IMPACT OF POSSIBLE EUROPEAN UNION MARKET'S CLOSURE TO SOUTH AFRICAN CITRUS FRUIT

A report by BFAP

November 2013

The Bureau for Food and Agricultural Policy (BFAP)

The Bureau for Food and Agricultural Policy (BFAP) (www.bfap.co.za) is a network linking individuals with multi-disciplinary backgrounds to a coordinated research system that informs decision making within the Food System. The core analytical team consists of independent analysts and researchers who are affiliated with the Department of Agricultural Economics, Extension and Rural Development at the University of Pretoria, the Department of Agricultural Economics at the University of Stellenbosch, or the Directorate of Agricultural Economics at the Provincial Department of Agriculture, Western Cape. BFAP is the first of its kind in South Africa and has become a valuable resource to government, agribusiness and farmers by providing analyses of future policy and market scenarios and measuring their impact on farm and firm profitability. BFAP acknowledges and appreciates the tremendous insight of numerous industry specialists over the past decade.

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Executive Summary

The South African citrus industry covers 60 355 hectares and provides employment to over 100 000 people. The total wage bill of the citrus industry is estimated at R1.3 billion. Total production is estimated at 1.4 million tons of fruit, with the gross value of the industry estimated at about R8 billion. Exports account for about 70% of total production, but over 90% of the value of the industry. The European Union (EU) market is valued at almost R3 billion in 2012, with about 42% of South African citrus exports destined for this market. Considering the dependence of the SA market on the EU, closure of this market is expected to have significant impact on prices. These price effects will not be limited to the South African industry, but also have major implication for other citrus producers, specifically Southern Hemisphere suppliers.

Two alternative scenarios are analysed should the European Union close its market to South African citrus imports. Scenario 1 considers the case where the EU imposes a ban on all citrus fruit produced in South Africa, while Scenario 2 analyses the impact of an import ban only on fruit produced in regions where CBS is present. Under this scenario fruit produced in the Western and Northern Cape and the Free State are granted access to the EU. About 17% of area planted to citrus fruit is located in these regions. In both scenarios it is assumed that the import ban comes into effect in 2014 and the impact thereof is measured over a five year period. The direct impacts on the industry were estimated using a partial equilibrium model developed by BFAP. Out of this study, the main findings for the citrus industry can be summarised as follows:

i. The global citrus industry has increased from 2002 to 2012 both in value and to a lesser extent in volume terms. Though the share of the EU in global imports has declined over the past few years, it still accounts for 43% of world imports.
ii. South Africa is the biggest non-EU supplier of oranges, soft citrus and grapefruit imports into the EU.
iii. In the event of a complete import ban (Scenario 1), where the EU closes its market to all South African fruit, the projected decline on the average prices of citrus commodities in 2014 ranges between 35% for grapefruit and 54% for soft citrus. The impact on the average export price for oranges and lemons are both 36%. The initial price impact is the largest and as the industry gradually adjusts (fewer hectares under production and alternative markets) to the shock, the impact on prices declines over the five years analysed.
iv. The supply response of perennial crops is normally very low due to the large capital investment that initially is made and the lifespan of the orchards. In other words, when an industry is in distress, it takes a long period of time for investment to move completely out of the industry as it first has to go through a process of consolidation, finding alternative markets and a relative shift in productivity. This will be even more relevant for the South African citrus industry where the area under production has consistently increased over the past decade, implying a large share of new investments in the industry. The negative impact on the area under production due to declining profitability is increasing over time and will likely be larger beyond the outlook period covered in the project, namely 2014-2018.
v. A loss in hectares is associated with a loss in employment opportunities; hence, the increasing negative impact on area under production also means that the number of jobs lost in the industry will increase over time. Under Scenario 1 the estimated number of jobs lost in the citrus industry per season is projected to reach approximately 19 600 by 2018,

which amounts to 16% of the current total labour force in the industry. This implies that by 2018 19 600 workers per season will not earn a household income in the citrus industry. Beyond 2018 this impact is expected to be larger as more investment is shifted out of the citrus industry due to the adverse impact on net revenue.

vi. Under Scenario 1 the estimated loss is measured at R4.7 billion in the first year. That is 50% of the value of the industry will be lost. Over a five year period the cumulative loss will add to almost R26 billion.

vii. The impact on average export prices under Scenario 2 (where the EU closes its market only to fruit produced in CBS infected regions) ranges between 32% for grapefruit and 14% for lemons. The average price for soft citrus and orange exports is simulated at 29 and 25 per cent respectively. As with Scenario 1, the effect is declining over time, but remains significant over a five year time period.

viii. Similar to Scenario 1 the negative impact under Scenario 2 on the area under production and also on employment is increasing over time. Under Scenario 2 the estimated number of jobs lost in the citrus industry per season is projected to reach approximately 12 400 by 2018, equalling roughly 10% of the current total labour force. This implies that approximately 12 400 workers per season will not earn a household income in the citrus industry. Beyond 2018 this impact is expected to be larger as more investment is shifted out of the citrus industry due to the adverse impact on net revenue.

ix. Should the EU close its market only to fruit produced in CBS infected regions, the financial loss in 2014 is projected to reach R3.2 billion, equalling 34% of the value of the industry. Over a five year period the cumulative effect is estimated at R17.3 billion.

1. Introduction

The South African citrus industry covers 60 355 hectares, providing employment to roughly 84 500 on-farm jobs and almost 40 000 jobs up and down stream. Total production is estimated at 1.4 million tons of fruit, with the gross value of the industry estimated at about R8 billion. Exports account for about 70% of total production, but over 90% of the value of the industry. These facts highlight the importance of the citrus industry in providing employment in rural areas and its contribution to the economy and specifically earner of foreign currency. The citrus industry is also identified as one of the winning industries for its potential to create additional employment opportunities.

Now the South African industry is faced by the risk of the European market closing to our citrus fruit due to citrus black spot. Considering the importance of the European market to the South African industry, this move is expected to have major implications for the local industry. Moreover, considering the share of SA exports in world trade, closing the European market to South African imports is also likely to affect international trade and prices.

Though this citrus black spot issue dates back to 1992, it was only in 2012 that the European Union (EU) officially informed the South African Department of Agriculture, Forestry and Fisheries (DAFF) that they will move to market closure should they intercept 5 incidences of citrus black spot a year. DAFF and the European Plant Health Authority cannot come to an agreement due to different findings in their respective Pest Risk Assessments. As part of the process of fighting closure of the market the Citrus Growers Association (CGA) approached BFAP to conduct a study on the socio-economic impact should the EU ban citrus imports from South Africa.

Section 2 provides a brief explanation on citrus black spot and its presence in South Africa. It also shows the extent to which the South African industry is affected by CBS. This is followed in Section 3 by an overview of the global citrus fruit market and more specifically the European import market for citrus fruit. Section 4 provides an overview of the South African citrus export industry and highlights the importance of the European market to the South African industry. The impact of the possible import ban is discussed in Section 5, focussing on the direct loss should the EU market closes to SA citrus fruit, but also the wider implications for gross domestic product, household incomes and employment. Two alternative scenarios are analysed, the first being the outcome in event of a complete ban where all South African citrus is restricted from the EU. The second scenario analyses the effect should the EU impose a ban only on citrus produced in regions affected by CBS.

2. Citrus black spot

Citrus black spot (CBS) is a leaf-spotting and fruit-blemishing disease[1] among citrus fruits caused by a fungus named *Phyllosticta citricarpa* (Guignardia citricarpa Kiely), a sunken lesion (Agostini et al., 2006; EFSA, 2008). This lesion causes black margins and grey centres on the outer surface of the fruit which causes typical fruit blemishes which results in losses in both the yield and marketable quantities[2] (Kotze, 1981; Dewdney et al., 2012). Other symptoms include false melanose, cracked

[1] Point 6 of the Expert Panel summary: "CBS is primarily a cosmetic disease" (CBS Expert Panel, 2013).
[2] Point 8 of the Expert Panel summary: "CBS is only a serious disease under highly suitable climatic conditions in combination with the absence of general Good Agricultural Practices of commercial citrus production. It is

spot and early virulent spot and can affect the fruit, leaves and twigs of the trees. CBS is mostly[3] found in areas with warm, wet or humid climates with summer rainfall (Carstens et al., 2012).

According to Truter (2010) all commercial citrus cultivars are susceptible to CBS, but lemons are most susceptible. In other literature they also refer to Valencia, sweet oranges and tangerines/mandarin cultivars as being highly susceptible (Dewdney et al., 2012). There are three cultivars that are insensitive[4] to the pathogen, namely sour oranges and its hybrids, rough lemon and Tahiti acid lime (Carstens et al., 2012). According to Dewdney et al., (2011), the disease spreads through wind-borne spores, rain splash, or movement of infected plant material[5].

In South Africa, CBS was first reported in 1929 along the humid coastal regions of KwaZulu Natal and later spread to more inland regions (Kotze, 1981). Today the disease is known to occur in the citrus producing regions of KwaZulu Natal, Mpumulanga, Limpopo, North West and the Eastern Cape. However, the Western and Northern Cape Provinces and western Free State have been declared CBS free with no cases ever reported in these regions (Carstens et al., 2012; Truter 2010)[6]. Figure 1 below gives a graphic illustration of the spread of CBS in South Africa.

only under such conditions that the level of blemish and premature fruit drop may have an economic impact and be associated with yield reduction" (CBS Expert Panel, 2013).

[3] Point 2 of the Expert Panel summary: "CBS has a wide global distribution, but is only known to occur in summer rainfall citrus producing areas and nowhere in the world with a Mediterranean climate" (CBS Expert Panel, 2013).

[4] Point 9 of the Expert Panel summary: "CBS symptoms have never been reported (naturally or experimentally) on Tahiti lime" (CBS Expert Panel, 2013).

[5] Point 19 of the Expert Panel summary: "in conclusion, we are in agreement with earlier PRA's conducted by South Africa and the USA, in which it was concluded that fruit is not a realistic pathway for CBS to enter, establish, spread and have significant economic impact within the PRA area (EU). The focus should be on propagation material". See point 3 of the Expert Panel summary. (CBS Expert Panel, 2013)

[6] Point 4 of the Expert Panel summary: "Despite over 100 years of unregulated movement of citrus fruit and citrus plants and 84 years of unregulated movement of citrus fruit from CBS endemic areas to non-endemic areas in South Africa, CBS has not yet establish in any of these areas with a Mediterranean climate" (CBS Expert Panel, 2013).

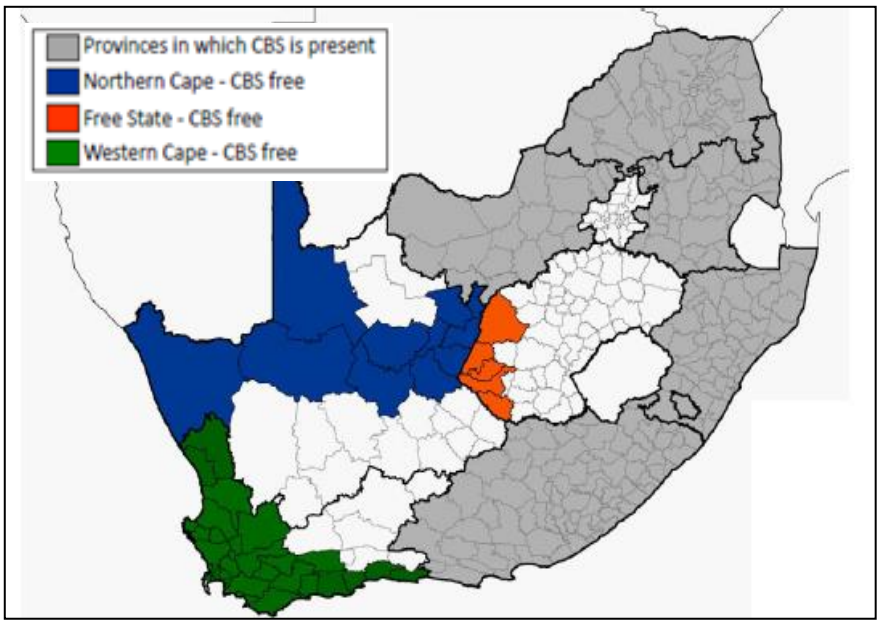

Figure 1: Spread of CBS in South Africa
Source: (Carstens et al., 2012)

There is much speculation on the approach that will be followed by the EU. Will the EU impose a country ban on South Africa, or will the CBS-free regions retain access? Will the EU ban all citrus commodities or will they be selective by banning only those commodities which hit 5 interceptions of CBS? In section 5 two different scenarios are analysed. The first assuming a total ban on South African citrus where citrus from all producing regions are blocked, irrespective whether the fruit is grown in CBS-free region. The second scenario assumes that the EU restricts only imports from CBS-infected regions. In that case fruit produced in the Western and Northern Cape and the Free State retains access to the European market. Currently, only South African citrus produced in CBS-free regions have access to the United States.

Table 1 shows that most of the citrus produced in South African originates from regions where CBS is present, with only 17% of citrus hectares planted in CBS free areas. Table 1 shows that 16% of the area planted to oranges, 44% of soft citrus, only 4% of grapefruit and 13% of lemons area is located in CBS free regions. These statistics already suggest that the impact is expected to be significant irrespective of the approach that will be followed by the EU should they impose an import ban.

Table 1: Share of area planted in CBS-free regions in 2012

	Total area	**Area in CBS-free regions**	
	Hectares	**Hectares**	**Percentage**
All citrus	**62 238**	**10 388**	**17%**
Oranges	40 884	6 643	16%
Soft citrus	5 863	2 605	44%
Grapefruit	9 403	346	4%
Lemons and Limes	5 514	723	13%
Other	574	0	0%

Source: CGA

3. An overview of the EU market for citrus fruit

This section will provide an overview of market trends and statistics for the citrus fruit market in terms of international trade. Firstly, an overview of the global citrus fruit market will be given by looking at changes over time in both value and volume of trade. This is followed by a study of the European Union (EU) as an importer of citrus fruit.

