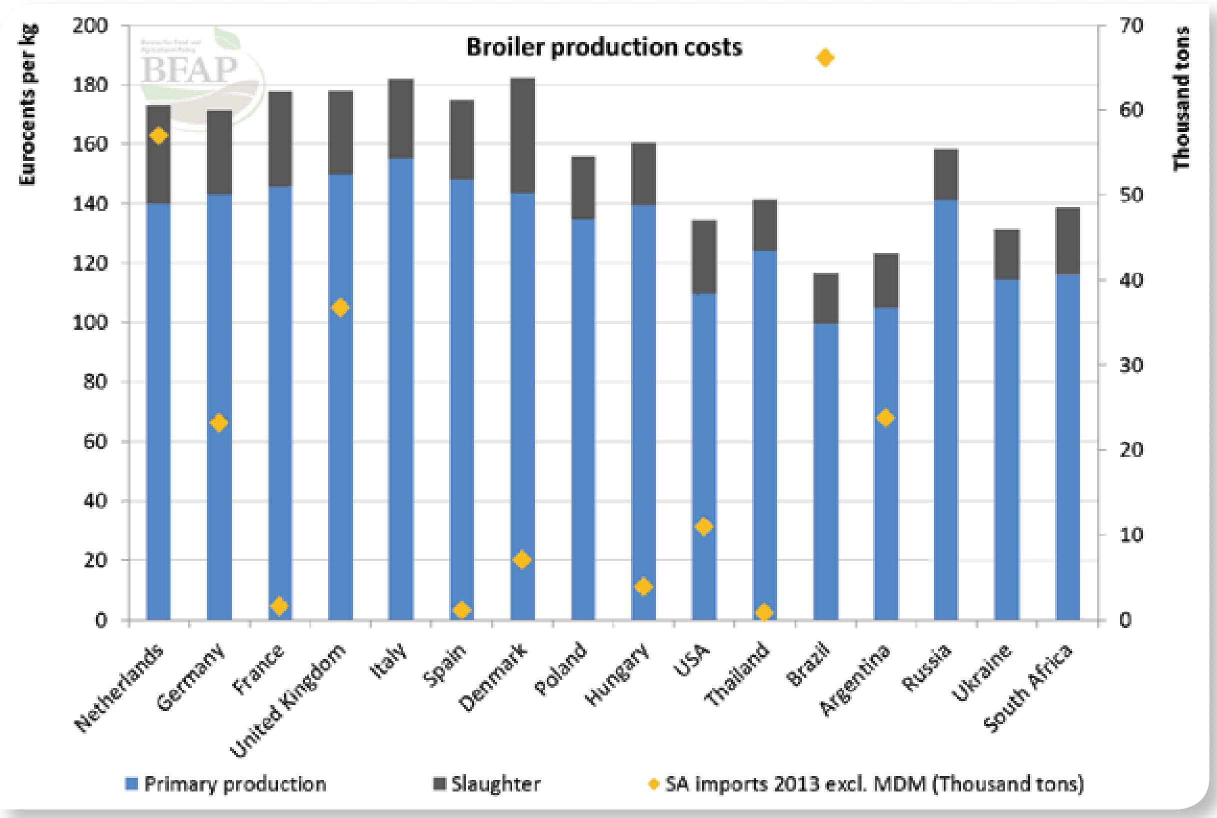


Figure 13.28: *Broiler production costs in selected countries and South African imports from these countries, 2013.*

Source: Van Horne & Bondt, 2014

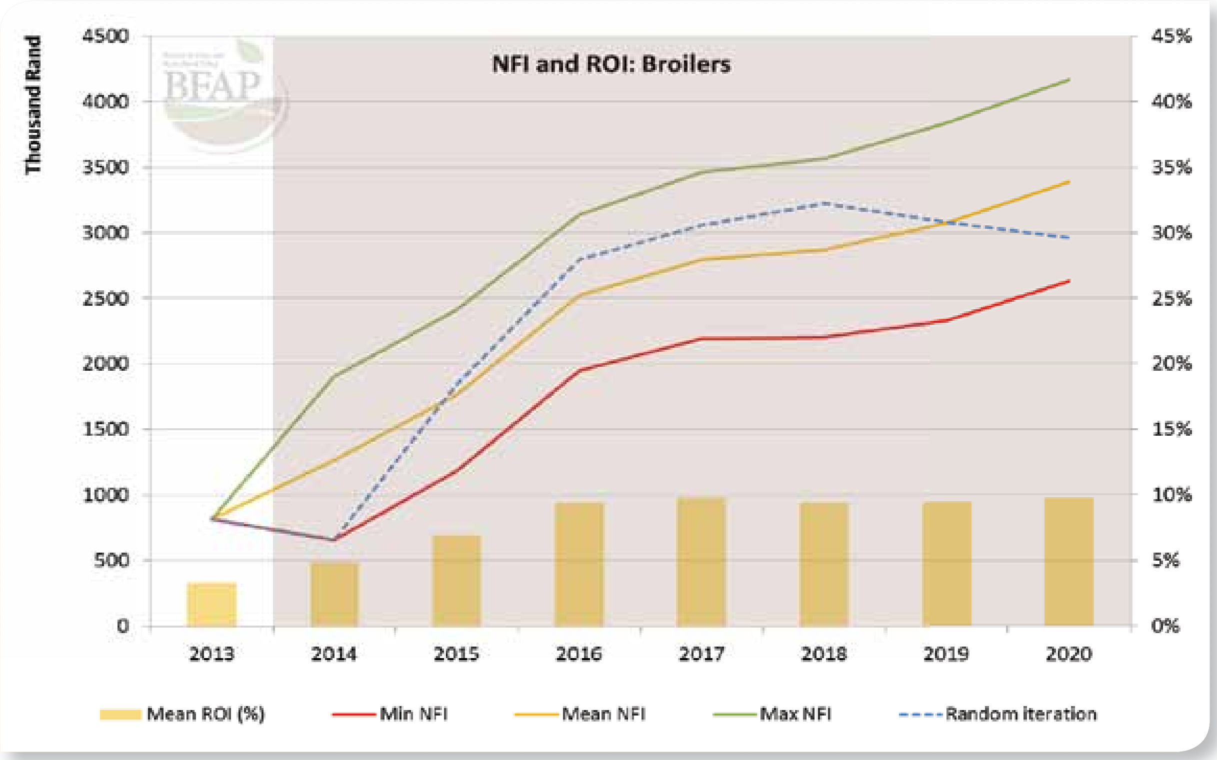


Figure 13.29: *Net Farm Income and Return on Investment on a prototype broiler production unit – contract producer*

Figure 13.29 indicates that, despite 2013 being a particularly challenging year for broiler producers, contract growers that were able to maintain above-average efficiency parameters could still maintain a small positive return. Naturally this depends on many factors and given the fact that the prototype producer depicted in Figure 13.29 only financed approximately one third of the chicken houses, producers with a less favourable financing structure may not have been able to maintain a positive return. It is important to note that the producer's remuneration has not yet been accounted for in the NFI, while land and fixed improvements must still be paid from this revenue. Furthermore, over the longer term, a return of approximately 5% will not be sufficient for producers to reinvest in chicken production given the associated risk structure. Over the outlook period however, this projected return improves to 10% by 2020.

The stoplight chart in Figure 13.30 pertains to the same contract producer and illustrates the probability of obtaining a ROI ranging from 8% to 11% from 2014 to 2020. The red bars illustrate the probability of an ROI below 8%, while the green bars illustrate the probability of obtaining an ROI higher than 11%. The yellow bars in the middle are indicative of a ROI between 8% and 11%.

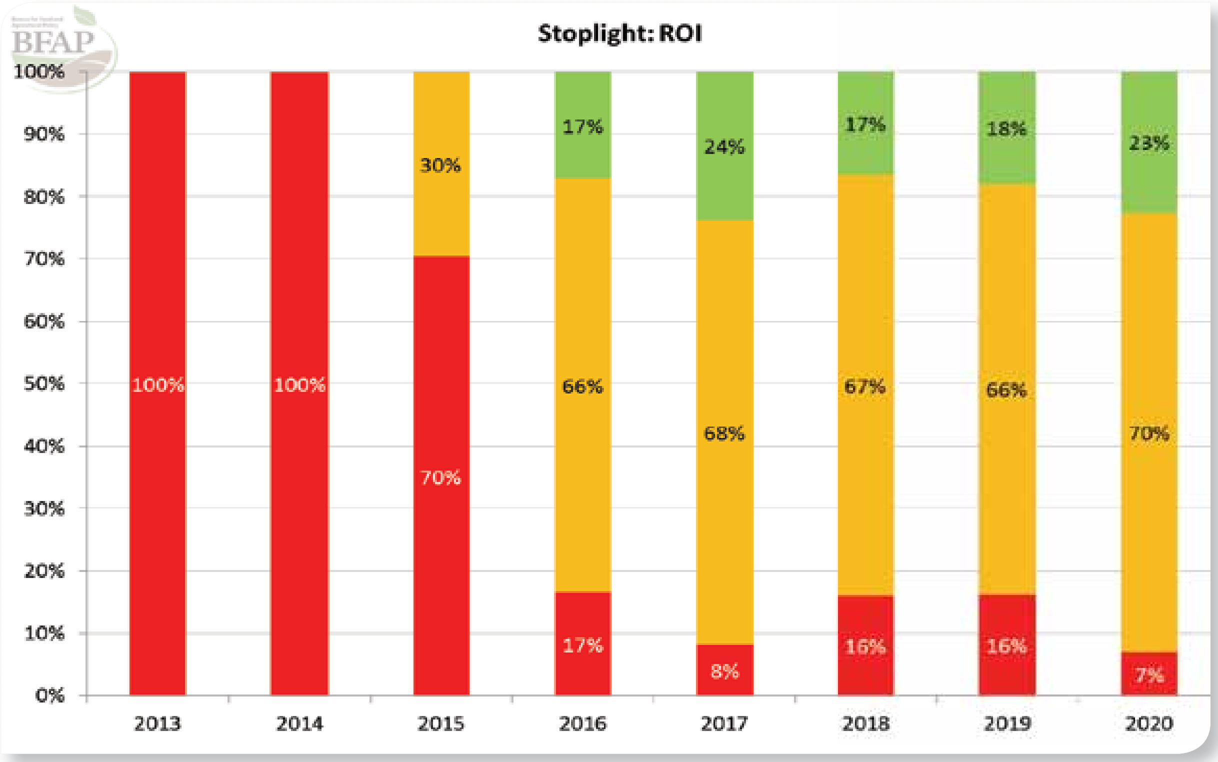


Figure 13.30: *Stoplight chart: Probability of obtaining a ROI between 8% and 11% on a prototype broiler production unit - contract producer*

