

# agri benchmark – South African Potato Production in a Global Context

Divan van der Westhuizen (Bureau for Food and Agricultural Policy [BFAB]) & Pieter van Zyl (Potatoes South Africa)

## Background

Farmers across the world are annually faced with new challenges from a production, input and market perspective. Uncertain weather conditions caused some major shifts in supply patterns, with enormous implications on commodity price levels, both internationally and locally. The cost of inputs over the past five years has shifted production to new break-even price or yield levels. Furthermore, drought conditions impacted domestic supply and price levels significantly. Given these fluctuating trends, potato producers are facing similar and other challenges. Increasing cost of fuel, fertiliser, electricity and labour are placing enormous pressure on producers. Additionally, dryland potato producers in the eastern Free State are annually exposed to weather risk and drought conditions. The bottom-line is that **producers should consistently evaluate their production systems and associated costs to determine their relative position and compare it with other producers, both domestically and globally.**

## What is agri benchmark?

**agri benchmark** is a global network of agricultural economists, advisors and farmers. It is commonly managed by the agricultural economics institute of the Thünen Institute in Braunschweig and of the DLG in Frankfurt. In almost 30 participating countries, the network analyses production systems for cereals, rice, oil seeds, sugar beet, potatoes and sugar cane economically. The databases are the respective typical farms in the important production regions.

The **agri benchmark** potato initiative provides a platform to **compare typical potato farms across the globe.** By taking a snapshot of the performance of the farm, producers can evaluate various elements in their production system and cost structures with other producers in South Africa and other countries. An added benefit of such a network is that key agricultural trends are captured and distributed across the network. Typically these trends include mechanisation trends, input related trends, productivity and other information and trends on production systems. The purpose of this article is to evaluate the past production season by benchmarking South African key

results with other countries.

## Result

Figure 1 illustrates the respective yield levels on four typical potato farms across South Africa for the 2011 and 2012 production season. It is further compared with typical potato farms in countries such as Germany, Algeria, France, Poland and the United Kingdom. The South African network currently consists of typical farms in the Eastern Free State (dryland), Limpopo, Sandveld and KwaZulu-Natal (seed production) regions. The graph legend can be explained as follows: The codes refer to typical farms in each country which illustrates the name of the country, the total size of the farm and lastly, the region where the farm is situated.

The figure illustrates that the average irrigation yield in South Africa is approximately 44 tons per hectare. The sample space average (all farms) was 39 tons per hectare in 2012. The dryland average of the farms in Germany, Algeria, France and Poland was 41 tons per hectare. The graph therefore indicates that South African irrigation farmers yield approximately three tons per hectare more than dryland production in Europe and the United Kingdom. However, it is important to consider that these countries have a significant higher annual precipitation and possibly better soil conditions. Dryland potato production on the German typical farms follows a winter wheat/sugar beet/winter wheat/potato rotation system. They mainly use an intensive tillage system with prevailing conventional ploughing or deep soil cultivation. The United Kingdom farm follows a direct seeding approach whereas the Polish farm has a standard rotation with maize before potato production. The majority of the typical farms produce for the table or fresh potato market. Domestically, yield levels in all regions have declined from 2011 to 2012. Dryland potato production on the Eastern Free State typical farm has decreased by four tons per hectare, Limpopo by three tons per hectare and Sandveld by six tons per hectare.

The average farm gate price levels are illustrated in Figure 2. It should be noted that farmers in South Africa function in a different supply chain framework where the producer