3.1. The global citrus fruit market

The past decade has seen a significant rise in the value of global citrus[7] imports. This is illustrated in Figure 1 which shows the annual value of citrus imports between 2002 and 2012, expressed in South African Rands and obtained from the International Trade Centre's (ITS) database (ITC, 2013). For analysis at the international level, this data source was considered to be the best suited in terms of country and product coverage.

Over the ten year period, the value of imports increased from R57.6 billion to R103.9 billion, an increase of over 80%, at an annual compound growth rate of 6% per annum. Oranges were the biggest import over this period with imports in 2012 reaching R39.8 billion. However, the share in the value of total citrus imports attributed to oranges fell from 42% in 2002 to 38% in 2012. The Rand value of imports of soft citrus more than doubled over the last decade reaching R37.2 billion in 2012 and increasing its share in total citrus imports from 30% in 2002 to 36% in 2012. Imports of lemons and limes in 2012 were R18.6 billion, representing 18% of total citrus imports. Grapefruit imports totalled R8.3 billion making up 8% of total citrus trade. These products appear to all have been drivers for the overall growth of the global citrus import market.

Changes in the value of imports can be reflective of changes in the volume of goods being imported. However other factors such as price changes and exchange rate fluctuations may also be playing a role. Figure 2 shows the annual quantity of citrus products imported. In 2012 the world imported 14.5 million tons of citrus fruits, made up of 6.3 million tons of oranges, 4.7 million tons of soft citrus, 2.4 million tons of lemons and limes and 1.1 million tons of grapefruits. In comparison to Figure 3 we observe a more modest increase between 2002 and 2012 with the nominal value of imports increasing by 43%, equating to increases of less than 4% per annum over the ten years. This demonstrates that though there has been a significant increase in the volume of citrus products traded, other factors, such as price and exchange rate changes, have also had a significant effect on the value of citrus imports when expressed in South African Rand.

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[7] For the purpose of this analysis, citrus fruits are made up of 4 groups listed below with their relevant 6-digit HS code:

- Oranges [080510: "Oranges, fresh or dried"]
- Soft Citrus [080520: "Mandarins(tang&sats)clementines&wilkgs &sim citrus hybrids,fresh/drid"]
- Lemons and Limes* [080550: "Fresh or dried lemons "Citrus limon, Citrus limonum" and limes "Citrus"]
- Grapefruit [080540: "Grapefruit, fresh or dried"]

The "Other Citrus" product group was ignored to avoid any confusion. This product group only makes up a very small share of global imports

* ITC use 2 codes for lemons and limes, the one used here (080550) is a new code which is only used from 2002 onwards. The 2nd lemon and limes category was 080530 ("Lemons and limes, fresh or dried") which stopped being used for most countries since 2002 but it continued to be used for certain countries. For this reason the grouping "Lemons and Limes" in this paper includes trade flows for 080530 added to 080550 (i.e. the sum of the two groups)

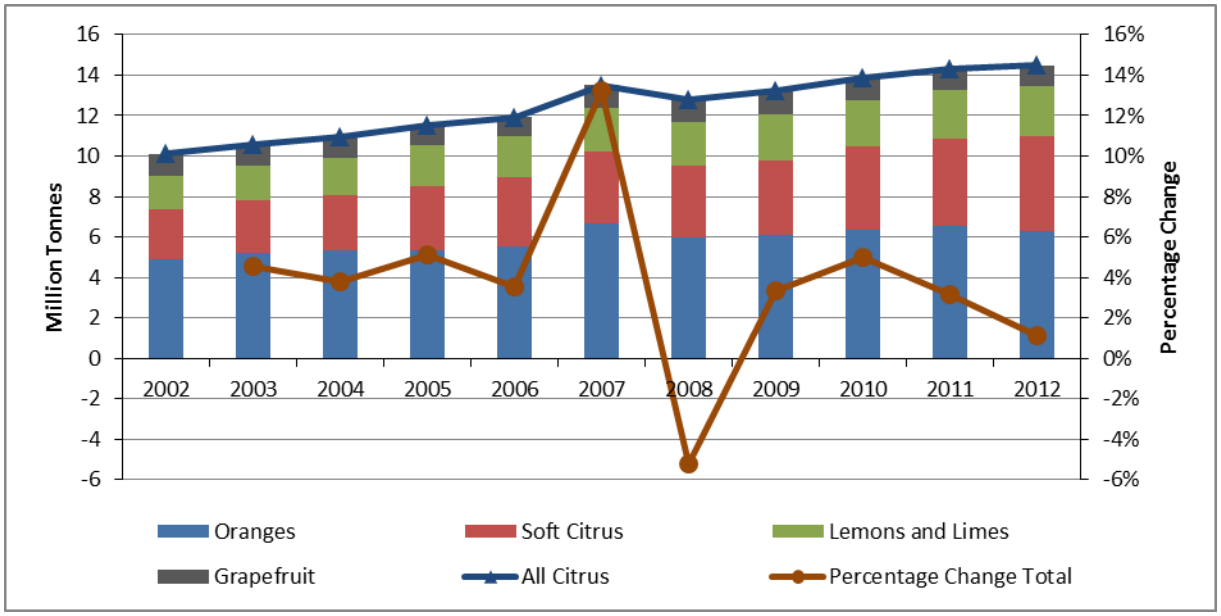

Figure 2: Quantity (tons) of global imports of citrus, 2002-2012
Source: ITC (2013)

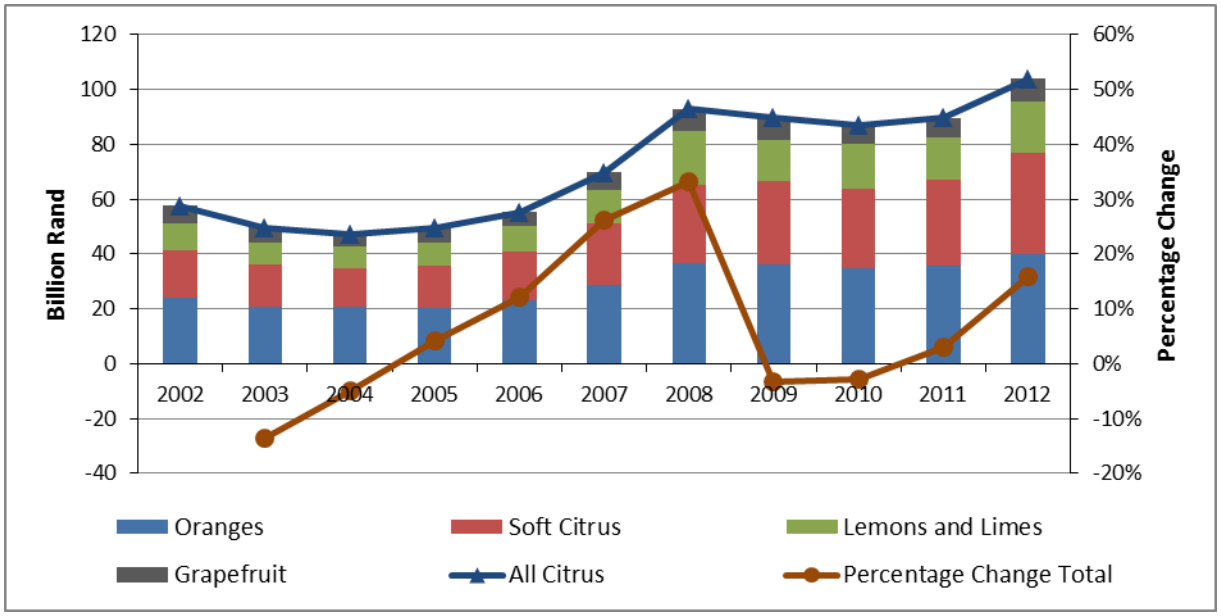

Figure 3: Value (Rand) of global imports of citrus, 2002 -2012
Source: (ITC, 2013)

When looking at the destinations for these products we see that there have been dynamic changes in the relative importance of markets. Although global citrus fruit imports have increased over the past decade, many countries have lost ground in terms of their relative share in global imports. Figure 4 indicates this effect by showing the market share in terms of citrus fruit imports for both 2002 and 2012. In each case the top 10 countries are displayed, with all the other countries lumped into a “Rest of the World” category.

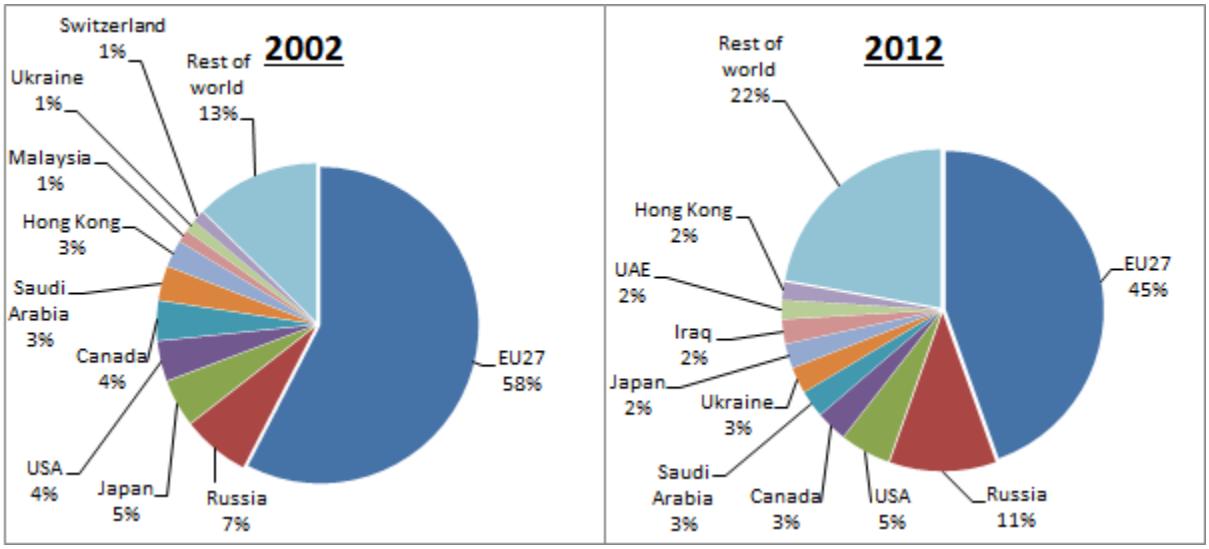

Figure 4: Countries importing citrus fruit, 2002 & 2012
Source: ITC (2013)

The main importer of citrus fruits is the EU (EU27[8]). In 2002 the EU imported 5.8 million tons of citrus fruits which equated to 58% of total global imports. These figures include intra-EU trade, i.e. trade occurring within the EU. The biggest importer outside of the EU was Russia which imported only 0.7 million tons (7% of world imports), followed by Japan which imported 0.5 million tons (5% of world imports).

In relative terms the EU lost ground over the ten years after 2002. The ground was made up by Russia, which saw its citrus imports increase to 1.6 million tons in 2012 (11% of world imports), an increase of approximately 125%, at a compound annual growth rate of over 8% per annum. There was also significant de-concentration of the countries importing citrus products with the share of citrus imports falling outside the top ten importers increasing from 13% in 2002 to 22% in 2012. However, the EU still remained dominant in the world citrus import market, importing 6.5 million tons in 2012, making up 45% of world imports.

When examining the import market of each fruit individually, some degree of consistency can be observed. Figure 5 shows the global import destinations for the four citrus product groupings. The increasing prominence of Russia is evident across all groupings. In 2002 Russia's highest share was 8% for oranges as well as for lemons and limes, by 2012 Russia's lowest market share was 8% for the same two groups whilst the country's imports for soft citrus and grapefruit had increased from 7% and 3% to 16% and 11% respectively. The EU lost out on their share in imports in all cases except grapefruit but still maintained their dominance, in 2012 accounting for more than 40% of imports of all product groupings. In all cases we observe the increase in the share of the rest of the world, again highlighting that the global citrus import market has become less concentrated.

[8] For the purpose of this paper, the European Union is made up of the countries of the EU27, which are all members of the European Union as at the end of 2012. Despite the fact that twelve of the EU27 members were not members in 2002, the EU27 is used for all time periods to ensure consistency. The full list of EU27 member countries is:
Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, United Kingdom (UK), Austria, Finland, Sweden, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia, Bulgaria and Romania.