Apple and pear production systems (Western Cape)

Apple and Pear producers operate in a particularly uncertain environment; whilst faced with continuous change such as dynamic technological innovations, exposure to international markets as well as changing national and international legislation and regulations, the long term nature of production allows little flexibility. The sustainability of pome farming systems will therefore be influenced by economically rational decision making and the ability to adapt to a changing environment. Not only technical efficiency (like irrigation scheduling, orchard design, etc.), but also strategic planning and innovative management are important to accommodate trends and drivers of change such as:

- Deciduous fruit farms are dependent on irrigation water and in future the total share of available water to agriculture is likely to decline. Climate change will have an effect on rainfall and temperatures. Thus the need for optimal irrigation efficiency.
- The ratio between the cost of labour and capital (like mechanical equipment) will influence employment patterns. The use of specific capital equipment, like mechanical platforms, can increase labour efficiency and productivity (Box 13.2).
- The largest share of pome fruit is exported and the exchange rate is an important driver in the profitability of these crops.
- Fruit production systems have to adhere to specific national and international food safety and environmental legislation and regulations, as well as to standards set by various local and international retailers (e.g. GLOBALG.A.P.).
- Education and training of farm workers is important, contributing to, amongst others, higher productivity, better communication and job satisfaction. Investment in quality training facilities and schools (on national and provincial level) will improve the quality of human capital.
- Plant density, tree shape, canopy management and orchard design can contribute to higher production and better quality fruit. The efficiency of activities like thinning, pruning and harvesting will also be influenced by these considerations.

- Netting for shade and / or hail protection could be considered in specific producing areas.
- To sustain long term fruit production capacity and to adjust to consumer preferences, orchard replacement schedules should be maintained.
- The way in which the National Development Plan (NDP) will unfold and materialise, and specifically the effect of the land reform policy and programmes, small farmer development and Agricultural Broad Based Black Economic Empowerment (AgriBBEE) will influence the structure, stability and prosperity of commercial deciduous fruit farmers. Lack of clarity related to various versions of possible land reform increases uncertainty and can affect the replacement strategies of orchards, employment patterns, food security and export potential of the country.

Implications of the Outlook projections for a prototype apple and pear farm

The FinSim farm level model is capable of analysing a given farm business and then projecting future performance for that business. The model is based on specific assumptions regarding various controllable parameters such as farm size (for evaluating amongst others the effect of economies of size), enterprise composition, up to 36 orchard blocks for apples and also for pears, each block with a variable replacement cycle, age of first bearing and full bearing, as well as variable annual yields, variable production practices, and variable input and product prices. Various categories or classes of output for apples and pears are provided for in the model to accommodate the different prices in the various market segments. The farm level model is linked to the sector level projections for the apple and pear industries, as well as the macro economic assumptions associated with the Baseline using indexes to respectively accommodate simulated projected cultivar prices and changes in the expected inflation rate for input prices, interest rates and other macro-economic variables.

This section includes an analysis of a prototype apple and pear farm based on the 2013/14 production and market information, as well as a simulation of the implication of the baseline projections on this prototype farm. These projections were simulated stochastically for the period 2015 to 2021. The description and characteristics of this prototype farm is based on Hortgro Services (2015) data, adjusted by a panel of farmers at a group discussion. This prototype farm therefore still relates to a specific set of assumptions (Tables 13.4 to 13.6) and is not considered representative of the entire apple and pear industry in South Africa. Whilst 2 different scenarios are included, the results and projections presented should not be seen as forecasts, but rather in the context of "... what, if ..." scenarios, given the relevant assumptions. The decision maker should be creative and pro-active in evaluating the effect of alternative actions and implement those actions that utilise opportunities and follow practices that contribute to a sustainable farming system.

The area and composition of apple and pear cultivars, as well as the respective full bearing yield for each cultivar produced on the prototype farm, are presented in Table 13.4. The area of each specific cultivar was further modelled into three blocks of different ages to ensure a representative age distribution of blocks over the specified lifespan of the orchards.

Table 13.4: Cultivar, area and yield on a prototype apple and pear farm (2013/14)

Cultivar:	Area		Yield (full bearing)
Apples:	**%**	**ha**	**(ton/ha)**
Granny Smith	10	12.0	65
Golden Delicious	23	27.6	80
Royal Gala	18	21.6	60
Pink Lady / Rosy Glow	15	18.0	80
Topred / Starking	15	18.0	60
Fuji	12	14.4	70
Braeburn	2	2.4	85
Sundowner	3	3.6	80
Jazz / Kanzi	2	2.4	45
Total	**100**	**120.0**	

Table 13.4: Cultivar, area and yield on a prototype farm apple and pear farm (2013/14) (continued)

Cultivar:	Area		Yield (full bearing)
Pears:	**%**	**ha**	**(ton/ha)**
Packham's Triumph	35	10.5	70
Forelle	40	12.0	45
Bon Chretien	6	1.8	55
Abate Fetel	10	3.0	55
Beurre Bosc	3	0.9	60
Doyenne du Comice	3	0.9	45
Rosemarie / Cheeky	3	0.9	50
Total	**100**	**30.0**	
Total cultivated area		**150**	

For both apples and pears, the total yield per cultivar is further divided into various market segments, with corresponding 2014 prices per market segment, as indicated in Table 13.5. These prices are farmgate (net) prices and assume a situation where the packaging of the fruit is undertaken off-farm.

Table 13.5: Market segmentation and farmgate prices on a prototype apple and pear farm (2013/14)

Cultivar	Market segment (% of yield)			Price in R/ton (farm gate price)		
Apples:	**Export**	**Local**	**Processing**	**Export**	**Local**	**Processing**
Granny Smith	40	30	30	4 500	2 200	1 100
Golden Delicious	55	27	18	5 000	2 800	1 100
Royal Gala	65	20	15	5 000	2 500	1 100
Pink Lady / Rosy Glow	50	30	20	7 500	2 700	1 100
Topred / Starking	20	65	15	5 000	4 000	1 100
Fuji	55	20	25	6 500	2 800	1 100
Braeburn	50	10	40	4 500	1 600	1 100
Sundowner	60	20	20	8 000	5 500	1 100
Jazz / Kanzi	55	25	20	6 500	2 500	1 100
Pears:	**Export**	**Local**	**Processing**	**Export**	**Local**	**Processing**
Packham's Triumph	50	25	25	4 500	3 000	1 000
Forelle	60	22	18	5 500	3 000	1 000
Bon Chretien	30	50*	20	3 800	2 800*	1 000
Abate Fetel	55	27	18	5 500	2 000	1 000
Beurre Bosc	50	30	20	4 000	1 600	1 000
Doyenne du Comice	60	15	25	5 000	1 600	1 000
Rosemarie / Cheeky	50	30	20	5 500	2 000	1 000

*Canning

Table 13.6 explicitly states the assumptions related to the production practices and assumed production cost for the prototype farm. The specified directly allocable variable costs exclude packaging cost.

Performance of the prototype apple and pear farm over the projection period is illustrated by various measures. For each year, nominal values are simulated stochastically over 1000 iterations, allowing for the calculation of minimum, mean and maximum values, as well as the probability distributions of these performance measures. Selected results are illustrated in Figures 13.31-13.35.

The mean simulated annual gross margin, calculated as the gross production value minus the directly allocable variable costs per ha for apples and pears, are presented in Figure 13.31. It is evident that the gross margins obtained for apples were higher than that of pears over the entire projection period. The differences in the shape, trend and absolute value of the simulated gross margins are attributed to differences in cultivar composition, age of orchard blocks, the assumed yields of the various cultivars of apples and pears and the market and price structure of the various cultivars on this prototype farm. The decline in the gross margin for apples in 2020 and 2021 is not due to a projected decline in nominal prices, but can be ascribed to the other factors mentioned, such as orchard replacements.

Net farm income (NFI) is a performance measure used in profitability assessment and represents the reward to capital, land and the entrepreneur. All other cost items are thus deducted from the gross farm income, except for interest paid on borrowed funds, interest earned on own capital, land rent, land lease and entrepreneurial remuneration. A negative NFI thus implies that the three production factors, namely land, capital and entrepreneurial input receive no reward. The maximum, mean and minimum simulated annual NFI per ha are illustrated in Figure 13.32, which illustrates the range between which the different iterations of the simulated NFI figures varied for each specific year. The general trends tend to follow the projected gross margin for apples presented in Figure 13.31, which is attributed to the fact that apples represent the main enterprise in this prototype farm (120 ha apples compared to 30 ha of pears).