Figure 1: Yield in ton per hectare

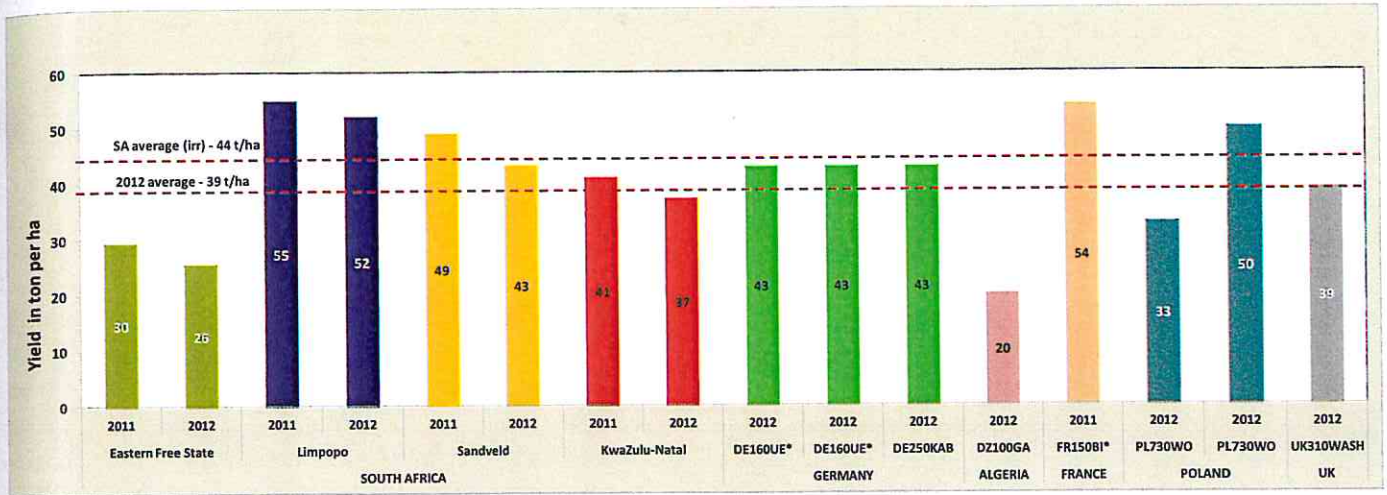
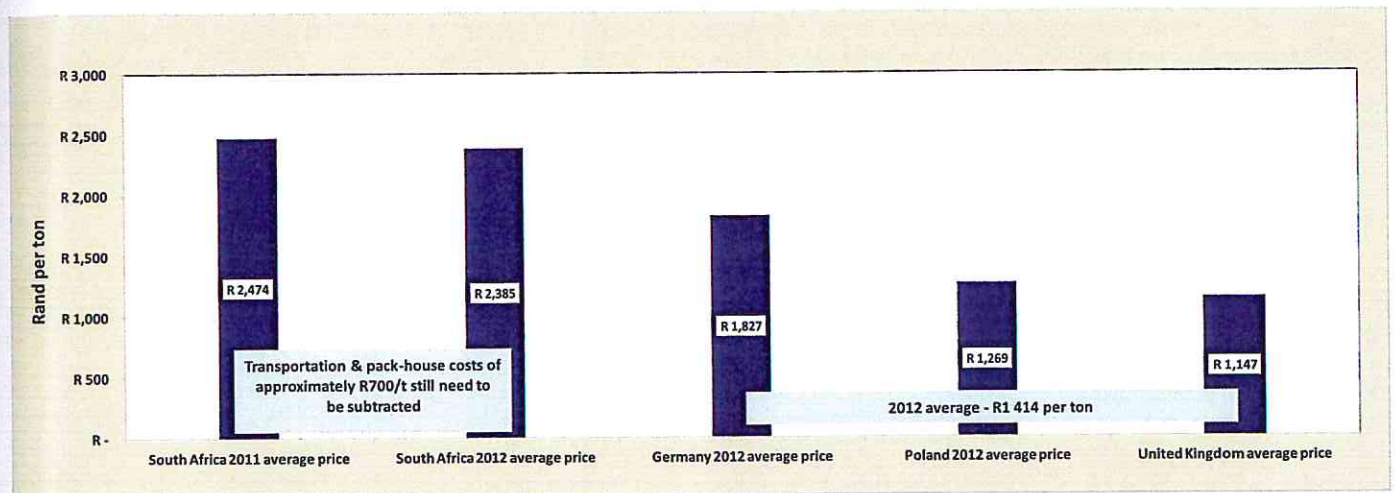


Figure 2: Potato farm gate price comparison (R/ton)



packs his potatoes in his own pack house. Potatoes are then transported at his own costs to the markets, except when buyers buy his produce on his farm. The bulk of table potatoes in South Africa are sold on the national fresh produce markets. In the United Kingdom and Europe, potatoes are mainly sold in bulk directly from the farm and the buyer pays for transport. Thus, farm gate prices between South Africa and the Northern Hemisphere will differ in the sense that farmers in South Africa normally incur the cost of packaging and transportation. Therefore, the figure illustrates the value-adding benefit and difference between supplying to a fresh produce market and directly to packers and wholesalers in bulk.