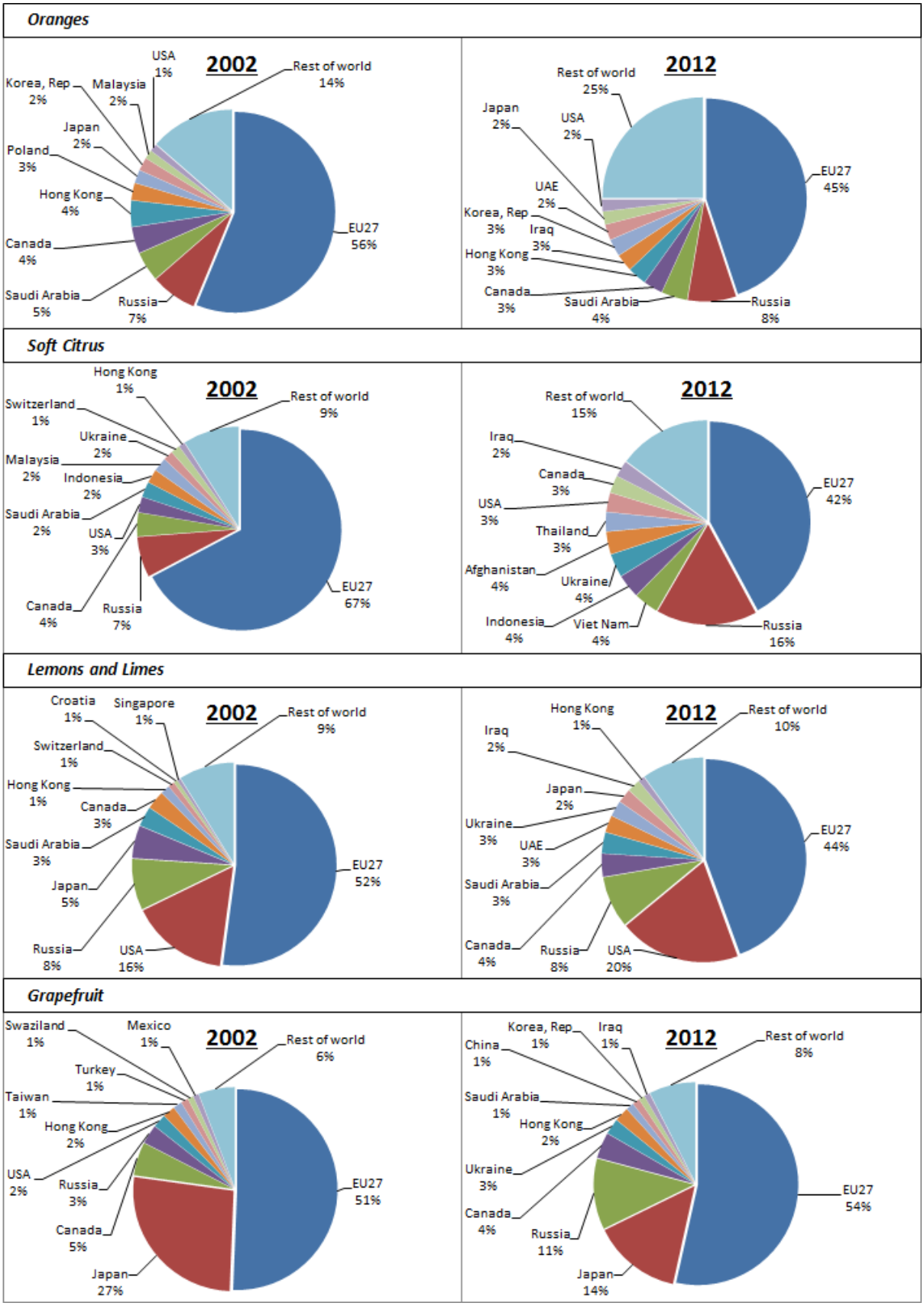

Figure 5: Countries importing specific citrus fruit, 2002 & 2012
Source: ITC (2013)

3.2. The EU import market for citrus fruit

The EU is the most important importer of citrus fruit in the world, with almost half of total imports going into these markets in 2012 (ITC, 2013). Figure 6 shows the aggregate annual value of citrus imports by EU-member countries between 2002 and 2012 (including intra-EU trade). The trend in EU citrus imports is very similar to that of global imports, showing the importance of the EU in the global market. However the drop in imports after 2008 is more severe for the EU than for the world as a whole. Although there has been a significant recovery in 2012, the value of imports in 2012 remains below the 2008 level. Despite this, between 2002 and 2012 overall imports increased from R34.3 billion to R49.6 billion, an increase of 44%. Annually this works out to an increase of 4% per annum over the ten years.

Orange imports for 2012 reached R17.9 billion, making oranges the biggest contributor to the value of total citrus imports into the EU countries with a share of 36%. This is, however, down from 2002 where oranges made up 40% of the value of total citrus imports. Soft citrus was very close behind at R17.3 billion (35%). Lemons and limes had a 2012 value of R9.9 billion (20%). Finally, the value of grapefruit imports totalled R4.5 billion (9%).

In terms of the volume of citrus imports by EU member countries, displayed in Figure 7, we see very little change in imports over the 10 year period. In total citrus imports increased from 5.9 million tons in 2002 to 6.5 million in 2012, an increase of 10% or increasing at 1% per annum over ten years.

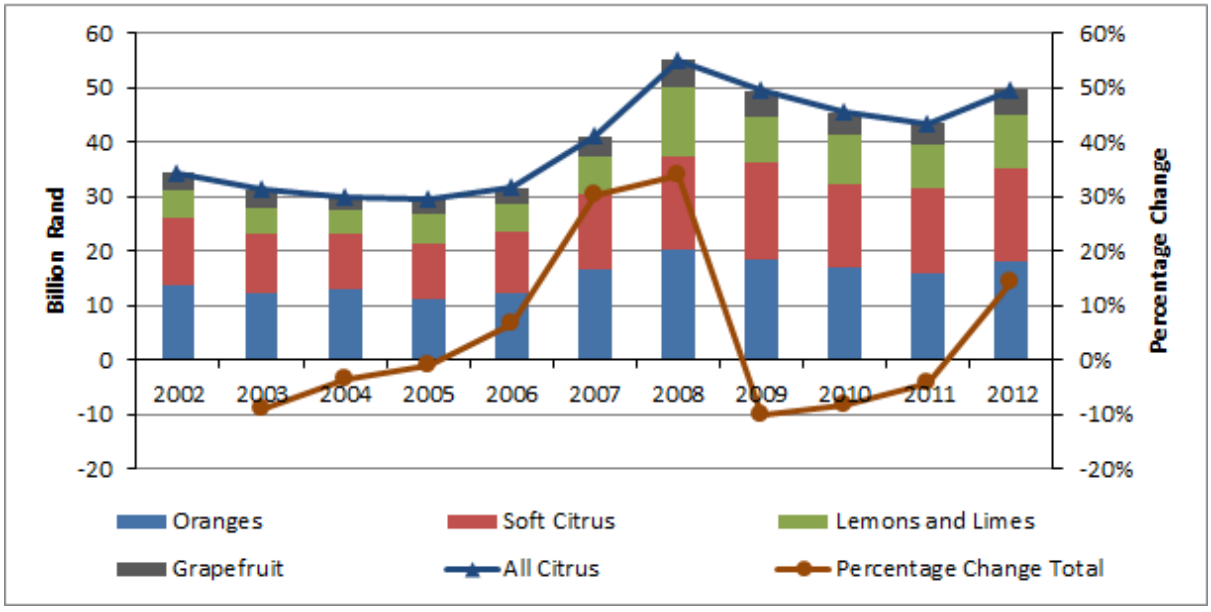

Figure 6: Value (Rands) of total citrus fruit imports by EU member countries (incl. intra-EU trade), 2002-2012
Source: ITC (2013)

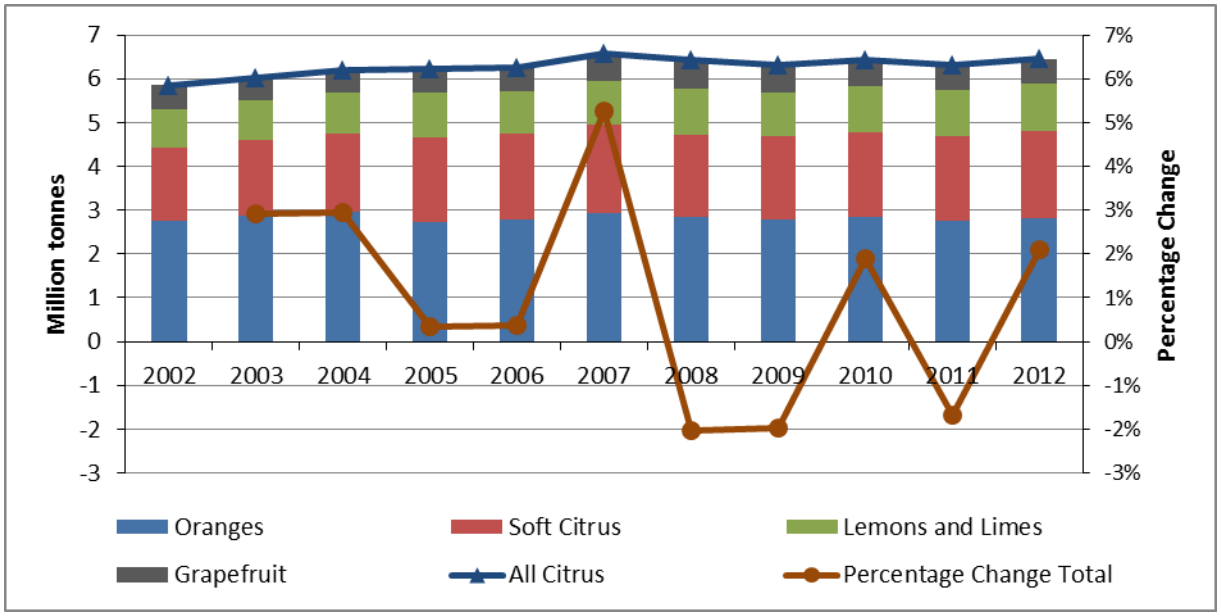

Figure 7: Quantity (tons) of total citrus fruit imports by EU member countries (incl. intra-EU trade), 2002-2012
Source: ITC (2013)

The biggest importers of citrus products within the EU have been Germany, France, the United Kingdom (UK) and the Netherlands. Together these four countries imported 3.8 million tons of citrus products in 2012 making up 58% of total citrus imports by EU member countries. The breakdown of import destinations for the individual EU countries in terms of their global citrus imports is shown in Figure 8 for both 2002 and 2012.

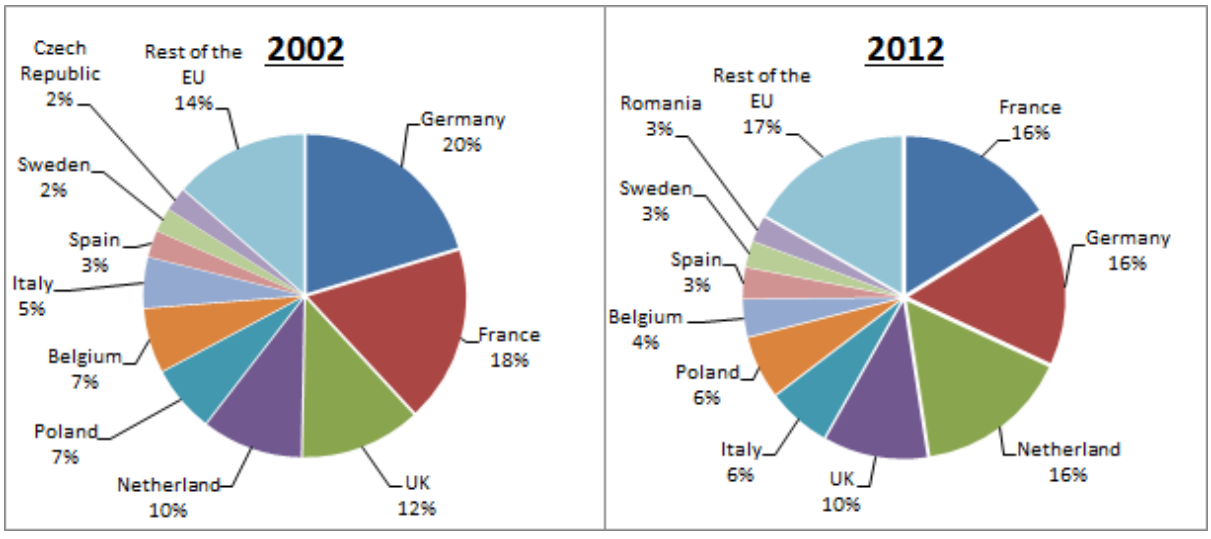

Figure 8: EU member countries importing citrus fruit, 2002 & 2012
Source: ITC (2013)

As at 2012, intra-EU trade accounts for almost 67% of citrus imports into the EU. In other words almost 67% of citrus imports into EU countries are sourced from other countries within the EU. However, there are still more than two million tons of citrus fruits which are sourced from outside of the EU. The share of fruits sourced internally varies between the different fruits, with the proportion

of oranges, soft citrus, grapefruit and lemons and limes sitting at approximately 68%, 83%, 24% and 57% respectively (ITC, 2013).

Figure 9 shows the breakdown of the suppliers for citrus into the EU markets from outside of the EU (i.e. extra-EU trade). South Africa is by far the most important supplier of citrus products into the EU, supplying approximately a third of imports. This share has significantly increased from 2002 when it was a quarter. In both 2002 and 2012 the next three biggest suppliers into the EU, in order, are Argentina, Turkey and then Morocco. All three of these countries have seen a decline in the importance of their citrus imports into the EU over this period.

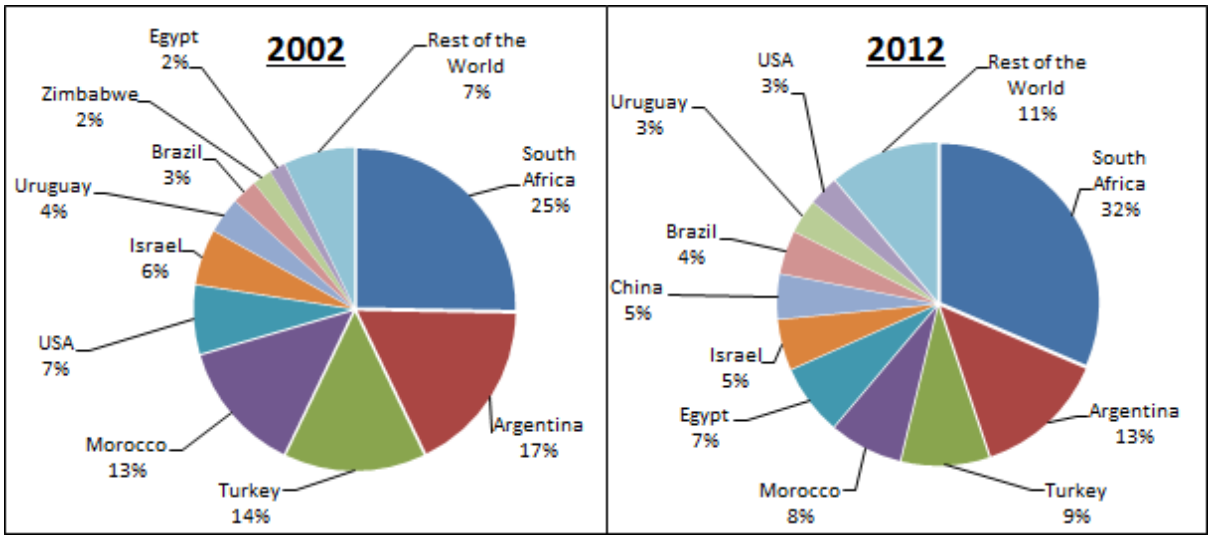

Figure 9: Countries supplying the EU with citrus fruit (incl. extra-EU trade only), 2002 & 2012
Source: ITC (2013)

If we break down Figure 9 into the different product groups, displayed in Figure 10, we see significant variation. However, in 2012 South Africa was the biggest supplier for three of the four product groups, the exception being lemons and limes where it still supplies a significant 11% of imports into the EU.