Table 13.6: Assumptions related to apple and pear production practices and costs on a prototype apple and pear farm (2013/14)

Characteristic	Apples	Pears
Age of first bearing (year)	3	4*
Age of full bearing (year)	7	9**
Replacement age (years)	30	30
Establishment cost (R/ha)	266 536	253 861
Directly allocatable variable cost (excluding packaging) (R/ha)	111 548***	93 689***
Fixed and other variable cost for this prototype farm (including permanent labour) (R)	7 776 875****	

* Bon Chretien, Beurre Bosc and Packham's Triumph year 3
** Bon Chretien, Beurre Bosc and Packham's Triumph year 8
*** full bearing
**** excluding interest on capital, land rent and entrepreneurial remuneration

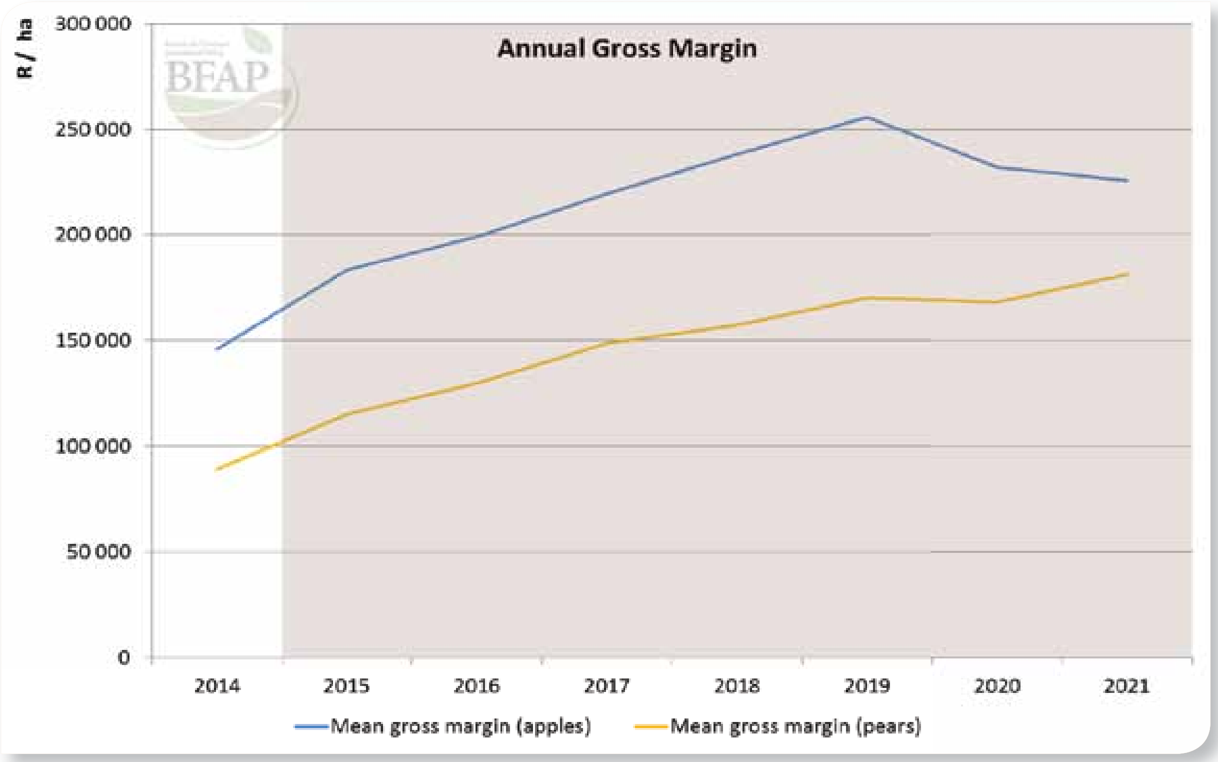


Figure 13.31: *Mean simulated annual gross margin per hectare for apples and pears*

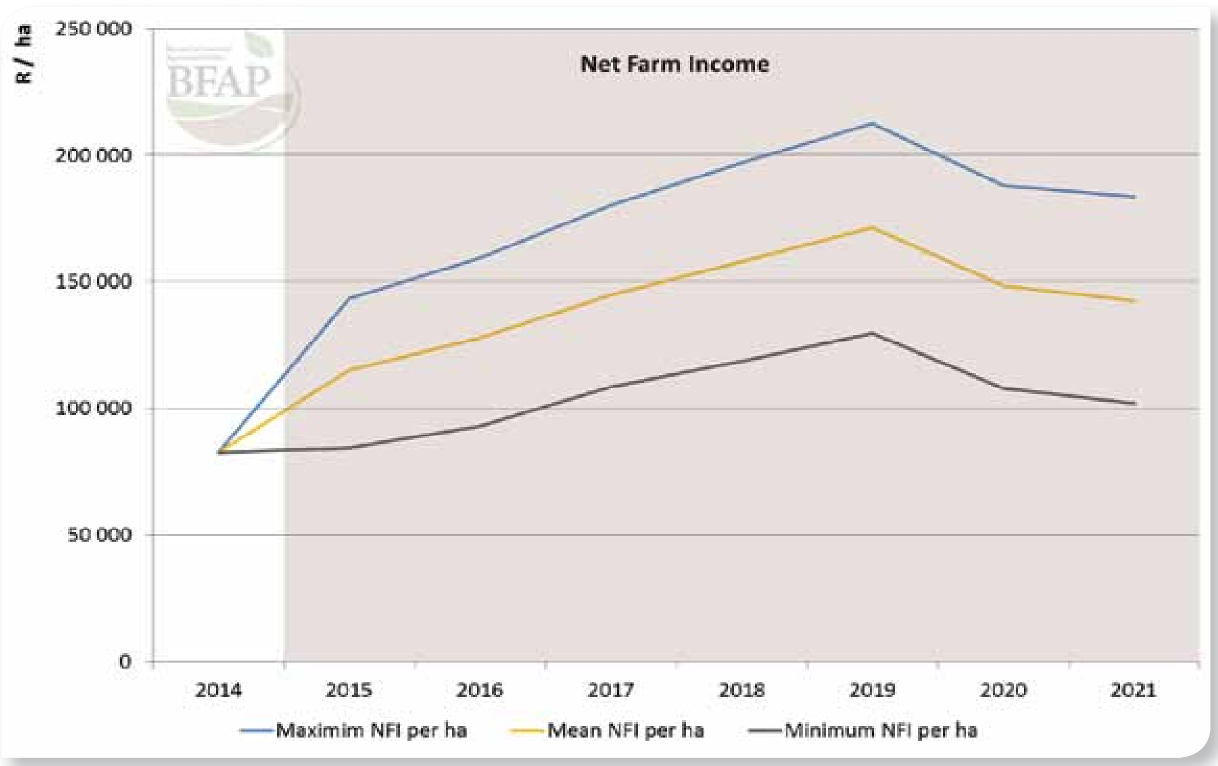


Figure 13.32: *Maximum, mean and minimum simulated annual net farm income (NFI) per hectare*

In light of the range of possible NFI levels presented in Figure 13.32, the probabilities that the annual NFI per ha for the prototype apple and pear farm fall within a specified range of between R120 000 and R150 000 per hectare are illustrated in Figure 13.33. The green bars illustrate the probability of attaining a NFI of more than R150 000 per hectare, whilst the red bars reflect the probability of attaining a NFI of less than R120 000 per hectare. The yellow bars in turn represent the probability of obtaining a NFI of between R120 000 and R150 000 for the specified period.

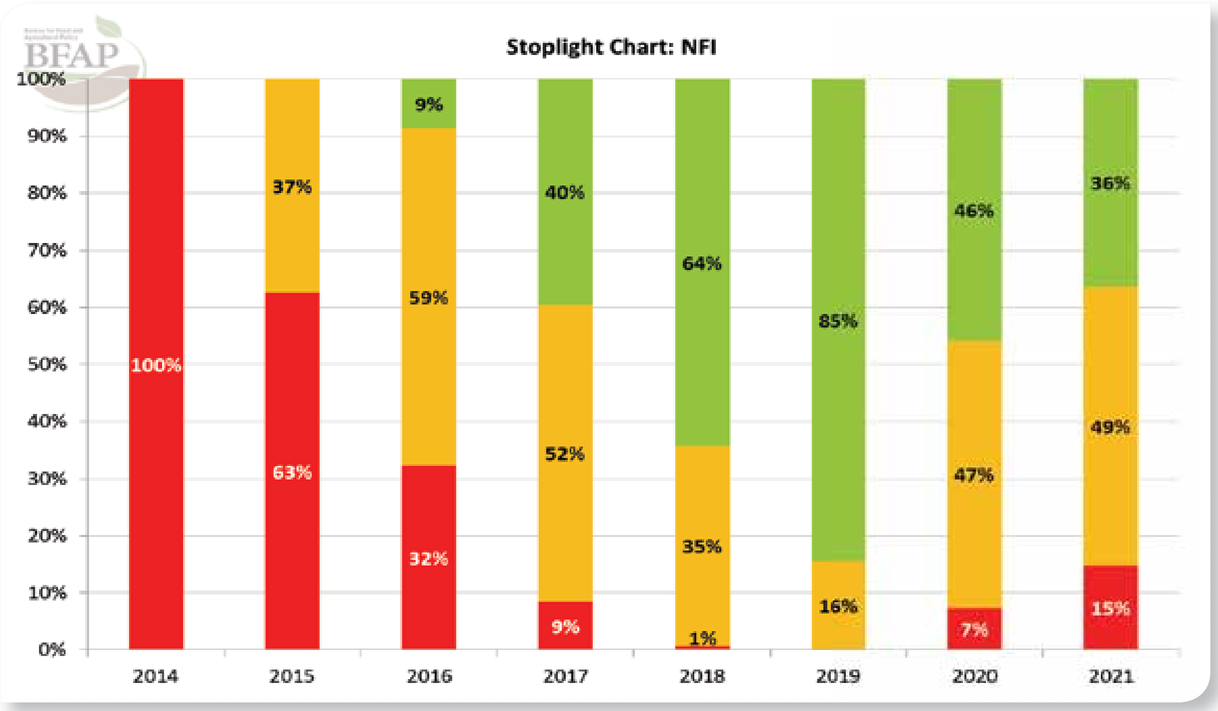


Figure 13.33: *Probability of obtaining a NFI of between R120 000 and R150 000 per hectare.*