Figure 2 illustrates that the average potato farm gate price (market commission has been deducted, but not transportation) in South Africa has decreased by 3.6% from 2011 to 2012. This is a reduction of R89 per ton. The reported farm gate price in 2012 was approximately R2 385 per ton or R23.85 per 10 kg bag. If one wants to compare "apples with apples", the cost of transportation and pack house

costs should be subtracted from the South African farm gate prices illustrated in the figure. Only then can the local farm gate price be compared with the Europeans. The average estimated costs of transportation and pack house costs are close to R7 per 10 kg bag which provides an adjusted farm gate price of R16.85 per 10 kg bag or R1 685 per ton (R23.85/10 kg bag minus R7/10 kg bag). The average price realised on typical farms in Germany, Poland and the United Kingdom in 2012 was R1 414 per ton (the price producers received for their potatoes on the field in bulk and already loaded on a truck). Thus, the average realised price in South Africa is higher when compared to the typical farms in Poland and the United Kingdom. The average farm gate prices in Germany and the United Kingdom was R1 827 and R1 147 per ton respectively. In Poland an average price of R1 269 per ton was reported.

Nitrogen, phosphate and potassium application rates are presented in Figure 3. The left axis illustrates the application rate in kilogram per hectare and the right axis the cost of fertiliser in the respective countries (rand per hectare).

Figure 3: N, P & K application rates

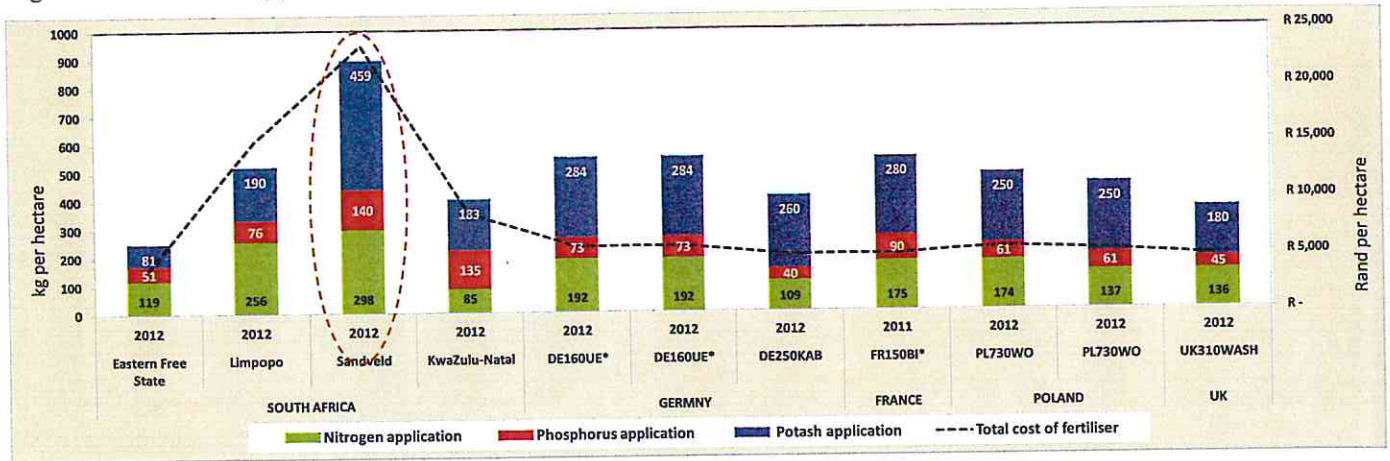


Figure 4: Nitrogen productivity (kg yield per 1 kg N applied)