This reflects an increase since 2002 for all products in terms of South Africa's share in the supply of EU citrus imports. In 2002 South Africa was only the top supplier of oranges, supplying 39% of orange imports into the EU. By 2012 this share had risen to the extent that South Africa supplied half of all orange imports into the EU. In 2002 South Africa was the third main importer of soft citrus into the EU, making up 14% of imports, and the second main importer of grapefruit, making up 21% of imports. By 2012 South Africa was the top supplier for both products (together with Morocco and China for soft citrus and grapefruit respectively), increasing its share to 21% and 23% respectively. Argentina is the main supplier of lemons and limes, although the country's share in total imports into the EU fell between 2002 and 2012 from 62% to 43%. Over this period South Africa's relative position in terms of imports of lemons and limes into the EU fell from third to fourth but the country's share in total imports rose from 9% to 11%.

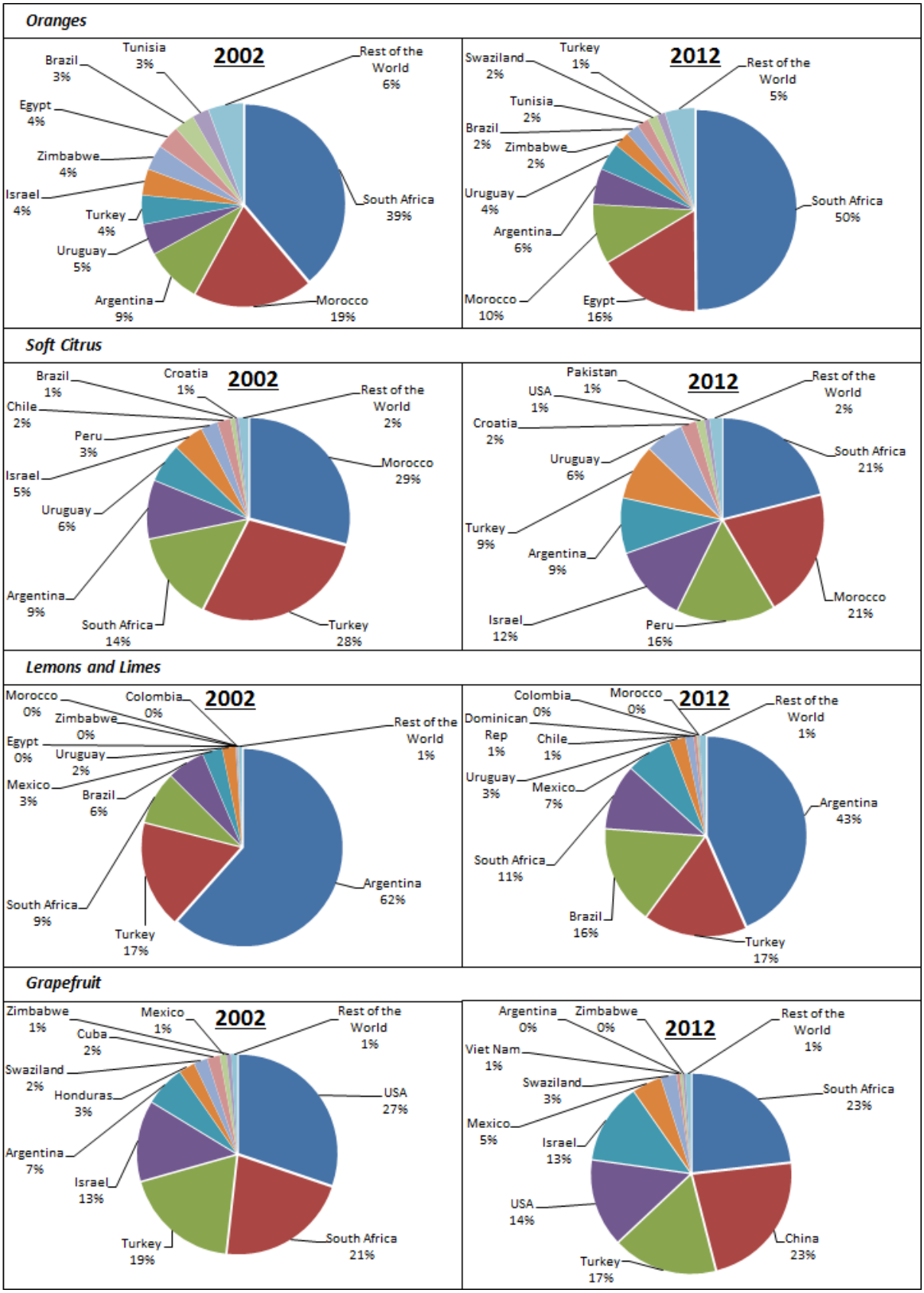

Figure 10: Countries supplying EU with specific citrus fruit (incl. extra-EU trade only), 2002 & 2012
Source: ITC (2013)

4. An overview of SA citrus export industry

South Africa is one of the world's major exporters of citrus fruits. Table 2 shows some summary statistics for the volume of citrus exports from South African citrus exports and the country's position on the global playing field. In terms of volume and market share, in 2012 South Africa was the second largest exporter of citrus products, making up approximately 14% of world citrus exports. In terms of the global rankings for specific products, South Africa is ranked second for the export of oranges, sixth for soft citrus, second for grapefruit and fifth for lemons and limes.

Table 2: South African citrus exports summary

	HS6 Code	Exports 2012 (Tons)	Share in World Exports	World Ranking	Compound Annual Growth Rate 2002-2012
Oranges	080510	1 097 299	17.13%	2	5.21%
Soft Citrus	080520	122 058	2.57%	6	5.77%
Grapefruit	080540	178 255	17.33%	2	0.73%
Lemons and Limes	080550	165 828	6.35%	5	8.14%
Total Citrus		1 563 440	14.03%	2	4.87%

Source: ITC (2013)

The strong performance of South African citrus exports is proven over the past decade where the compound annual growth in exports was approximately 5% per annum. Figure 11 shows the annual value of South African exports of citrus products from 2002 to 2012. Over this period the value of exports has grown by more than 240% from R2.2 billion in 2002 to R7.4 billion in 2012. Oranges were the biggest export making up approximately 65% of citrus exports from South Africa.

Data supplied by South Africa's Perishable Products Export Control Board (PPECB) give detailed accounts of export flows of citrus products out of South Africa (PPECB, 2013). Using this data we can get a very accurate account of the quantities of citrus fruits leaving South Africa each year and the destination of these exports. Figure 12 shows the annual quantities of citrus fruits exported out of South Africa between 2002 and 2012. Over this period the amount of goods exported increased from 928 000 tons to 1 385 000 tons, an increase of 49% at an annual compound growth rate of 3%. In 2012 South Africa exported approximately 4 774 000 tons of oranges, 922 000 tons of soft citrus, 899 000 tons of lemons and limes and 766 000 tons of grapefruit.

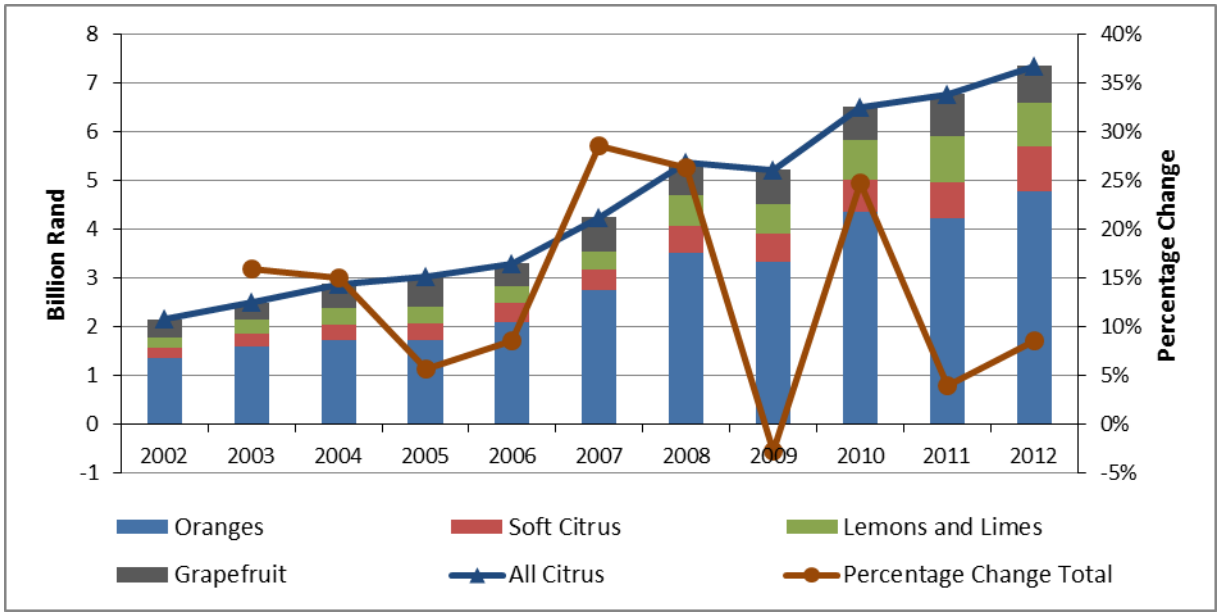

Figure 11: Value (Rands) of citrus fruit exported by South Africa, 2002-2012
Source: ITC (2013)

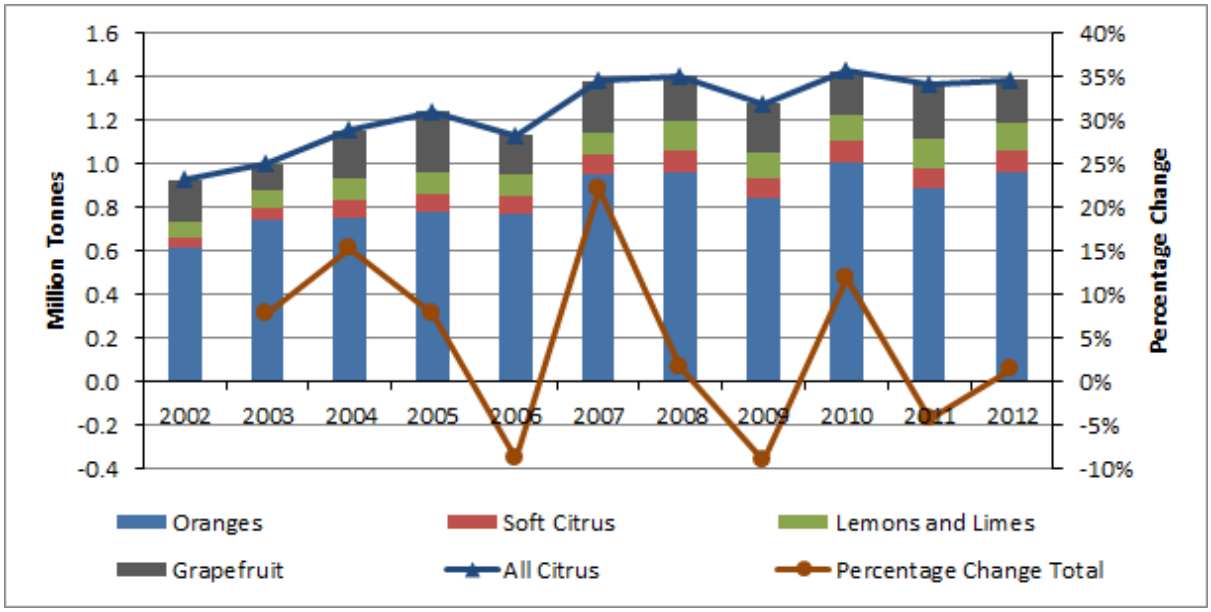

Figure 12: Quantity (tons) of citrus fruit exported by South Africa, 2002-2012
Source: PPECB (2013)

Figure 13 shows the breakdown of the destinations of South African citrus exports for 2002 and 2012 according to the PPECB data. Over this period we see a degree of diversification in terms of South Africa's export destinations. The share of exports going to countries outside of the top 10 destinations rose from 3% to 11% over the ten year period. We also see that the largest destination, the EU, lost out on market share, falling from 54% to 42%. Despite this drop in share the EU remained the key destination for South Africa's citrus exports with South Africa exporting approximately 600 000 tons of citrus products to the EU in 2012.