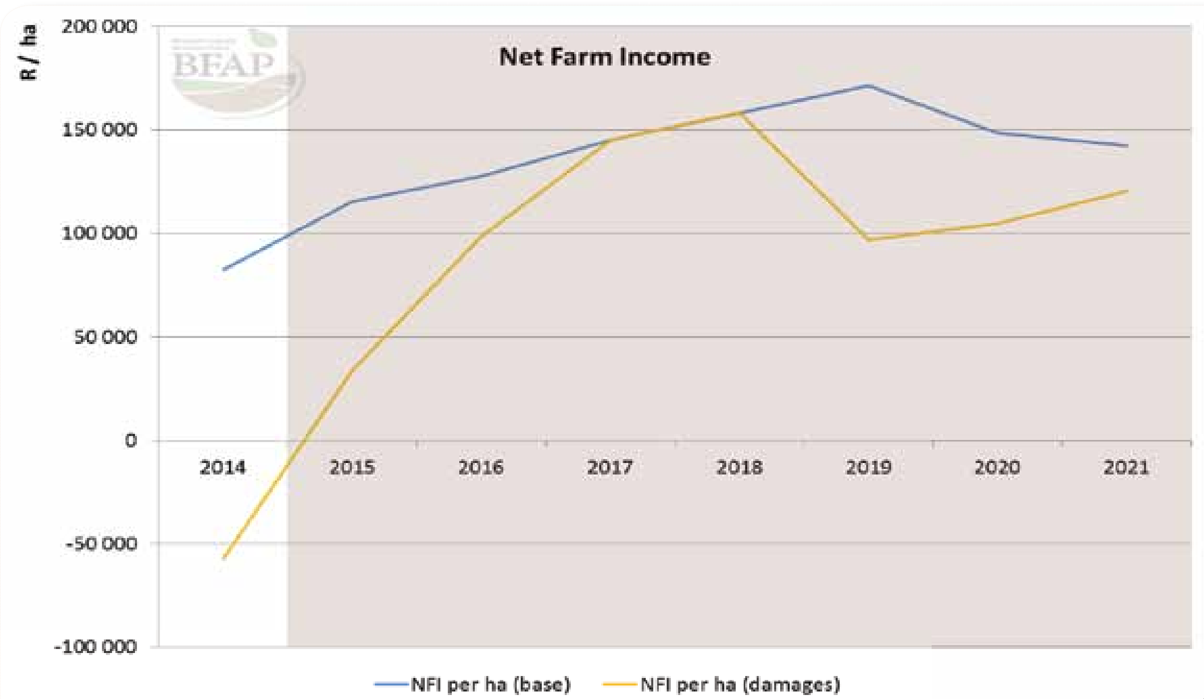


Figure 13.34: *Mean simulated annual net farm income (NFI) per hectare for the baseline, as well as a scenario of hail and frost damages.*

The mean simulated NFI would be associated with normal weather conditions and while the stochastic analysis accounts for some variation in yield levels in the range presented, the impact of specific climatic occurrences such as variability in rainfall, hail, frost and floods are not explicitly modelled. Consequently a situation was simulated where a hail storm was assumed in 2014, with frost appearing in 2019. The effect of the hail damage was assumed to be 60%, 30% and 10% on income in 2014, 2015 and 2016 respectively. The price effect will only be in the actual year when the hail storm appears, but the yield effect will be for two more years after the actual damage to the 2014 crop. The effect of the frost damage will only be on the yield (not on price) and was assumed to be 20%, 12% and 6% on income in 2019, 2020 and 2021 respectively. The results of this scenario (hail damage 2014 and frost damages in 2019) in comparison with the baseline situation are presented in Figure 13.34. In this scenario, the NFI would be negative in 2014 when the hail damage occurs, implying not only that there would be no reward to capital, land and the entrepreneur, but also that all costs will not be covered.

Given that the specified scenario was still simulated stochastically to provide a range of possible outcomes, Figure 13.35 presents the probability distribution of obtaining the same NFI levels presented in Figure 13.33 under the scenario of hail and frost damage. Comparing the results in Figures 13.33 and 13.35, the impact of the hail and frost is clear. It is only in 2017 and 2018 that the simulated NFI per ha will be comparable. The NFI in 2014 and 2015 did not exceed R120 000 per hectare in any of the iterations, while the probability of exceeding R120 000 per hectare in 2019 and 2020 remained below 25%, due to the negative impact of frost damage in 2019. In interpreting the results, it should be considered that the data presented in the analyses is nominal values and that the probability boundaries set in Figures 13.33 and 13.35 remain fixed in absolute value over the projection period.

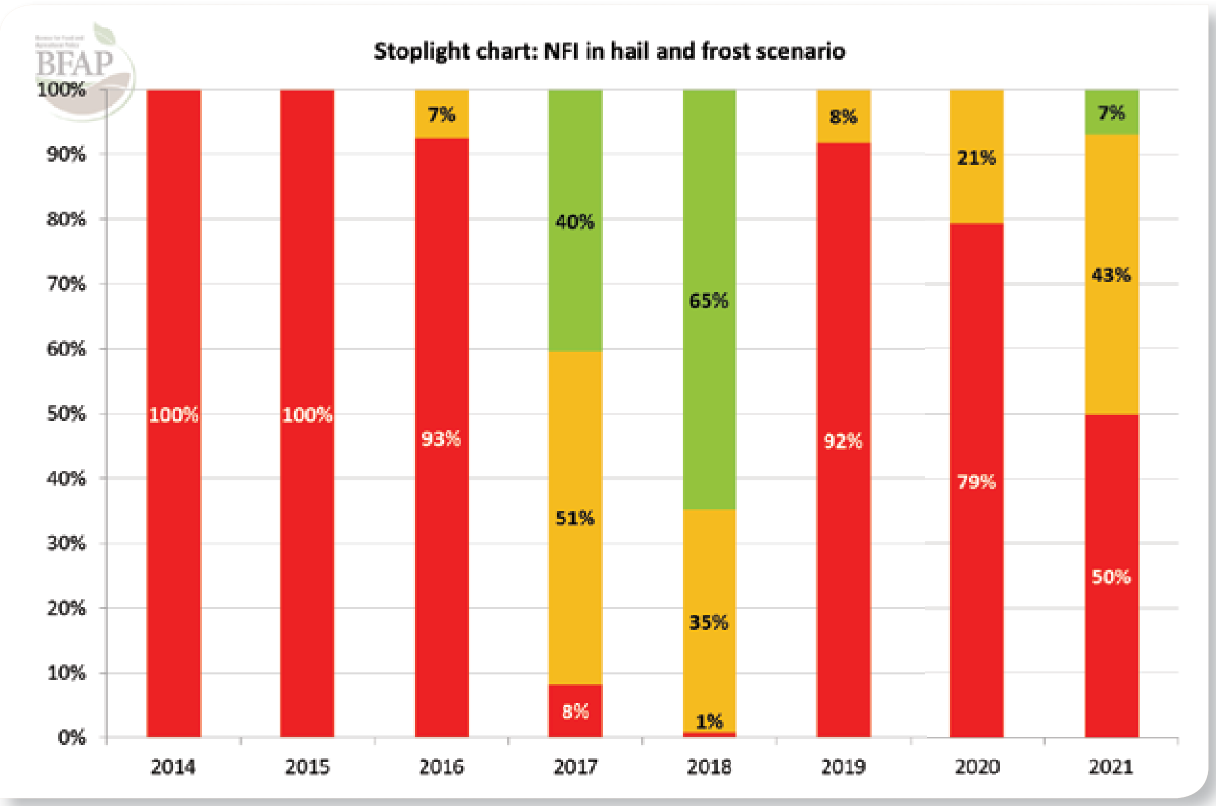


Figure 13.35: *Probability of obtaining a NFI of between R120 000 and R150 000 per hectare under a scenario of hail and frost damage.*

agri benchmark Horticulture: Performance in the global context

As part of the BFAP farm level program, two prototype apple farms in South Africa are included in the agri benchmark Horticulture network. These farms are situated in the Ceres (100 ha) and EGVV (Elgin, Grabouw, Vyeboom and Villiersdorp) (80 ha) regions. The cultivar composition and full bearing yields of these farms are presented in Table 13.7.