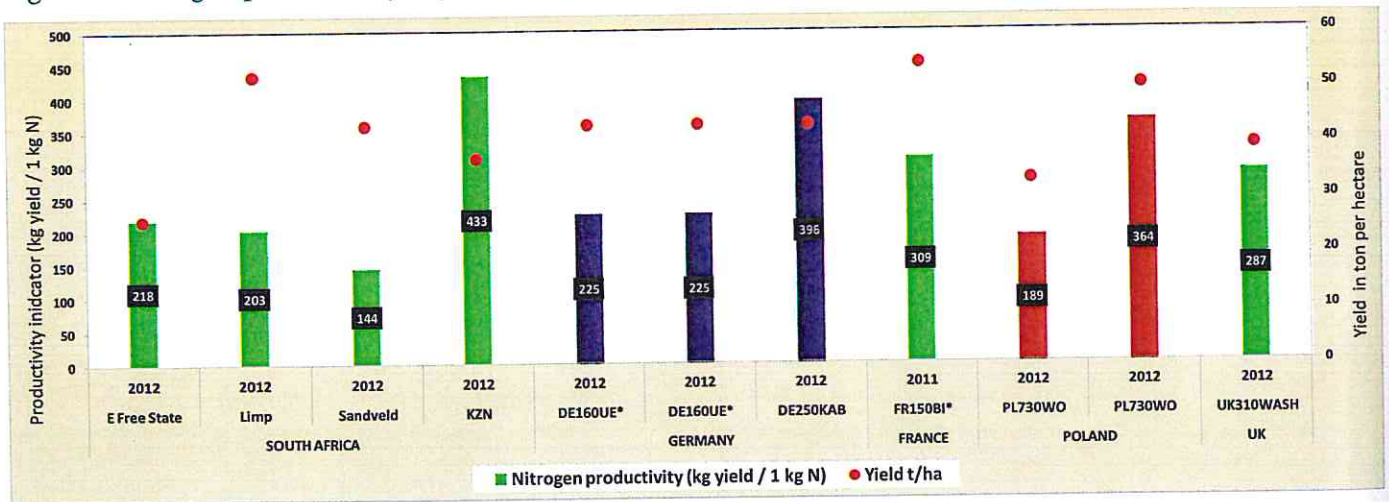
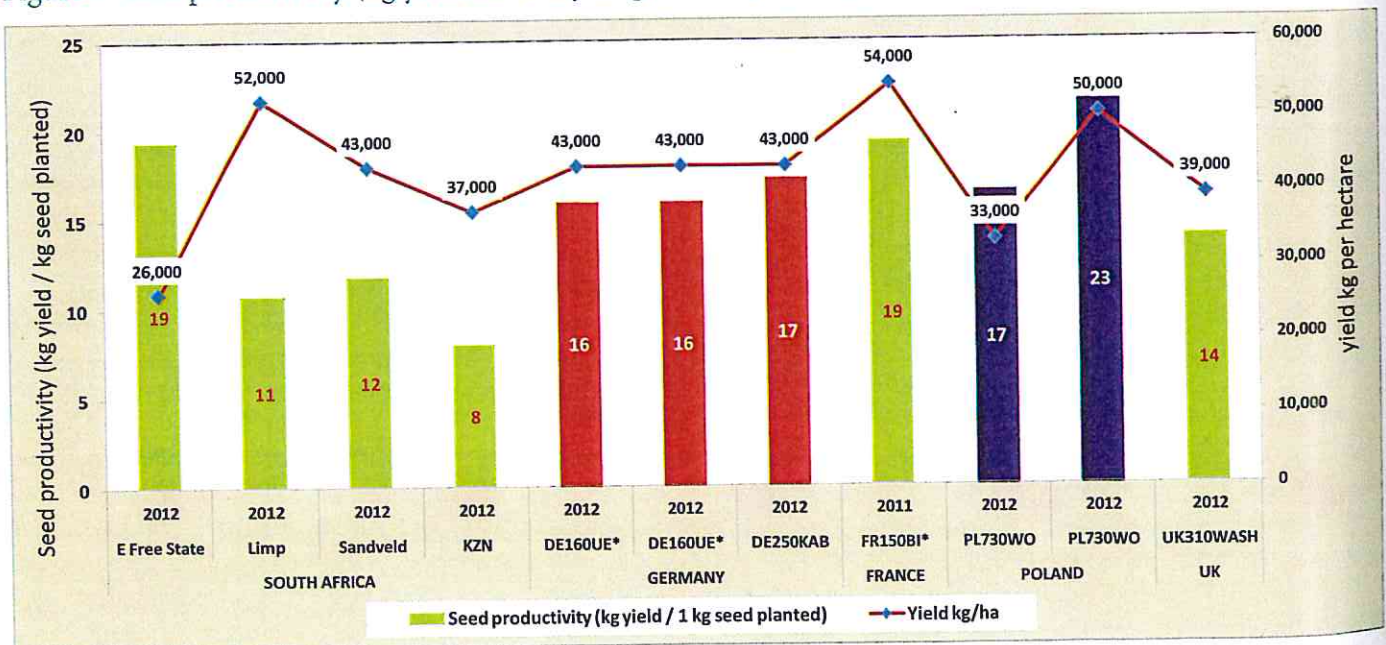