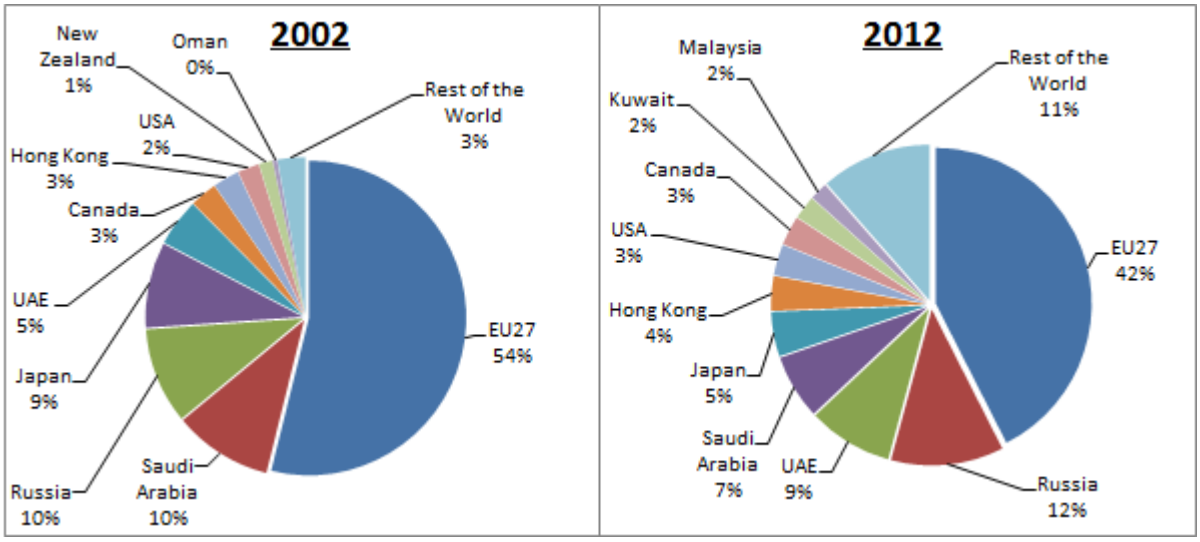

Figure 13: Destinations for South African exports of citrus fruit, 2002 & 2012
Source: PPECB (2013)

Looking at each of the product groupings we see that the EU was the biggest destination for all citrus products' exports, but with varying degrees of importance (See Figure 14). Russia was in the top three destinations for all citrus products groups for 2012. The United Arab Emirates (UAE) is also a very important market for the exports of lemons and limes, with South Africa exporting approximately 29 000 tons (21% of total exports) to the UAE in 2012. The UAE featured in the top 10 across all products and in all cases improved its relative share since 2002. In 2012 Japan accounted for almost a third of all grapefruit exports, however this is down from the share in 2002 when Japan and the EU together accounted for 91% of South African grapefruit exports.

Once again we see the general diversification of citrus exports from South Africa, with the proportion of exports going to countries outside of the top 10 increasing for all products and the proportion going to the main exporting destination, the EU, declining.

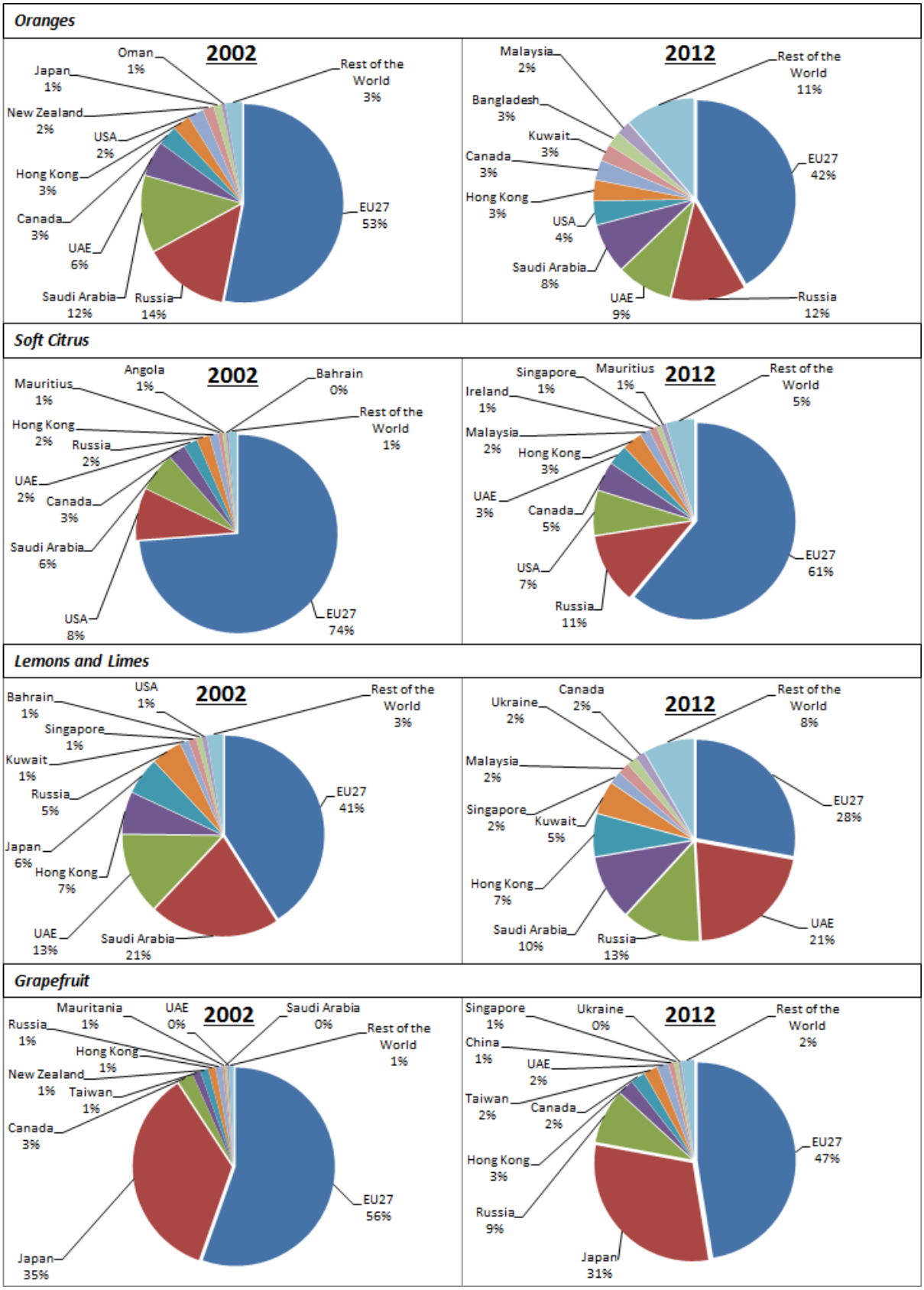

Figure 14: Destinations for South African exports of specific citrus fruit, 2002 & 2012
Source: PPECB (2013)

Despite the decline in importance, the EU remains the main destination for all citrus products. Citrus exports from South Africa to the EU have also grown significantly in absolute terms since 2002. Figure 15 shows the annual value of South African citrus exports to the EU between 2002 and 2012. In Rand terms the exports have increased from R1 billion in 2002 to R2.9 billion in 2012, an increase of 192%, this equates to an annual compound growth rate of over 11% per annum.

In terms of actual quantities exported, we see a much more modest picture. Figure 16 shows the tons of citrus products exported to the EU between 2002 and 2012. Exports in 2012 were only 19% higher than in 2002, meaning an annual growth rate of less than 2% per annum. There was a sharp drop following the global financial crisis in 2008 and corresponding recession in Europe. Over the years following 2008, exports have remained a long way off their 2008 level when South Africa exported approximately 734 000 tons of citrus products to the EU.

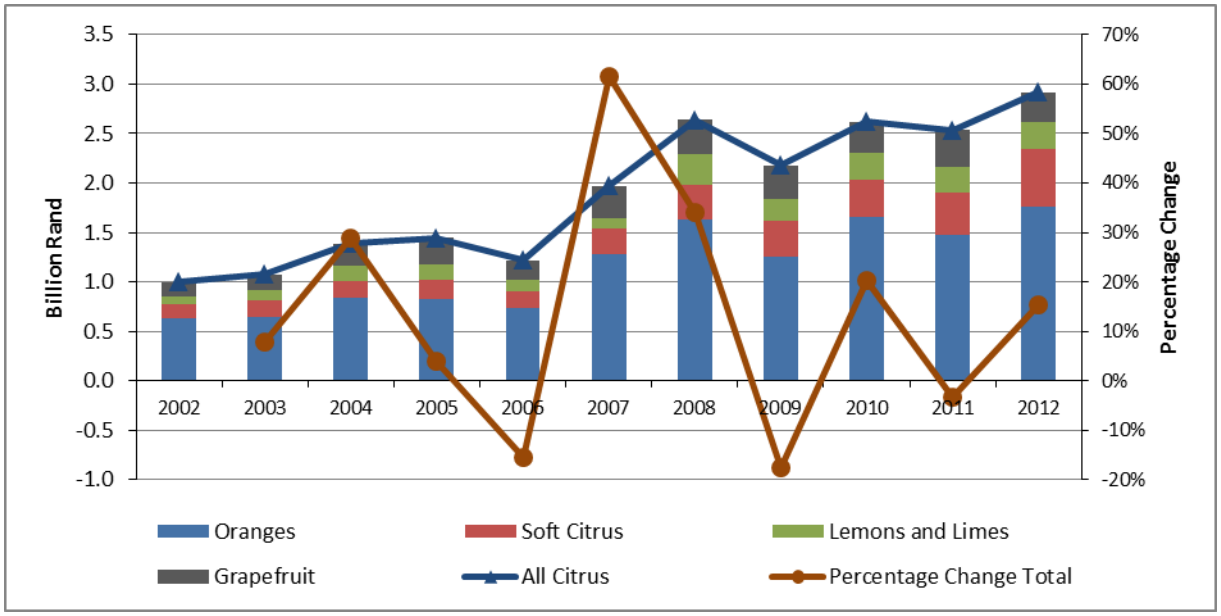

Figure 15: Value (Rands) of South Africa citrus exports to the EU, 2002-2012
Source: ITC (2013)

Export quantities of lemons and limes to the EU in 2012 were actually around 16% lower than in 2002, averaging out to a 2% decline per year over 10 years. For oranges, soft citrus and grapefruit, exports increased at annual compound rates of 2%, 5% and 3% per annum respectively. Oranges made up the bulk of exports with South Africa exporting approximately 403 000 tons to the EU in 2012. Grapefruit, soft citrus and lemons and limes were significantly less at approximately 92 000 tons, 62 000 tons and 38 000 tons respectively.

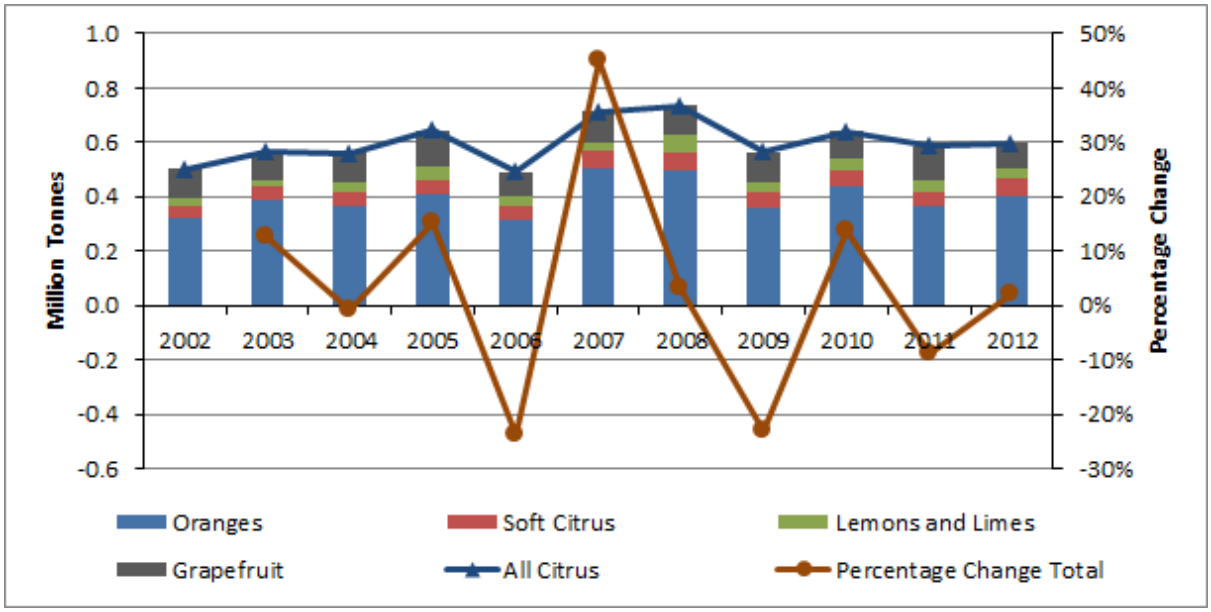

Figure 16: Quantity (tons) of South African citrus exports to the EU, 2002-2012
Source: PPECB (2013)

Notwithstanding the stabilising in the volume of citrus trade with the EU in recent years, we saw significant growth in the value of this trade between 2002 and 2012, and the region remains the most important destination for South African citrus exports. Table 3 shows the proportion of total citrus exports going to the EU as shown in Figures 13 and 14. In 2002 the EU was the destination for 54% of South Africa's citrus exports, signifying the reliance of South African exporters on EU markets. Whilst it is true that this importance declined over the 10 years leading up to 2012, the EU was still the destination for 42% of South Africa's citrus exports and in particular was the destination of 61% of soft citrus exports.

Table 3: Reliance on EU market for SA citrus exports

	% of exports destined for the EU	
	2002	**2012**
Oranges	53%	42%
Soft Citrus	74%	61%
Grapefruit	56%	47%
Lemons and Limes	41%	28%
All Citrus	**54%**	**42%**

Source: PPECB (2013)

Within the EU, the main destination is the Netherlands which serves as port of entry to many EU and some non-EU countries. This is illustrated in Figure 17 which shows the breakdown of member country destinations for South African citrus exports to the EU. In 2012, South Africa exported approximately 304 000 tons of citrus products to the Netherlands; this was 52% of all exports to the EU, a significant increase in the share from 2002 which was 37%. The UK is another very significant market for South African citrus exports, exceeded by only the Netherlands in both 2002 and 2012. However, unlike the growing export market of the Netherlands, citrus exports to the UK declined between 2002 and 2012, in both absolute terms and in terms of relative share. Statistics do not capture the final destination of fruit entering Europe. The increase in Netherlands' share and the

accompanying decline in the UK's share might point towards increased diversification of fruit destined for other EU countries, but also reflects an increase of fruit exports to eastern European countries not part of the EU.