Figures 13.36, 13.37 and 13.38 presents some of the agri benchmark Horticulture results for participating countries. Figure 13.36 illustrates the average yield per hectare and gross revenue per ton for the prototype farms included in the network. The sizes of the respective prototype farms are also listed in the figure and differ widely, with only one German and the two South African prototype farms that are relatively large and therefore offer comparable average yields. The average yields obtained on the two South African prototype farms were considerably higher for the 2013 harvest. The gross revenue per ton on the South African prototype farms was considerably lower over the period 2010-2013 than for the European countries.

Some of the variable input cost components for the prototype apple farms are illustrated in Figure 13.37. The lowest specified input cost per ha was achieved on the larger prototype apple farm in Chile, while the highest specified cost per ha was on the small prototype farm in Switzerland. The specified input cost per ha on the other prototype farms varied within a smaller range. The cost of insecticides was relatively higher for the two South African prototype farms, while the cost of fungicides was lower on these two prototype farms than on some of the other regions.

The wage rates, efficiency of labour and labour productivity for the prototype farms that were able to supply the necessary detail are presented in Figure 13.38. The South African prototype farms used mainly hired labour, but were labour inefficient in terms of hours per hectare. The wage rate for hired labour on the South African prototype farms was considerably lower than for the European countries. The labour productivity (value of output / labour hours) for the two prototype apple farms in South Africa was considerable lower than their European counterparts.

Table 13.7: Area, cultivar and yields for 2 prototype South African apple farms included in the agri benchmark initiative

	Area (%)		Yield (full bearing)	
Production region	**Ceres**	**EGVV**	**Ceres**	**EGVV**
Cultivar:	**%**	**%**	**(ton/ha)**	**(ton/ha)**
Granny Smith	13	21	85	80
Golden Delicious	22	25	84	90
Royal Gala	15	14	73	65
Pink Lady / Cripps Pink	15	10	85	90
Topred / Starking	19	10	51	60
Fuji	11	10	90	72
Braeburn	5	5	100	75
Sundowner	0	5	N/A	90
Total	**100**	**100**		

EGVV --- Elgin, Grabouw, Vyeboom and Villiersdorp
N/A --- not applicable

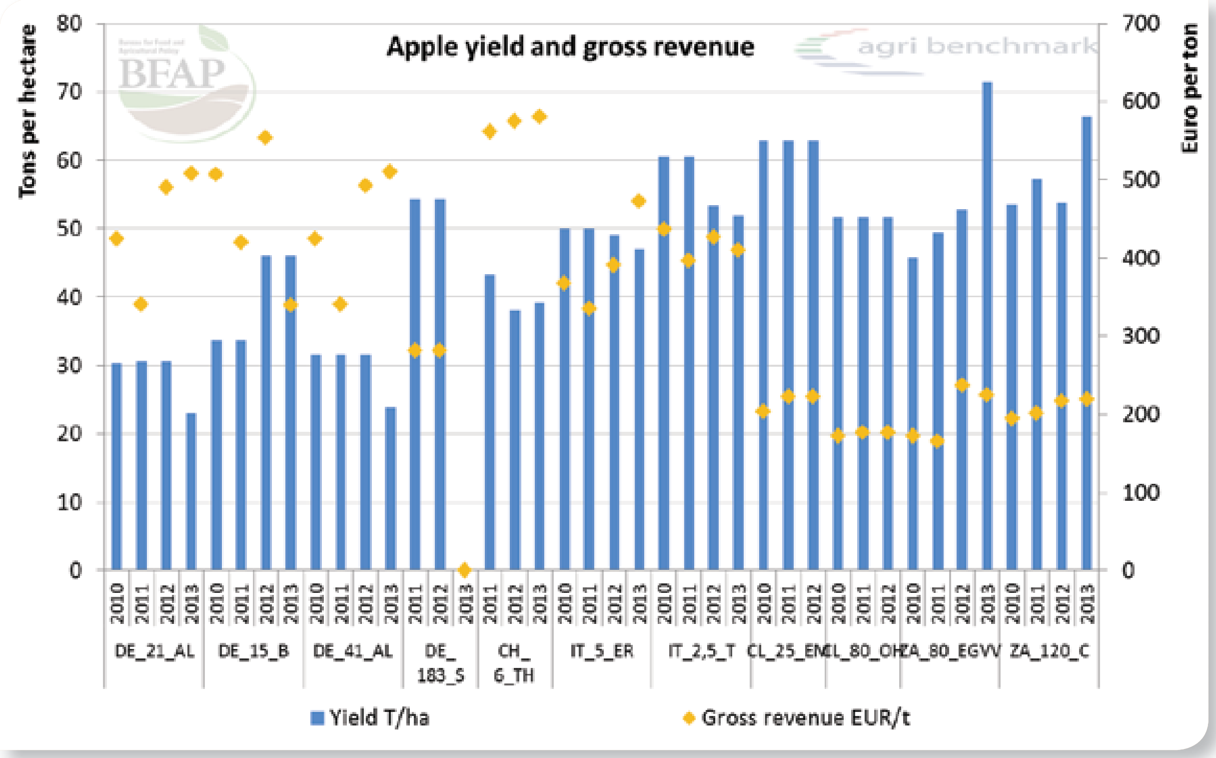


Figure 13.36: *Yield (ton/ha) and gross revenue (€ per ha) for apples (2010 – 2013) on various prototype farms in Germany (DE), Switzerland (CH), Italy (IT) and South Africa (ZA)*

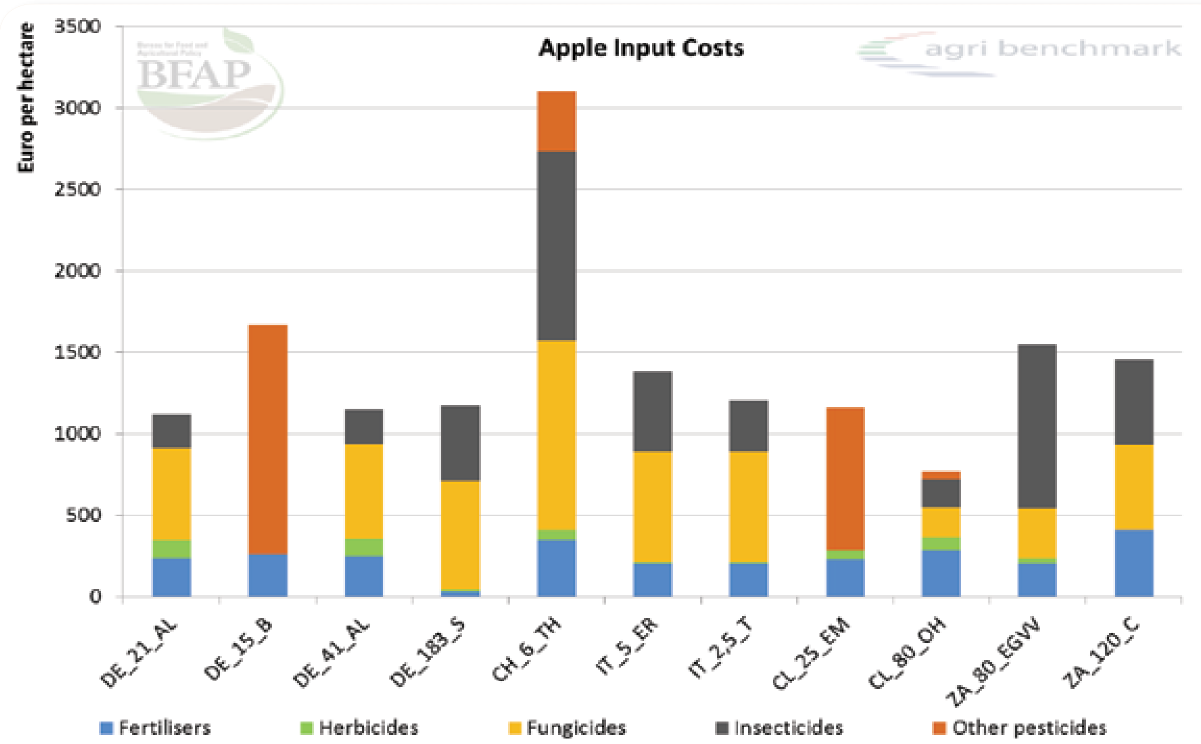


Figure 13.37: *Input costs for apples (2013) on various prototype farms in Germany (DE), Switzerland (CH), Italy (IT), Chile (CL) and South Africa (ZA)*