Figure 5: Seed productivity (kg yield for every 1 kg of seed planted)



The exchange rate assumption was set at R8.70 to the US dollar. The most prominent observation that can be made is that due to soil types in the Sandveld region, their application rates are significantly higher than any other typical farm across the sample space. On average, Sandveld producers spend about R23 600 per hectare annually on fertilisers. In 2012, 298 kilogram of nitrogen was applied per hectare, nearly 42 kilograms more than on the Limpopo irrigation farm. Similarly, potash application was 459 kilograms, which is 269 kilograms more than in Limpopo.

The Eastern Free State dryland farm applies 119 kilograms of nitrogen, 51 kilogram of phosphorus and 81 kilogram of potash per hectare. The irrigation average of nitrogen application on the South African sample farms in 2012 was 277 kilograms per hectare. Dryland potato farms in Germany, Poland and the United Kingdom applied in the region of 160 kilograms of nitrogen per hectare. The graph further illustrates that the Sandveld and KwaZulu-Natal production regions apply 75 kilograms of phosphorus more than the German, Polish and United Kingdom farms. The average application rate of potash in the last mentioned countries was 255 kilogram per hectare.

Given these application rates, it is important to consider productivity indicators, thus convey yield levels into the equation of application rates. A typical productivity indicator that can be used as a type of response rate is nitrogen productivity. Figure 4 illustrates the nitrogen productivity indicators. The graph illustrates the amount of yield that was obtained for every kilogram of nitrogen applied.

The typical farm in KwaZulu-Natal realised the highest nitrogen productivity, followed by the 250 hectare German farm. On average, the KwaZulu-Natal farm yielded 433 kilograms of potatoes for every one kilogram of nitrogen applied. Similarly, the German farm yielded 396 kilogram of potatoes. The Sandveld region with high associated energy cost and application rates yielded only 144 kilograms of potatoes for every kilogram of nitrogen applied. The Eastern Free State and Limpopo regions yielded 218 and 203 kilograms respectively. The sample space average of foreign countries was 285 kilograms of potatoes where South Africa reported an average of 250 kilograms of potatoes (all farms).

The typical farms' seed productivity is illustrated in Figure 5 with kilogram yield per one kilogram of seed planted per hectare on the left axis and yield per hectare on the right.

The Eastern Free State dryland typical farm performed the best in South Africa with a productivity rate of 19 kilogram of potatoes yielded for every kilogram seed planted per hectare. The Polish farm performed the best in the sample

space with a productivity rate of 23 kilograms of potatoes. Typical farms in Limpopo, Sandveld and KwaZulu-Natal reported rates of 11 kilograms, 12 kilograms and 8 kilograms respectively. The sample average for South African farms was 12 kilogram of potatoes for every kilogram seed planted. The average of European countries and the United Kingdom countries was 17 kilogram of potatoes.

### Conclusion

The general observation that can be made is that South African typical farms performed relatively well when compared to typical farms in Germany, Poland and the United Kingdom. Secondly, from a price perspective, South African farm gate prices are higher than selective Northern Hemisphere countries. Irrigation yield levels in South Africa outperformed the sample space average. A risk, especially in an environment with fluctuation oil and fertiliser prices, exists in the Sandveld production system and cost structure when considering high energy costs. The high application rates of fertiliser have a significant impact on the cost structure of these farms. In addition, this causes productivity indicators to drop substantially and the question really arises whether these patterns are sustainable. ©



## IVANHOE SEED POTATOES

IVANHOE FARMING COMPANY (PTY) LTD

P.O. Box 23, Nottingham Road 3280

Phone 033 266 6052

Fax 033 266 6054

[ivanhoefarming@bundunet.com](mailto:ivanhoefarming@bundunet.com)