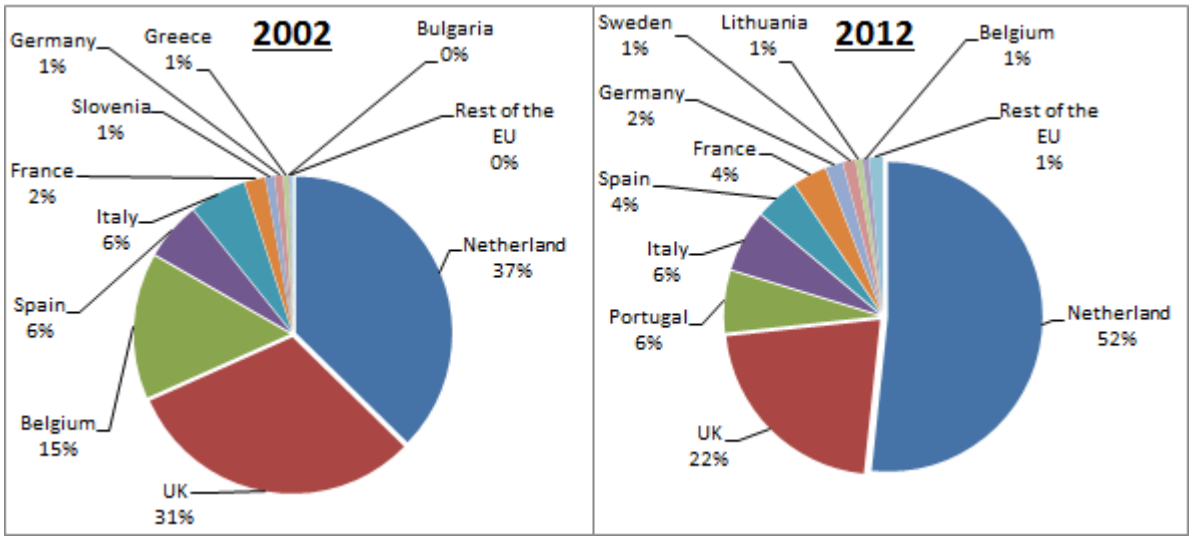

Figure 17: EU destinations for South African citrus exports, 2002 & 2012
Source: PPECB (2013)

Not only is the EU absorbing the bulk of South African export volumes, but returns in the EU market also compares favourably to that of competing markets. Figure 18 shows that for all citrus commodities returns in the EU market falls somewhere in the middle of the range of prices obtained in the different regions of the world. The pricing information presented in Figure 18 were sourced from various citrus exporters and measured at delivered in port (DIP) level.

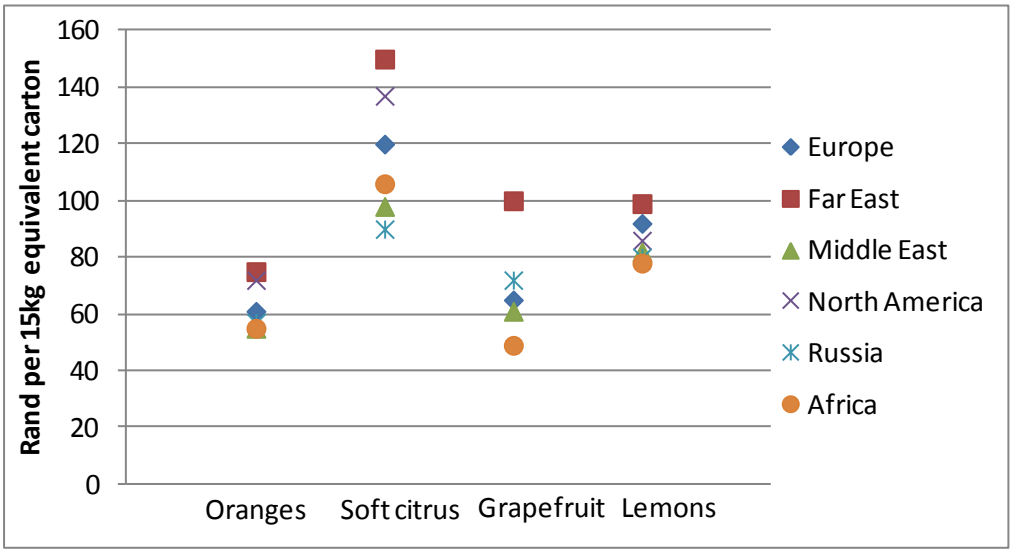

Figure 18: Average prices in different marketing regions for specific citrus fruit, 2012 (Rand per 15 kg equivalent carton)
Source: Various exporters

In 2012 prices for oranges averaged between R55 and R75 per R15kg equivalent carton, with returns in the EU around R61 per carton. Soft citrus obtained the highest returns, with average prices ranging from R90 to R150 per carton. The average price in the EU was around R120 per carton. Prices received for grapefruit varied between R49 and R100 per carton, with returns in EU market at R65 per carton. Finally prices for lemons ranged between R80 and R99 per carton, with the EU prices at the upper end of the range at R92 per carton. From the graph it is evident that for 2012 citrus sold in the Far East tends to earn premium prices compared to other regions in the world, while prices in Africa tends to be at the lower end of the range.

It is important to take note that these prices only provide an indication of relative returns and there is much variation among the data supplied by the exporters. Also, these prices are only reflective of the 2012 season and will vary over years due to changes in market conditions and fluctuations in the exchange rate. The depreciation in the exchange rate during 2013 and the projected continuation of the depreciation of the currency in years to come will exert upward pressure on prices and therefore the value of the industry.

It is interesting to observe that in general South Africa has been able to take advantage of a less concentrated global import market for citrus products and diversify its citrus export markets over the past decade. This allows the economy to become less dependent on its main trading partners and in particular the EU. However, it is also clear that the EU still provides the market for the bulk of South Africa's citrus exports, making continued trade essential for the development of South Africa's citrus industry. With the current threat of the closure of the EU markets due to CBS, it is important to gain an understanding of what this may mean for the economy. An impact analysis of the potential market closure is carried out in Section 5.

5. Quantifying the impact should the EU market close

Considering the reliance of the South African citrus fruit industry on the EU market, as highlighted in the previous section, an import ban will cause a structural shift in the South African citrus industry. Currently South Africa exports about 40 million 15kg equivalent cartons to the EU. Transferring the entire volume to non-EU markets implies increasing supply to those markets by more than 75%. Exporters agree that non-EU markets are unable to absorb all the excess supply. Redirecting 40 million cartons to other markets will have a detrimental impact on prices, sending returns crashing below break-even levels. Supplying fruit at below break-even levels not only result in huge financial losses, but also puts South Africa at risk of being accused of dumping fruit in non-EU markets. As a consequence potential safeguard measures might be brought against South African exports.

One of the main challenges is to determine the scope for increasing supply in the various markets. This raises a number of questions. What are the saturation levels in those markets and how sensitive is the price to increasing supply? What will be the reaction of competing suppliers? How do South African production costs compare to that of competing suppliers and at what price levels do their producers break-even? Over the medium to longer term, what innovative measures will producers take to reduce production cost? What will be the value of the Rand over the next few years? The list of questions is endless. Some answers can be quantified or modelled, but over many answers one only speculates.

Another key uncertainty is how industry role players, specifically growers and exporters, will respond to the market closure. There are probably two extreme scenarios of what might happen in the event of a ban of citrus fruit exports to the EU. On the one hand, exporters might aim to move as much fruit as possible to alternative markets, having detrimental impact on prices. Flooding alternative markets will send prices crashing to levels far below break-even point resulting in great losses. Crashing markets are likely to impact not only on the current season, but also to send signals that will affect price negotiations and trading for seasons to come.

The second approach will require great coordination and discipline from the industry, including growers and exporters. With this approach, it is agreed to protect alternative non-EU markets by managing supply in order to preserve certain price levels. This approach will entail determining the maximum amount of fruit, given certain specifications demanded by consumers (e.g. count (size) and colour), allocated to various markets. This should be done of course within the rules of the Competition Law. The rationale behind this approach is to preserve and grow markets over time and to save face internationally in the midst of the disaster. Given the small size of the local fresh market, the bulk of this fruit will end up with processors. Considering that the price of fruit delivered for processing is roughly one tenth of the price of fruit exported, the financial loss of this approach is also expected to be significant.

The actual response of the industry is most likely to lie somewhere between the two extreme cases mentioned above. In reality knowledge is incomplete or imperfect and information is lagging. In most instances prices will probably drop below break-even levels, especially in the period immediately following the ban.

Irrespective of the approach followed by the South African citrus industry, prices in non-EU markets are expected to decline significantly sending ripple effects throughout the international market. South African exports of oranges and grapefruit to the EU accounts for about 7 and 10 per cent of world trade respectively (see Table 4). Though the share of South African trade with the EU in soft citrus is much lower at about 2%, the impact is still expected to be significant considering South Africa being the leading Southern Hemisphere exporter of soft citrus (sharing this position with Argentina) and over 60% of SA soft citrus exports are destined for the EU. Consumer prices in the EU will most probably skyrocket as other suppliers are unlikely to make up the volume lost from South Africa, especially considering that CBS is present in the majority of Southern Hemisphere supplying countries. On the other hand, the lower returns in the alternative markets will also have major price implications for competing suppliers, especially considered that South African fruit is often perceived superior to that of our competitors.

Table 4: SA exports to EU as share of world trade

	2010	**2011**	**2012**
Oranges	7%	6%	7%
Soft Citrus	2%	1%	2%
Grapefruit	8%	10%	N/a
Lemons and Limes	2%	2%	2%

Source: BFAP calculations using ITC and PPECB data

The next session provides a brief overview of the different markets. First the potential of other regional markets are discussed shortly, followed by an overview of consumer preferences in section

5.2. There after (section 5.3) the BFAP partial equilibrium model developed for the citrus industry was applied to quantify the likely loss should the EU market closes for South African citrus fruit. Two different scenarios are analysed in terms of the extent of the ban imposed by the EU. Finally, the results from a general equilibrium model are reported in section 5.4 to indicate the wider implications for the South African economy in terms of lost employment opportunities, household income and gross domestic product (GDP).

5.1. Potential of alternative markets

- **Russia**

Not only did Russia increased its share in world imports during the previous decade (as pointed out in Section 3), but expansion into Russia most probably poses the largest opportunity for South African citrus fruit should the EU close its borders. The Russian population is estimated at over 140 million people and the economy is projected to expand by more than 3.5% per annum over the next five years (IMF, 2013). South Africa's main competitors in Russia include Argentina in lemons, Egypt in oranges, Argentina in soft citrus and Turkey and Israel in grapefruit. The industry is of the opinion that there is room to increase supply of oranges and lemons to Russia, but not grapefruit and soft citrus. The Russian market is not very price sensitive, but considering that returns in the Russian market is already at relative low levels there is not much room for prices to drop before it breaks through the break-even point.

- **Middle East**

There is opportunity to increase supply into markets in the Middle East. South Africa is the main supplier to this region, with some competition from Australia, Egypt, the United States of America (USA) and Argentina in lemons. The key markets within the Middle East include Saudi Arabia, United Arab Emirates and more recently Kuwait. The Iranian market also holds potential. During 2009 South Africa exported almost 1.6 million 15kg equivalent cartons to Iran, but following the imposed import tariff of around 40% and sanctions, volumes exported to this market is negligible. The economic outlook for this region is positive with IMF projections for GDP growth above 3% per annum for our main trading partners in the region (IMF, 2013). However, political unrest might hinder expansion into other Middle Eastern markets. There is scope to increase supply of oranges, soft citrus and lemons, but generally speaking consumers prefer smaller fruit compared to consumers in the EU. This will be discussed in more detail in the next section.

- **Far East and Asia**

South Africa's main destinations within the Far East and Asia include Bangladesh, China, Japan, Malaysia and Singapore. These markets have great potential considering the size of its populations and also the prospects for economic growth. The IMF projects economic growth rates in excess of 5% for the region (IMF, 2013). However, despite the market potential, expansion into the Far East progresses slowly. In the absence of well-known global retailers exporters are left doing business with smaller importing agents. Building trustworthy relationships takes time. Other challenges faced in these markets include language barriers, availability of so-called credit lines to enable payment and logistical and infrastructural challenges. Access to ports, conditions of roads and the availability of cold chain infrastructure is to mention but a few of these challenges. South Africa's main

competing suppliers include Australia in oranges and soft citrus, the USA in grapefruit and Argentina in lemons.

Though the Chinese market is enormous in terms of for example population and projected income growth, the consumers are very specific in their requirements of fruit. Returns are relatively high, but consumers demand fruit of superior quality. Any quality issues result in claims often eroding any profits. Moreover, not all citrus varieties, especially lemon varieties, can handle the cold sterilisation required by China's trade protocol.

There is a demand for oranges, especially late Valencia's, and soft citrus in India, but the 30% plus import tariff erodes the profitability of the market.

- **North America**

Returns in the Canadian market are very sensitive to changes in supply, leaving little if any room for further growth. This perception is supported by the PPECB figures showing stable exports to Canada over the past few years. Citrus exports to the United States are limited to regions free of citrus black spot, which is to the Western Cape, Northern Cape and western Free State. Only about 17% of South African citrus is produced in these regions. An interesting development as that, in the technical debate on citrus black spot between South Africa and the EU, the USA supports the South African pest risk assessment in that CBS cannot be transferred via fruit. Considering this finding it is likely that South Africa will approach the USA to re-negotiate access to its market.

- **Africa**

In terms of economic spending power Africa holds huge potential. The total population of Sub-Saharan Africa is estimated at over 910 million people in 2012. Moreover, an estimated 37% of the population resides in urban areas and the urban population is increasing rapidly (World Bank, 2013). The average rate of economic growth for the region is projected above 5.5% per annum over the next five years (IMF, 2013). Though South African exports of other fruit kinds into Africa has increased rapidly over the past few years (especially apples), exports of citrus fruit remain low. Currently only 1% of all South African citrus are exported to Africa. South Africa accounts for less than 3% of citrus trade within the African continent, with the main competition coming from other African countries including Algeria, Sudan, Angola, Mauritius, Libya, Zambia, and Kenya (ITC, 2013). Many of these countries are not major producers of citrus fruit, but the fruit probably originates from neighbouring countries like Egypt. Notwithstanding, the point is that South African citrus fruit are competing with citrus fruit grown elsewhere in Africa.