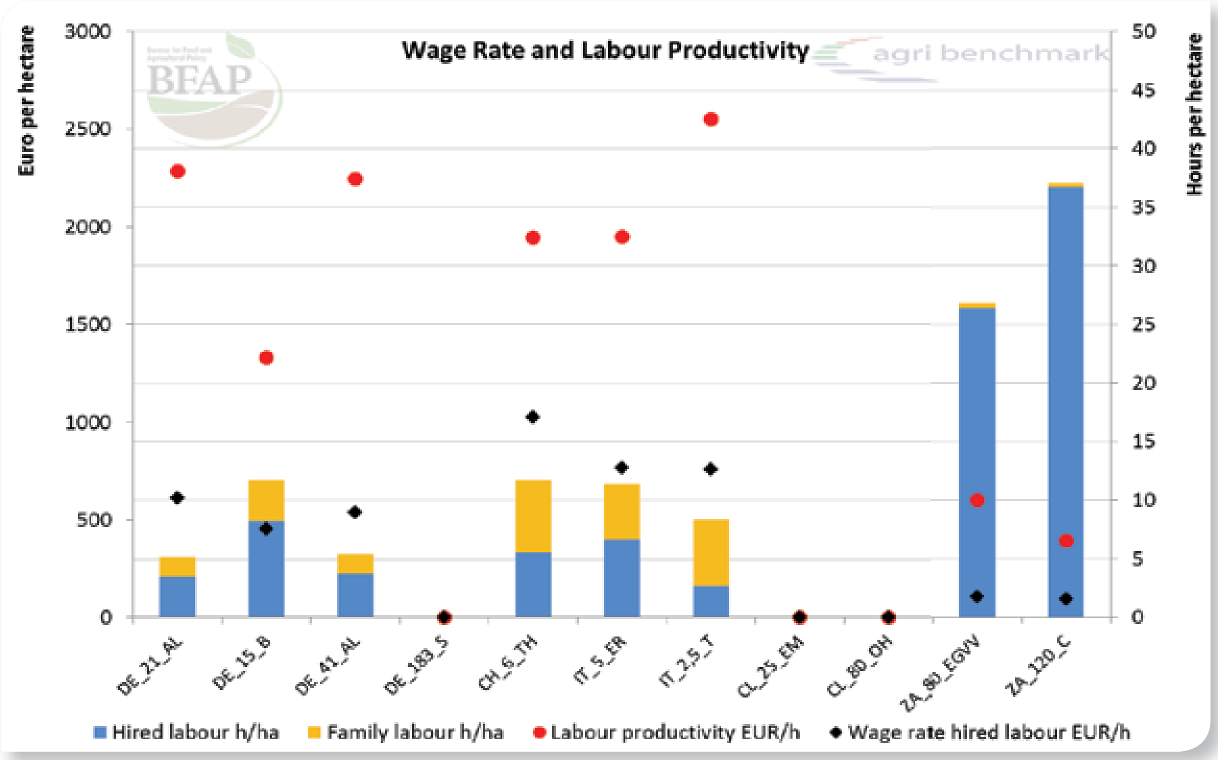


Figure 13.38: *Wage rates and labour productivity on selected apple farms in Germany (DE), Switzerland (CH), Italy (IT), Chile (CL) and South Africa (ZA)*

Box 13.2: Mechanical equipment and labour productivity in deciduous fruit production

The labour intensity of deciduous fruit production constantly drives producers to seek ways to improve labour productivity and effectiveness in orchards. Recent research showed that by using mechanical equipment such as labourer platforms and by optimizing the processes and practices used on the farm, producers can achieve significant gains in labour productivity for certain aspects of deciduous fruit production. Research showed that with labourer platforms and harvesting systems:

- There is no gain in labourer productivity when harvesting apples and pears
- Apple thinning productivity was increased by between 0% to 40%
- Apple and pear dormant pruning productivity was increased by between 15% and 60%
- Apple summer pruning was increased by up to 300%

The conventional picking action (physical removing of the fruit from the tree) is already efficient. Inefficiencies related to conventional harvesting are caused by the climbing and moving of ladders, as well as by walking to and from bulk bins to empty harvesting bags. Labourer platforms and harvesting systems eliminated these inefficiencies to some extent, but created other inefficiencies due to misalignments between machine and orchard design, as well as labour team related issues, resulting in similar harvesting productivities as conventional harvesting.

Actions with a small amount of work per ladder placement, e.g. summer pruning, showed the largest gains in labourer productivity. Thus in order to maximize the productivity gains achieved with the use of labourer platforms, pruning strategies should be simplified as far as possible, i.e. fewer cuts per tree. In doing so the amount of time spent moving the ladder in the orchard increases relative to the amount of time spent working on the ladder. The replacement of the ladder with a labourer platform will therefore result in the labourers gaining much more time to prune as opposed to climbing ladders. It will be difficult to implement the same principle on thinning and harvesting strategies, which will likely remain labour intensive actions in the deciduous fruit production process. Considered together with the fact that many South African apple and pear orchards are not suitable for the use of labourer platforms, investment in human capital remains important to increase overall farm productivity and efficiency in the short term. Producers should focus on improving management, labourer team and motivational strategies in order to optimize the practices and systems currently employed on farms.

Table 13.8 provides an indication of the potential gains to be unlocked from more efficient conventional apple harvesting practices. Three different scenarios are illustrated with regard to harvesting productivities in three different apple industries. The first scenario is the actual figures retrieved for the three apple industries. The United States of America (USA) has the highest productivity levels, with Europe (EU) coming in second and South Africa (SA) in third place. It should be noted that both the USA and EU produce larger apples than SA. This has a profound effect on harvesting productivity as illustrated in scenario 2, where the EU and SA fruit masses were set at the USA level with all the other parameters remaining the same. A 60% increase in harvesting output is evident in SA. Similarly, in scenario 3, picking rate (fruit min.-1) for EU and SA were set at the USA level, with all the other parameters remaining the same. A 108% increase in harvesting output is evident in SA. Though this is a simple theoretical exercise and the increases revealed in this comparison are likely to be influenced by a myriad of other factors in practice, an indication is provided as to the extent of harvesting productivity gains that can be achieved by optimizing conventional harvesting practices without the use of mechanical equipment. Such optimization might include the growing of more labourer friendly trees, individual labourer motivation, and production of larger fruit, achieving cropping uniformity on trees and investing in the lives and training of labourers on the farm. The solutions are however likely to be site specific, with no default answer for all situations.

Table 13.8: Potential gains from efficient conventional harvesting practices

Country	Fruit mass (g)	Harvesting rate (kg·hour^{-1})[1]	Picking rate (fruit min.$^{-1}$)[2]	360 kg bins per 9.5 hour workday[3]
Scenario 1: Fruit min.-1 achieved with conventional harvesting ("Industry figures")				
USA	240	389	27	10.3
EU	190	137	12	3.6
SA	150	117	13	3.1
Scenario 2: Average fruit mass set at USA level				
USA	240	389	27	10.3
EU	240	173	12	4.6
SA	240	187	13	4.9
Scenario 3: Fruit min.-1 set at USA rate				
USA	240	389	27	10.3
EU	190	308	27	8.1
SA	150	243	27	6.4

1 The mass of fruit harvested in one hour

2 Picking rate is defined as the number of fruit of a certain mass that needs to be picked per unit of time in order to achieve the specified harvesting rate

3 Fruit are usually harvested into 360 kg bulk bins and the number of bins filled in a day serves as a method of comparison

South African Outlook

THE BFAP HEALTHY FOOD BASKETS

Inadequate household income is a major contributor to food insecurity among economically marginalised households in South Africa. These households are highly dependent on purchased food, due to factors such as a lack of land, capital and tools, livestock, literacy and other formal skills

Introduction

Inadequate household income is a major contributor to food insecurity among economically marginalised households in South Africa. These households are highly dependent on purchased food, due to factors such as a lack of land, capital and tools, livestock, literacy and other formal skills. For example the FIVIMS (Food Insecurity and Vulnerability Information Management System) Sekhukhune study (FIVIMS, 2006) revealed that more than half of all households (54%) indicated that their households ran out of money to buy food, household members skipped meals due to a lack of food (53%) and children eating less than they needed due to a shortage of food (51%). Furthermore the variety of foods available to marginalised households is also limited. Their reliance on purchased food, coupled with inadequate household income levels also expose households to inflation and food price shocks.

'Food poverty' can be described as a situation where the amount spent on food by a household is inadequate to purchase a particular nutritionally balanced, low-cost food plan or 'food basket'. A 'Healthy' / 'Nutritious' food basket approach can be defined as a survey tool that is a measure of the cost of basic healthy eating that represents current nutritional recommendations, as well as average food purchasing patterns. This approach is usually applied to measure food affordability. A 'Typical' food basket approach is more closely related to consumers' actual food purchasing behaviour, even though it might not be at the level of ideal nutritional recommendations.

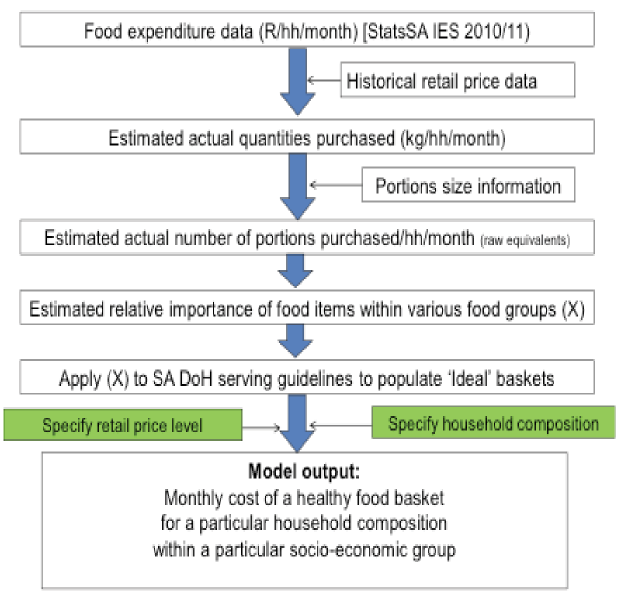
A healthy food basket applied to monitor food affordability should ideally adhere to certain requirements, such as:

- Be based on current nutritional recommendations, i.e. in the South African context it should ideally be based on the official Food Based Dietary Guidelines for South Africa as set out by the Department of Health – covering a comprehensive range of food groups: staples, animal proteins, dairy, fats/oils, legumes, fruit, vegetables, sugary foods.
- Take average food purchasing patterns into consideration to ensure that the basket also reflects the actual behaviour of consumers to a certain degree, e.g. food expenditure patterns of South African households according to the Statistics South Africa Income and Expenditure Surveys (StatsSA IES).
- Should be based on 'official' retail price data sources that are available at regular intervals (e.g. official food prices monitored by Statistics South Africa).
- Consider a range of socio-economic sub-groups, but in particular the more vulnerable lower-income share of the population.

In the South African context there are some food baskets applied to monitor food affordability, such as the food basket reported quarterly by the National Agricultural Marketing Council (NAMC) (compiled by the Food Price Monitoring Committee in 2003) and the Pietermaritzburg Agency for Community Social Action (PACSA) food basket. However, these baskets were not designed to be an indication of a nutritionally complete basket, but rather a reflection of what people are buying or stated differently, a selection of widely consumed food items.

The main objective of the analyses presented in this chapter is to monitor trends in the affordability of a healthy monthly food basket for individuals as well as typical households among marginalised consumers and lower-middle income consumers in South Africa, where the compiled food baskets reflect examples of eating patterns as recommended by the Department of Health (DoH). The comparison of the cost of these nutritionally balanced food baskets with individual or household income levels can shed further light on the affordability of food. Finally the impact of food price shocks on food affordability can be investigated by combining the commodity price outlook generated by the BFAP sector model with food retail price transmission values to simulate changes in the cost of the various nutritionally balanced monthly food baskets.

Methodology overview



Composition of the BFAP healthy food baskets

The composition of the two monthly BFAP healthy food baskets is presented in Figures 14.1 and 14.2, which illustrates the food group composition of these baskets for a family of four marginalised consumers. In the more affordable monthly healthy eating plan, starchy foods have the largest contribution (30%), followed by bean products (up to 19%), animal protein

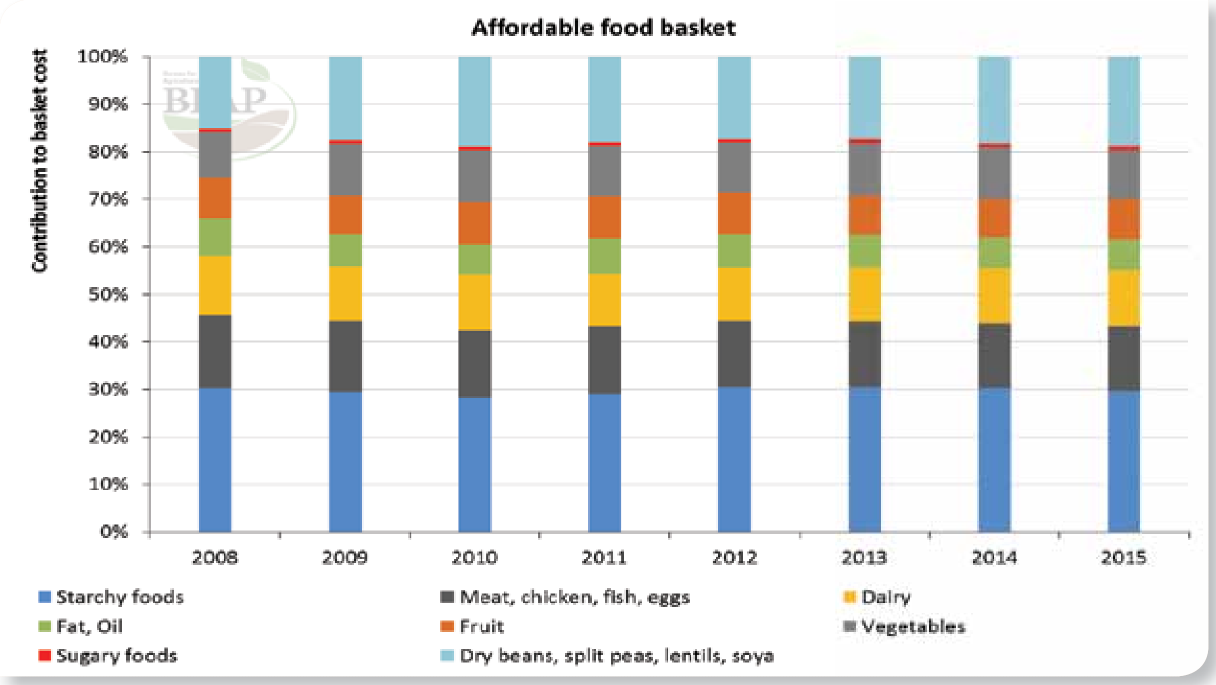


Figure 14.1: *The more affordable BFAP healthy food baskets for marginalised consumers – Average contribution of food groups to basket cost 2008 to 2015*

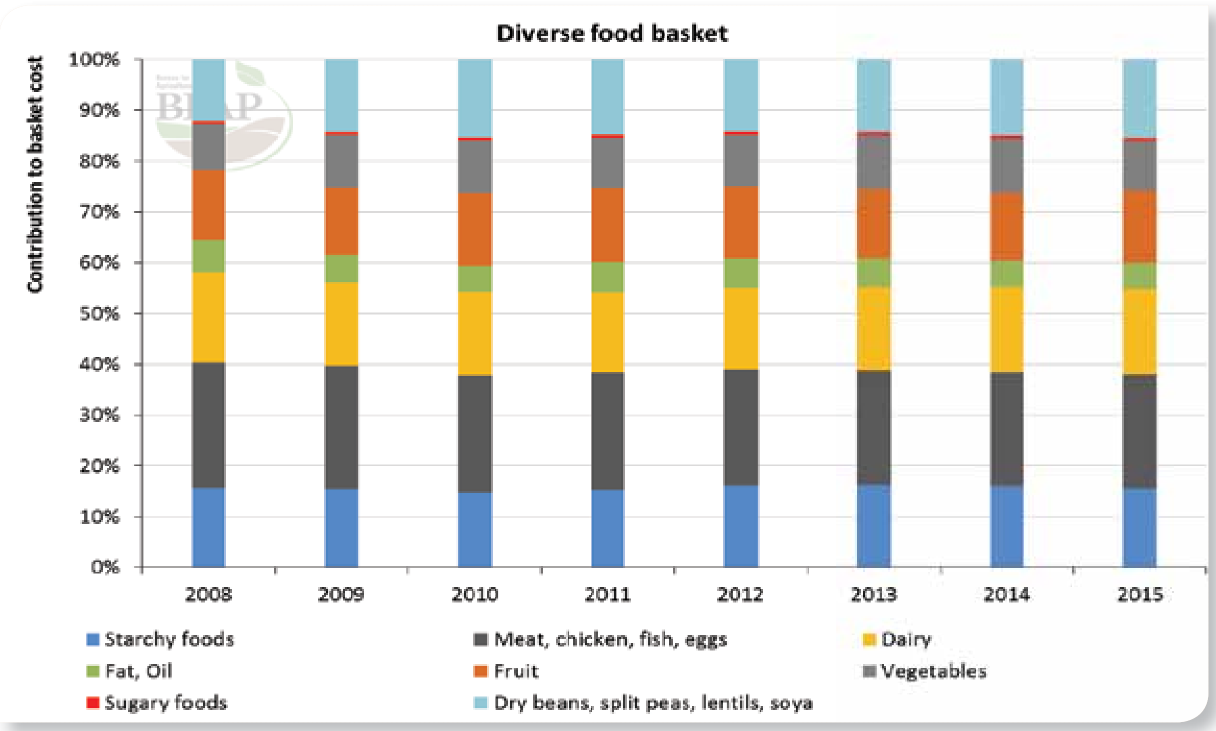


Figure 14.2: *The more diverse BFAP healthy food baskets for marginalised consumers – Average contribution of food groups to basket cost 2008 to 2015*

foods (around 14%), dairy (up to 13%) and vegetables (up to 11%). Within the more diverse monthly healthy eating plan, animal protein foods have the largest contribution (23% to 25%), followed by starchy foods (16%), dairy (17%), bean products (up to 15%), fruit (14%) and vegetables (10%).

Historical trends in the affordability of the BFAP healthy food baskets

Considering the period from January 2008 to April 2015, the BFAP healthy food baskets for marginalised consumers reflected the following upward trends:

- The more affordable monthly healthy eating plan increased by 63% to a level of R866 for an adult male or R3082 for a family of four (2 adults and 2 children).
- The more diverse monthly healthy eating plan increased by 54% to a level of R1072 for an adult male or R3732 for a family of four (2 adults and 2 children).

The specific food items within the BFAP healthy food baskets for marginalised consumers that made the largest contributions to the inflation recorded over the period January 2008 to April 2015 are presented in Figure 14.3.

Considering monthly household income levels in 2013 (SAARF AMPS 2013), Figure 14.4 indicates the inability of consumers in LSM 1, LSM 2, LSM 3 and possibly also LSM 4 to reach the more affordable healthy monthly eating plan. Consumers in LSM 5 and LSM 6 seem more able to afford such a healthy eating plan.

Comparing the BFAP healthy monthly food baskets for a four-member marginalised household to the CPI:

From January 2011 to April 2015, the more affordable monthly healthy eating plan for a family of four (2 adults and 2 children) increased by 36%, while the more diverse eating plan increased by a slightly lower 34%. For this time period the CPI headline index increased by a significantly lower 27%. These figures indicate that the cost of healthy eating has increased at a faster rate than general inflation in South Africa for the last few years (Figure 14.5).