5.2. Consumer preferences

This section is not meant to provide a detailed analysis of consumer trends or preferences with regards to citrus consumption. It serves the point of illustrating the importance of the EU market and the uniqueness of each market in terms of demand for fruit. Recognising the differences in consumer preferences assist in understanding the current mix of citrus grown in South Africa, existing trading patterns and the barriers in changing trading patterns.

- **Oranges**

South Africa is exporting about 64 million cartons of oranges, of which 26 million is destined for the EU. The 26 million cartons exported to EU can be divided into roughly 12 million cartons of Navels and 14 million cartons of Valencia's.

Navel oranges destined for the EU are large fruit, generally not in demand in other regions of the world as consumers prefer smaller fruit. Hence, the alternative markets for these Navels are very much limited. There is a demand in Russia, but the majority of Navels produced in South Africa are early varieties competing with produce from Egypt. The Egyptian fruit enters the market at lower prices and though the quality of Egyptian fruit is perceived inferior compared to the South African product, quality of Egyptian fruit is improving. This competition from Egypt results in low margins in Russia limiting the scope for expansion in the Russian market. There is a small market for larger Navels in China, but the Chinese are very specific demanding high quality fruit with a specific shade of orange. Also, not all Navel varieties can handle the cold sterilisation required by the China trade protocol. Consumers in the Middle East demand smaller fruit size, so there is not much scope for increasing supply. In general, African consumers prefer sweeter fruit hence South African Navels with its relatively high acid levels do not compete well with alternative oranges.

There exists a greater demand for Valencia's. Alternative markets for these oranges include Russia as Valencia's do not compete directly with Egyptian oranges; demand in Eastern European countries like Ukraine is increasing; there is scope increasing exports of smaller sized Valencia's to the Middle East; volumes exported to Bangladesh is also increasing; and finally, there is a marketing window before the Chinese moon festival of shifting volumes of high quality fruit to China. Africa also holds potential for increasing Valencia exports as Valencia's have sweeter taste and handle rough road travelling better compared to Navels.

- **Soft Citrus**

Soft citrus is the most competitive market with South Africa and Argentina exporting about 100 000 to 110 000 tons each and volume from Peru increasing. Of the 7.6 m cartons exported by South Africa, about 4.8 million is destined for the EU. Though a large share of exports are destined for Europe, the industry is confident that much of the fruit will find homes in other markets like China, Middle East, Africa and India. Some exporters are of the opinion that there is room to increase supply into Russia, particularly Clementine's, but this view is not shared by all. There is demand to increase soft citrus supply to China, though there is some uncertainty on how certain varieties will handle the required cold sterilisation treatment. Fortunately, soft citrus is trading at prices well-above break-even point so there is room for prices to fall before incurring major losses. The biggest challenge with soft citrus is probably the variety Satsuma. These fruit are demanded particularly by the UK, with only a small share sold in the Middle East. About 20% of SA soft citrus area is planted to Satsuma varieties.

- **Grapefruit**

The increase in demand for grapefruit has slowed since 2005, with world production actually declining the past three years. South Africa exports about 14.5 million cartons of which 6.8 million is destined for Europe. The market for Grapefruit is very concentrated with the EU, Japan and Russia

accounting for over 90% of total exports. The Russian market is fairly saturated leaving few opportunities of increasing exports to alternative markets. There is also little scope to increase supply to Japan. Another downfall of grapefruit is the inelasticity of demand: even though prices may fall, it is unlikely that consumers will buy more fruit.

- **Lemons**

South Africa exports about 9 million cartons of lemons of which 2.6 million are exported to the EU. Argentina is the largest Southern Hemisphere exporter of lemons in the world, but also with a strong processing sector. Recently, relative high inflation and the strength of the Peso discouraged fresh exports, resulting in relatively empty markets during the Southern Hemisphere production season. Some exporters are of opinion that the Russian market can absorb an additional 1 million cartons before prices will drop to below break-even point (assuming an exchange rate of R10/USD). There is limited room to increase supply to the Middle East and Far East as these markets demand smaller fruit. On the positive side, lemons exports obtain prices well above break-even point so there is room for prices to drop. The downfall with lemons, as with grapefruit, is the demand is relatively price inelastic, especially in more developed countries. The drivers in demand for lemons are developing countries like Russia and other eastern European countries. In Africa there is also a market for fresh lemons, but is currently limited to retailers and the catering business.

5.3. The direct economic impact of the possible import ban

The previous sections underline the importance of the European market to the South African citrus industry as well as the risk involved for other supplying countries in the fact that trading between SA and the EU accounts for a relatively large share of international trade in citrus fruit. Sections 5.1 and 5.2 discussed the opportunities but also the limitations of increasing exports to alternative markets. The purpose of this section is to determine the economic impact should the EU market closes to South African citrus fruit. Models developed by the Bureau for Food and Agricultural Policy (BFAP) are used to determine the economic impact of the pending market closure.

The BFAP model is a dynamic recursive partial equilibrium model. The components of demand and supply are identified and equilibrium is established ensuring demand equals supply. The technique used is similar to that of the Food and Agricultural Policy Research Institute (FAPRI) at the University of Missouri, Columbia, in the United States of America. BFAP also collaborates with the Food and Agricultural Organisation (FAO) of the United Nations. The BFAP models proved to be useful in combining it with scenario planning and answering “what if” questions. The model projects future prices and volumes under a particular set of assumptions. These assumptions cover a whole range of variables including, macro-economic information (exchange rates, inflation, economic growth, etc.), population growth, energy prices, weather patterns and trade agreements to mention but a few. However, considering that markets are extremely volatile and characterised by high levels of uncertainty it is by no means possible to forecast the future. Recognising this fact BFAP specialises in scenario analysis in which different future outcomes are considered and analysed in order to obtain a balanced view of how the future might unfold.

In order to analyse the impact of the possible EU market closure to SA citrus fruit, first a so–called Baseline scenario is simulated. The Baseline takes the latest trends, policies and market information

into consideration and in this instance also assumes current trade agreements will prevail. To quantify the impact of the ban two alternative scenarios are analysed. First, the outcome in the event of a complete ban, where no citrus is exported to the EU, is analysed (Scenario 1: Complete import ban). A second approach is considered where citrus fruit produced in CBS-free areas retain access to the EU (Scenario 2: Exports limited to CBS-free regions). In both instances, the outcome of the scenario is measured against the Baseline scenario to determine the loss of the import ban. It is assumed the import ban comes into effect for the 2014 season and the impact thereof is measured over the next five years.

Before turning to the results, one first needs to consider the assumptions on the value of the Rand. The exchange rate is one of the key drivers in any export industry. Though the value of the citrus exports is considerable, any changes therein are not sufficient to have a significant impact on the value of the Rand. For this reason the Rand is treated as an exogenous variable and the projections for the Rand remains the same for the Baseline and the two scenarios analysed.

The average value of the Rand is assumed at R9.50 against the US dollar and R12.50 against the Euro for 2013 (see Table 5). The Rand is projected to strengthen somewhat in 2014, before following a gradually depreciating path over the next four years. A stronger currency will result in a worse outcome presented below, whereas a weaker currency will alleviate the impact of the EU market closure.

Table 5: Assumptions on value of the Rand

	2013	**2014**	**2015**	**1016**	**2017**	**2018**
R/USD	9.50	9.44	9.78	10.12	10.44	10.81
R/Euro	12.50	12.41	13.29	13.84	14.28	14.79

Source: BFAP

In order to fully comprehend the implications of the threatening market closure, some understanding of the structure of the South African citrus industry is required. The industry has developed with the focus of exporting fresh fruit. On average 68% of total production is exported fresh, while about 25% of production is delivered for processing. The local market for fresh citrus fruit is small and accounts for only 7% of production. Though these shares vary for the different citrus commodities, the same principles count: i.e. production is aimed for the export market, the fresh local market is small and the processing industry serves the purpose of removing any surplus fruit and/or fruit of inferior quality. It is only the grapefruit industry in which the processing market plays a significant role, accounting for 40% of the volume of production.

Considering returns in the different marketing channels, the highest returns are obtained in the export market across all citrus commodities and the lowest returns in the processing industry. Over the past five years, orange prices in the local fresh market equals 43% of the average return in the export market. The corresponding figures for soft citrus and grapefruit are 64% and 58% respectively. Lemons is the only commodity for which local prices are comparable to export prices as local returns equate to about 91% of export returns over the past five years. This ratio has however shifted more in favour of the export market in the past three years. Prices for fresh fruit in the local market are determined by demand and supply. Considering that citrus fruit trades mostly below break-even levels locally, there is not much room to increase supply in the local fresh market, with lemons potentially being the only exception to this statement. Having said that, it should be noted

that the local market remains very small in terms of volume and the increase in the local market will not be nearly sufficient to off-set the decline in exports.

The price of processed fruit is again much lower compared to that in the fresh local market. The price received for oranges delivered for processing equals a mere 11% of the return in the export market. The corresponding figures for soft citrus, grapefruit and lemons are 5, 8, and 17 per cent respectively. That is fruit delivered for processing is valued at between one tenth and one fifth of fruit delivered for fresh exports. The price for processing fruit is a derivative of international prices for fruit juice concentrate.

5.3.1. Scenario 1: Complete import ban

Table 6 shows that about 43 million cartons are projected to be exported to the EU under the Baseline scenario. In Scenario 1 where citrus exports to the EU is assumed to be banned completely, about 14 million of the 43 million cartons are projected to be delivered to non-EU export markets and 800 000 cartons to the local fresh market. This translates into an increase of 8% in local volumes. About 1.2 million cartons of the projected volume destined for Europe under the Baseline scenario will not be produced in the first place as it is unlikely new orchards are to be established should the import ban be imposed. This leaves 27.3 million cartons or 410 000 tons of citrus fruit for the processing industry.

Currently SA processes about 500 000 tons of citrus fruit. Processors might have capacity for an additional 150 000 tons, but as it takes 12 to 18 months to build new processing plants, about 260 000 tons of fruit will have no destination or be wasted. The impact of additional volume on processing prices are expected to be relatively small (less than 10%) as South Africa is a price taker in international market for fruit juice concentrate and local prices for processed fruit are derived from international prices.

Over the longer term it is unlikely that the industry will spend great amounts on additional processing plants as returns for processing do not justify cost of production. In some countries citrus fruit are grown exclusively for the processing industry (e.g. oranges in Brazil), but that involves different production practices at much lower costs compared to that of managing an orchard for fresh exports. It is impossible to apply both these production systems successfully on one farm or even in the same region. In other words, you cannot apply the higher production cost system to one orchard for fresh fruit exports and manage the next orchard for processing. The reasons being that different plant protection programmes are followed and area wide pest control management is required. The local industry will be faced by some difficult strategic decisions should the EU close its market to South African citrus.

Table 6: Scenario 1 – Distribution of exports meant for the EU market (million 15kg equivalent cartons)

	Baseline: projected 2014 exports to EU	Scenario 1: Change in 2014 exports*			
		Increase in exports to non-EU markets	Increase in fresh local volumes	Cartons not produced	Processing/ Other
All citrus	**42.9**	**13.5**	**0.8**	**1.2**	**27.3**
Oranges	29.0	8.8	0.6	0.7	18.9
Soft Citrus	5.1	2.6	0.1	0.2	2.2
Grapefruit	5.7	0.7	0.0	0.3	4.8
Lemons	3.1	1.5	0.0	0.1	1.4

Source: BFAP

*Numbers may not add up due to rounding

Break-even prices at export level are considered between R55 and R65 per 15kg equivalent carton, with soft citrus at the higher end of these margins. These estimates serve only as a general guideline as these price levels depend on various factors including farm size, diversity of farming activities, age of orchards, composition of varieties, distance to port, etc. Table 7 shows that under the Baseline scenario prices are well above the break-even levels, but in event of the EU market closing, prices are projected to drop to below break-even prices in the first year. The average export price for 2014 is projected to decline by between 35 and 54 per cent, with the smallest effect on the average price for grapefruit and the largest impact on that of soft citrus.

These price impacts are simulated using a price equilibrator for South African fruit where demand equals supply for South African exports. Though the response of other Southern Hemisphere suppliers are critical in determining supply and price levels, no specific assumptions are made on the allocation and distribution of citrus fruit of other suppliers. As a result these price changes could be either an under- or overestimation of the true impact. However it is believed that supply from South Africa into a market will continue until the average price will drop to around break-even levels. So in actual fact, the increase in volume exported to non-EU markets quoted in Table 6 could be either an under- or overestimation of the true outcome. If the EU closes its market to other suppliers infected with CBS, the volume exported to non-EU markets will be overstated (due to increased supply from competing countries) and consequently the loss to the industry will be underestimated (see Table 9), On the other hand, if supply from other suppliers is shifted away from non-EU markets to the EU-market, higher volumes of South African fruit can be supplied to non-EU markets; hence the volume of fruit to non-EU markets is underestimated and the loss to the industry overestimated.

Table 7: Scenario 1 – Impact on average export prices for 2014 (Rand per 15kg equivalent carton)

	Baseline	Scenario 1	% change
Oranges	R77	R49	-36%
Soft Citrus	R123	R56	-54%
Grapefruit	R77	R50	-35%
Lemons	R81	R52	-36%

Source: BFAP

Prices are projected to recover to some extent over time. Taking inflation into consideration prices are projected to increase up to break-even level roughly, with the exception of lemons. Lemons is the only commodity that is projected to show positive returns already by 2016. Table 8 shows that the average price for oranges increases from R49 per 15kg equivalent carton in 2014 to R64 per carton in 2018, soft citrus price from R56 to R88 per carton, grapefruit from R50 to R64 per carton and lemons from R52 to R84 per carton. These prices are however still significantly lower compared to the Baseline situation with access to the EU.

The driving forces behind the increases in prices are demand factors including increasing buying power as population increases and economic growth boost spending power, the development of existing and new markets, but also a minor decline in South African supply. In the first year major losses are suffered as returns crash to below break-even prices; consequently supply adjusts in order for prices to recover to at least break-even level.