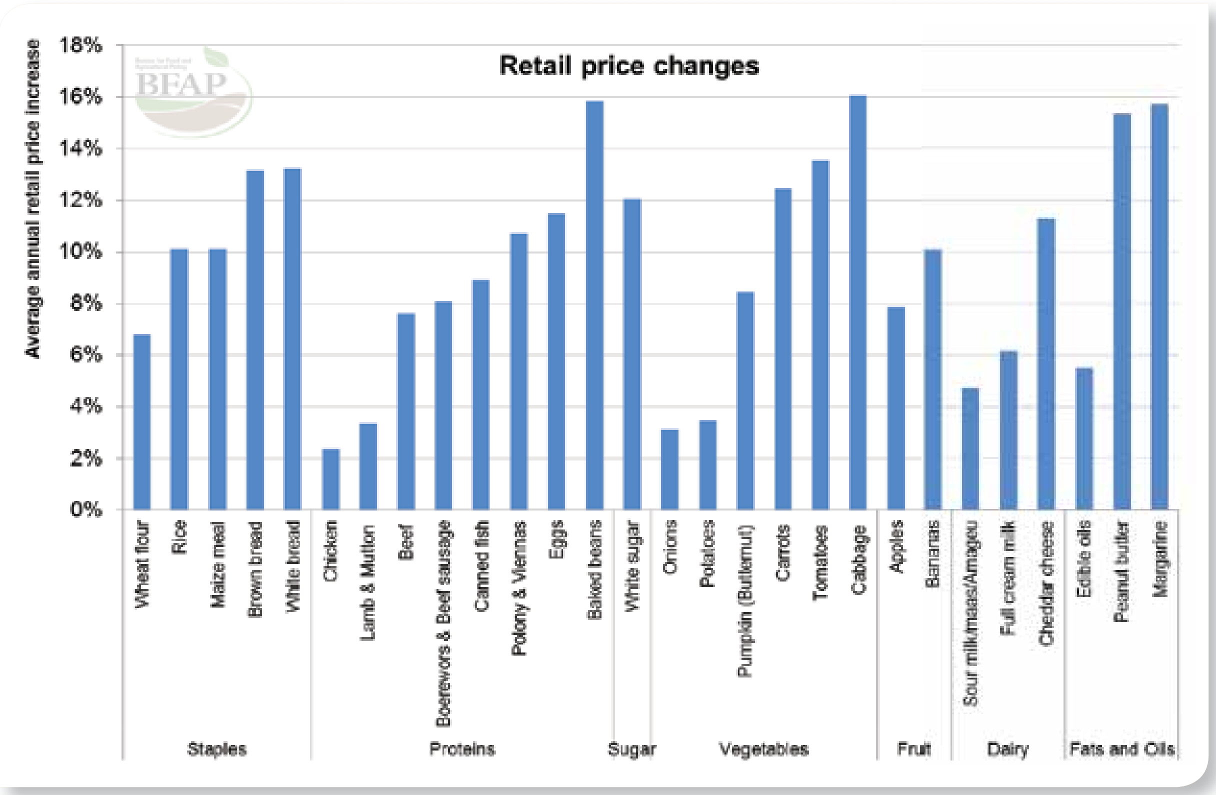


Figure 14.3: *Retail price changes within the BFAP healthy food baskets: January 2008 – April 2015*

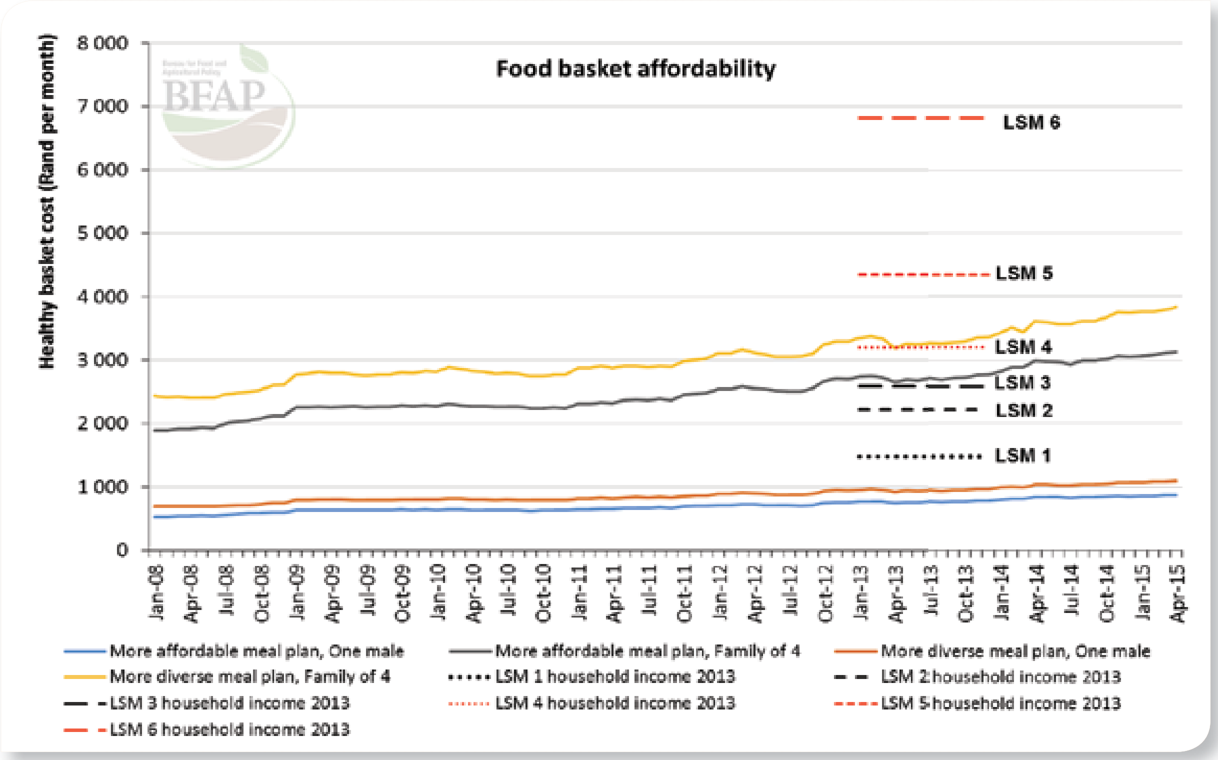


Figure 14.4: *The BFAP healthy food baskets for marginalised consumers - January 2008 to April 2015*

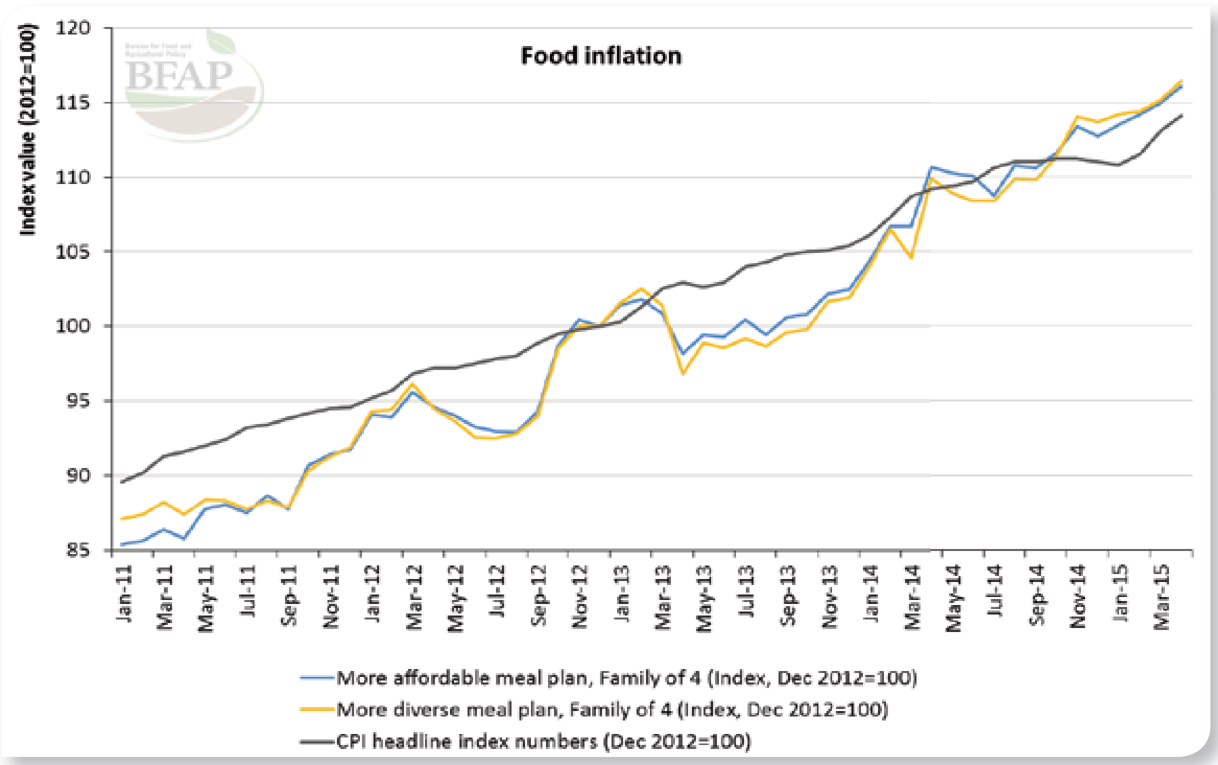


Figure 14.5: *Comparing the BFAP healthy food baskets for a four-member marginalised household to the CPI headline inflation index*

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