Table 8: Scenario 1 – Impact on average export prices, 2014 to 2018

	Scenario price (Rand per 15kg equivalent carton)					**% decline from Baseline price**				
	2014	**2015**	**2016**	**2017**	**2018**	**2014**	**2015**	**2016**	**2017**	**2018**
Oranges	R49	R52	R56	R60	R64	-36%	-35%	-33%	-32%	-31%
Soft Citrus	R56	R70	R75	R81	R88	-54%	-47%	-46%	-44%	-43%
Grapefruit	R50	R53	R56	R60	R64	-35%	-35%	-35%	-34%	-32%
Lemons	R52	R63	R69	R75	R84	-36%	-25%	-21%	-18%	-14%

Source: BFAP

The loss to the industry is summarised in Table 9. The gross value of the industry is estimated at R9.4 billion in 2014. Taking the ripple effects on the local market, the processing industry and the wasted fruit into consideration, the loss to the industry in the first year of the ban is estimated at over R4.7 billion. That is an estimated 50% of the value of industry will be wiped out. Over the next five years the loss increases in absolute nominal terms to about R5.6 billion, but its share of the value of the industry declines to 45%. The total loss over the five years add up to almost R26 billion.

Table 9: Scenario 1 – Loss of EU market closure to SA citrus industry (Rand billion)

	2014	**2015**	**2016**	**2017**	**2018**
Total citrus industry					
Baseline Value of industry	9.366	10.094	10.781	11.491	12.310
Loss of import ban	4.722	4.947	5.122	5.336	5.574
Loss as % of value of industry	50%	49%	48%	46%	45%
Orange industry					
Baseline: Value of industry	6.087	6.567	7.019	7.479	7.999
Loss of import ban (Rand)	2.998	3.217	3.338	3.501	3.677
Loss of import ban (%)	49%	49%	48%	47%	46%
Soft citrus industry					
Baseline: Value of industry	1.099	1.192	1.275	1.359	1.455
Loss of import ban (Rand)	0.703	0.721	0.764	0.800	0.844
Loss of import ban (%)	64%	61%	60%	59%	58%
Grapefruit industry					
Baseline: Value of industry	1.060	1.132	1.189	1.245	1.306
Loss of import ban (Rand)	0.579	0.624	0.648	0.673	0.699
Loss of import ban (%)	55%	55%	55%	54%	54%

Lemon industry					
Baseline: Value of industry	1.121	1.203	1.298	1.408	1.550
Loss of import ban (Rand)	0.442	0.385	0.371	0.362	0.353
Loss of import ban (%)	39%	32%	29%	26%	23%

Source: BFAP

The orange industry is projected to bear the largest share of the R4.7 billion with R3 billion loss in oranges, followed by the soft citrus industry (R703 million), grapefruit industry (R579 million) and lastly the lemon industry (R442 million). However, the soft citrus industry will suffer the highest loss in that this industry is projected to lose about 64% of the value of the industry. This is followed by the grapefruit industry (55%), the orange industry (49%) and lemon industry (39%).

For Scenario 1 and 2, the net loss in total revenue is initially induced by the decline in market prices. However, over the long run, the partial equilibrium model simulates a decline in total production of citrus as hectares are lost due to the negative impact on profit margins.

The supply response of perennial crops is normally very low due to the initial large capital investment and the lifespan of the orchards. In other words, when an industry is in distress, it takes a long period of time for investment to move completely out of the industry as it first has to go through a process of consolidation, alternative markets and a relative shift in productivity. This will be even more relevant for the South African citrus industry where the area under production has consistently been increasing over the past decade, implying a large share of new investments in the industry. The initial impact on area planted to citrus fruit is relatively small, but the impact is increasing over time. Under scenario 1, the model projects that by 2018 7% of the area under production of citrus will be lost. The impact on the area under production will likely be larger beyond 2018. The BFAP farm-level model would provide a more accurate estimate of future economic thresholds of these citrus farms, yet this level of modelling is beyond the scope of this study.

A loss in hectares is associated with a loss in employment opportunities; hence, the increasing negative impact on area under production also means that the number of jobs lost in the industry will increase over time. Under Scenario 1 the estimated number of jobs lost in the citrus industry is projected to reach approximately 9 800 by 2018, which amounts to 7.9% of the current total labour force in the industry. This is an annualized figure, which implies that by 2018 the seasonal impact on labour will be significantly larger at approximately 19 600 workers per season not earning a household income, which represents 16% of the total workforce. Beyond 2018 this impact is expected to be larger as more investment is shifted out of the citrus industry due to the adverse impact on net revenue.

5.3.2. Scenario 2: Impact of imports limited to CBS free regions only

Under the second scenario where regions free of CBS is granted access to the EU, the loss to the industry is expected to be lower compared to Scenario 1. Table 10 shows that exports to the EU are limited to 14.6 million cartons, assuming the citrus fruit produced in CBS-free regions are exported to the EU and USA only. Exports to non-EU markets is projected to increase by 8.9 million cartons and local fresh volume to increase by 0.5 million cartons (equalling a 4% increase in local volumes). About 800 000 cartons is projected not to be produced, leaving 18.2 million cartons or 273 000 tons available for processing. Again considering that excess processing capacity is available for only 150 000 tons, 124 000 tons of fruit will be wasted in the short term.

Table 10: Scenario 2 – Distribution of exports meant for the EU market (million 15kg equivalent cartons)

	Baseline: projected 2014 exports to EU	Scenario 2: Distribution of exports shown in column 2*				
		Exports to EU	Increase in exports to non-EU markets	Increase in local fresh volume	Cartons not produced	Processed/ Other
All citrus	**42.9**	**14.6**	**8.9**	**0.5**	**0.8**	**18.2**
Oranges	29.0	9.3	5.7	0.4	0.6	13.0
Soft Citrus	5.1	3.3	1.2	0.0	0.0	0.5
Grapefruit	5.7	0.4	0.6	0.0	0.1	4.5
Lemons	3.1	1.6	1.3	0.0	0.0	0.2

Source: BFAP

*Numbers may not add up due to rounding

The impact on average returns in the export market will be less severe under Scenario 2 as price premiums earned in the EU markets boost average prices. Average prices are projected around break-even levels for oranges and grapefruit, but above break-even levels for soft citrus and lemons. The decline in prices compared to the Baseline is still substantial, ranging between 14% for lemons and 32% for grapefruit.

Table 11: Scenario 2 – Impact on average export prices for 2014 (Rand per 15kg equivalent carton)

	Baseline	Scenario 2	% change
Oranges	R77	R58	-25%
Soft Citrus	R123	R88	-29%
Grapefruit	R77	R53	-32%
Lemons	R81	R70	-14%

Source: BFAP

As in Scenario 1, prices are projected to recover over time, but are unable to catch-up to Baseline levels (see Table 12). By 2018 the price of grapefruit is projected 31% lower compared to the Baseline price for 2018, the orange price projected 21% lower and the soft citrus price 17% lower. The smallest impact is projected for lemons with a projected 5% decline in the 2018 price compared to the Baseline.

Table 12: Scenario 2 – Impact on average export prices, 2014 to 2018

	Scenario price (Rand per 15kg equivalent carton)					% decline from Baseline price				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Oranges	R58	R61	R65	R69	R74	-25%	-24%	-23%	-22%	-21%
Soft Citrus	R88	R103	R110	R118	R128	-29%	-21%	-20%	-19%	-17%
Grapefruit	R53	R56	R58	R61	R65	-32%	-32%	-32%	-32%	-31%
Lemons	R70	R73	R79	R85	R93	-14%	-13%	-10%	-7%	-5%

Source: BFAP

Table 13 shows that the loss to the industry totals R3.2 billion in 2014, equalling 34% of the value of the industry. Over the next five years the loss increases in absolute nominal terms to R3.7 billion or 30% of the value of the industry. Cumulative this amounts to R17.3 billion over a five year period.

The loss to the orange industry is estimated at R2.2 billion, followed by grapefruit (R533 million), soft citrus (R352 million) and lemons (R161 million). The share of the value of the industry wiped out is the greatest for grapefruit (50%), followed by oranges (35%), soft citrus (32%) and lemons (14%).

Table 13: Scenario 2 – Loss of EU market closure to SA citrus industry (Rand billion)

	2014	2015	2016	2017	2018
Total citrus industry					
Baseline Value of industry	9.366	10.094	10.781	11.491	12.310
Loss of import ban	3.203	3.358	3.448	3.565	3.685
Loss as % of value of industry	34%	33%	32%	31%	30%
Orange industry					
Baseline: Value of industry	6.087	6.567	7.019	7.479	7.999
Loss of import ban (Rand)	2.157	2.309	2.396	2.504	2.618
Loss of import ban (%)	35%	35%	34%	33%	33%
Soft citrus industry					
Baseline: Value of industry	1.099	1.192	1.275	1.359	1.455
Loss of import ban (Rand)	0.352	0.313	0.325	0.330	0.337
Loss of import ban (%)	32%	26%	25%	24%	23%
Grapefruit industry					
Baseline: Value of industry	1.060	1.132	1.189	1.245	1.306
Loss of import ban (Rand)	0.533	0.575	0.588	0.613	0.638
Loss of import ban (%)	50%	51%	49%	49%	49%
Lemon industry					
Baseline: Value of industry	1.121	1.203	1.298	1.408	1.550
Loss of import ban (Rand)	0.161	0.161	0.140	0.118	0.092
Loss of import ban (%)	14%	13%	11%	8%	6%

Source: BFAP

Similar to Scenario 1 the negative impact on the area under production and also on employment is increasing over time. Under Scenario 2, the model projects that by 2018 about 5% of the area under production of citrus fruit will be lost. Based on the projected loss in hectares the estimated number of jobs lost in the citrus industry is projected to reach approximately 6 200 by 2018, equalling roughly 5% of the current total labour force. This is an annualized figure, which implies that the seasonal impact on labour will be significantly larger at approximately 12 400 workers per season not earning a household income. Beyond 2018 this impact is expected to be larger as more investment is shifted out of the citrus industry due to the adverse impact on net revenue.

6. Conclusions

The European Union informed South Africa in 2012 that it considers closing its market to South African citrus due to the presence of citrus black spot. The purpose of this paper is to evaluate the impact on the South African citrus industry should this happen. Considering the importance of the EU market to South African citrus exports, the closure thereof is expected to have far reaching implications for the industry. The expected negative impact is also expected to have ripple effects in the international market, as South Africa is one of the main citrus exporters in the world and particularly in the Southern Hemisphere. South Africa-EU trade accounts for up to 7% of world trade in oranges and 10% of world trade in grapefruit. Moreover, together with Argentina, South Africa is the main soft citrus exporter in the Southern Hemisphere.

Two alternative scenarios are analysed. Scenario 1 considers the case where the EU impose a ban on all citrus fruit produced in South Africa, while Scenario 2 analyses the impact of an import ban only on fruit produced in regions where CBS is present. Under this scenario fruit produced in the Western and Northern Cape and the Free State are granted access to the EU. About 17% of area planted to citrus fruit is located in these regions. In both scenarios it is assumed the import ban comes into effect in 2014 and the impact thereof is measured over a five year period. The direct loss was estimated using a partial equilibrium model developed by BFAP. The main conclusions from the paper can be summarised as follows:

i. The global citrus industry has increased from 2002 to 2012 both in value and to a lesser extent in volume terms. Though the share of the EU in global imports has declined over the past few years, it still accounts for 43% of world imports.
ii. South Africa is the biggest non-EU supplier of oranges, soft citrus and grapefruit imports into the EU.
iii. The gross value of the South African citrus industry is estimated at about R8 billion and the industry provides employment to over 124 500 people. The total wage bill of the citrus industry is estimated at R1.3 billion.
iv. About 42% of South African citrus exports are destined for the EU and this market is valued at almost R3 billion in 2012 for South African citrus.
v. In the event of a complete import ban (Scenario 1), where the EU closes its market to all South African fruit, the projected decline on the average prices of citrus commodities in 2014 ranges between 35% for grapefruit and 54% for soft citrus. The impact on the average export price for oranges and lemons are both 36%. Though the impact declines over the five years analysed, it remains significant.
vi. Under Scenario 1 the estimated loss is measured at R4.7 billion in the first year. That is 50% of the value of the industry will be lost. Over a five year period the cumulative loss will add to almost R26 billion.
x. The supply response of perennial crops is normally very low due to the large capital investment that initially is made and the lifespan of the orchards. In other words, when an industry is in distress, it takes a long period of time for investment to move completely out of the industry as it first has to go through a process of consolidation, finding alternative markets and a relative shift in productivity. This will be even more relevant for the South African citrus industry where the area under production has consistently increased over the past decade, implying a large share of new investments in the industry. The negative impact on the area under production due to declining profitability is increasing over time and will likely be significantly larger beyond the outlook period covered in the project, namely 2014-2018.
vii. A loss in hectares is associated with a loss in employment opportunities; hence, the increasing negative impact on area under production also means that the number of jobs lost in the industry will increase over time. Under Scenario 1 the estimated number of jobs lost per season in the citrus industry is projected to reach approximately 19 600 by 2018, which amounts to 16% of the current total labour force in the industry. This implies that by 201819 600 workers per season will not earn a household income from the citrus industry. Beyond 2018 this impact is expected to be larger as more investment is shifted out of the citrus industry due to the adverse impact on net revenue.

viii. The impact on average export prices under Scenario 2 ranges between 32% for grapefruit and 14% for lemons. The average price for soft citrus and orange exports is simulated at 29 and 25 per cent respectively. As with Scenario 1, the effect is declining over time, but remains significant over a five year time period.

ix. Should the EU closes its market only to fruit produced in CBS infected regions, the financial loss in 2014 is projected to reach R3.2 billion, equalling 34% of the value of the industry. Over a five year period the cumulative effect is estimated at R17.3 billion.

x. Similar to Scenario 1 the negative impact under Scenario 2 on the area under production and also on employment is increasing over time. Under Scenario 2 the estimated number of jobs lost per season in the citrus industry is projected to reach approximately 12 400 by 2018, equalling roughly 10% of the current total labour force. This implies that approximately 12 400 workers per season will not earn a household income in the citrus industry. Beyond 2018 this impact is expected to be larger as more investment is shifted out of the citrus industry due to the adverse impact on net revenue.

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